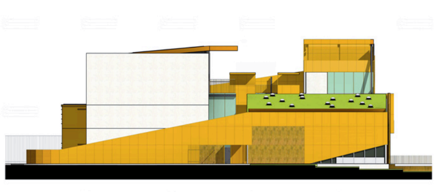
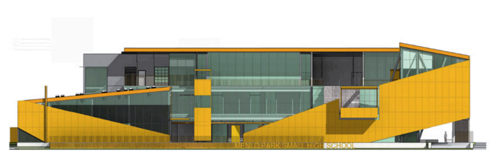
Sequoia Union High School District
Menlo Park Small High School Project

Draft Environmental Impact Report - Vol. 2

SCH# 2016022066





July 2016

SUHSD

Sequoia Union High School District
480 James Avenue
Redwood City, CA 94062

Sequoia Union High School District
Menlo Park Small High School Project

Draft Environmental Impact Report - Vol. 2

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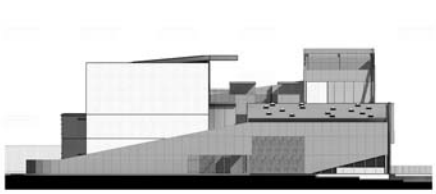

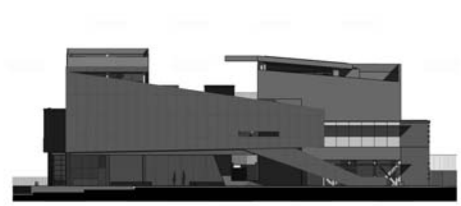

July 2016

SUHSD

Sequoia Union High School District
480 James Avenue
Redwood City, CA 94062

DRAFT EIR VOLUME 2

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- February 19, 2016 Notice of Preparation (NOP)
- NOP Distribution List
- Written Comments Received on the NOP

APPENDIX B Geologic and Geotechnical Site Evaluations
- March 23, 2016 Geotechnical Investigation and Geologic Hazards Evaluation

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APPENDIX A:

EIR SCOPING DOCUMENTS

- February 19, 2016 Notice of Preparation (NOP)
- NOP Distribution List
- Written Comments Received on the NOP

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR THE SEQUOIA UNION HIGH SCHOOL DISTRICT MENLO PARK SMALL HIGH SCHOOL PROJECT

Date: February 19, 2016

To: California State Clearinghouse, Ccalifornia Environmental Quality Act (CEQA) responsible and trustee agencies, federal agencies, San Mateo County Clerk, and interested individuals and organizations

Subject: **Notice of Preparation for the Menlo Park Small High School Project Environmental Impact Report (EIR)**

Lead Agency: Sequoia Union High School District - 480 James Avenue, Redwood City, CA 94062

Applicant: Same as Lead Agency

Project Location: 150 Jefferson Drive, Menlo Park, CA 94025

Project Description: A brief description of the project, including its location and probable environmental effects, is attached. An Initial Study was not prepared for the project because the Sequoia Union High School District (SUHSD) has determined that an EIR will be prepared for the project.

The purpose of this Notice of Preparation (NOP) is to request comments on the scope and content of the environmental review the SUHSD will conduct on its Menlo Park Small High School Project from state responsible and trustee agencies, federal agencies, and any other person or organization concerned with the environmental effects of the project. Pursuant to CEQA Guidelines §15082 (b), the SUHSD is providing a 30-day period to respond to this NOP. **Please send your written response by the earliest possible date, but no later than 5 PM on March 25, 2016 to Mr. Matthew Zito, Chief Facilities Officer, 480 James Avenue, Redwood City, CA 94062 or to smallhighschool-eir@seq.org (enter "Menlo Park Small High School NOP" in the 'Subject' line).** Agency responses should include the name of a contact person at the agency. Project information, including this NOP, is available on the SUHSD's website: www.seq.org.

Signature: Matthew S. Zito Date: 02/19/16

Title: Chief Facilities Officer

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MENLO PARK SMALL HIGH SCHOOL PROJECT

PROJECT DESCRIPTION

The SUHSD is a grade 9 – 12 school district comprised of four comprehensive high schools, a model continuation high school, other specialized programs and services, and four charter schools. The SUHSD currently serves approximately 8,640 students in total; however, demographic forecasts completed in January 2016 indicate that student enrollment in the SUHSD is likely to reach a minimum of approximately 9,200 students by 2020. In light of this projected growth, the SUHSD recently added new classrooms and facilities to existing high school campuses and has acquired property for development of a new, small high school in the northern part of the City of Menlo Park in San Mateo County (see Figure 1).

Project Location and Site Description

The proposed high school would be located at 150 Jefferson Drive in the City of Menlo Park (37°28’56” north latitude and 122°10’26” west longitude). The project site is an approximate 2.1 acre parcel of developed land (Assessor’s Parcel Number 055-243-030) within an area of Menlo Park that is transitioning from 1960’s and 1970’s industrial / warehouse land uses to newer, corporate campuses and mixed biotechnology, commercial, office, and other land uses. The existing industrial / warehouse area is generally bordered by Bayfront Expressway (State Route 84) on the north, the Dumbarton rail corridor on the east, U.S. Highway 101 on the south, and Marsh Road on the west. Access to the area is limited by these major roadways and features (see Figure 2). The proposed school site currently contains an approximately 44,000 square-foot building that is the corporate headquarters and sales office for a cable and cable assemblies business (Bay Associates Wireless Technologies). The site also includes parking and landscaping areas. In general, 150 Jefferson Drive is surrounded by commercial and warehouse properties, some of which are vacant, on Constitution Drive (north of the site), Independence Drive and Chrysler Drive (west of the site), and Commonwealth Drive (south of the site; see Figure 2). The City of Menlo Park’s Belle Haven neighborhood is approximately 0.4 miles southeast of the site (across the Dumbarton rail corridor) and the City’s Suburban Park / Lorelei Manor/ Flood Park neighborhood is approximately 0.2 miles south of the site (across Highway 101; see Figure 2).

Preliminary site investigations at 150 Jefferson Drive have identified chemicals of potential concern (petroleum hydrocarbons and volatile organic compunds) in soil, subsurface soil vapor, and/or ground water samples collected at the site that require further evaluation. On October 29, 2015, the SUHSD and the California Department of Toxic Substances Control (DTSC) Schools Division entered into an Environmental Oversight Agreement related to preparation of a Preliminary Environmental Assessment (PEA) report (DTSC Site Code 204273; Envirostor ID 60002163). The SUHSD will be submitting a draft PEA report to DTSC for review and will make the document available for public comment as part of the PEA process. If required by DTSC, SUHSD will perform additional site investigation and/or remedial measures under DTSC oversight. The EIR will present information on the PEA report and any additional completed site investigations, as well as information on potential remedial activities (if necessary).

Project Components

The proposed project is intended to alleviate increases in the SUHSD's existing and projected student enrollment, and is planned to be operational in time for the 2018-19 school year.

The project would demolish and replace the existing facilities at 150 Jefferson Drive with a new small high school with capacity for 400 students and 35 faculty and staff. The SUHSD would also make other improvements to existing site parking and landscaping areas and site utilities / utility connections. The new high school building would be a three-story building containing approximately 40,000 gross square feet of building space (see Figure 3). The conceptual site plan also includes an outdoor learning amphitheater (fronting Jefferson Drive). Student loading an unloading would occur primarily on the interior of the site, off of Jefferson Drive. The conceptual site plan also includes bicycle racks and on-site parking spaces distributed along the site's southern and western perimeter. The SUHSD anticipates the school would be in session from approximately 8:15 or 8:30 AM to 3:30 or 3:45 PM during the traditional school year, with summer school offerings as well.

Due to the project's location near Facebook and other technology company campuses, as well as the outcome of parent and student surveys, the SUHSD anticipates the new school's curriculum could include Career Technical Education (CTE) classes, linked learking, and academic content focused on technology, design, and engineering skills in order to prepare students for pursuing both college enrollment and professional careers. Accordingly, the proposed building will house learning studios, science, technology, engineer, and mathematics (STEM) labs, administration offices, conference rooms, a workroom, food service, and a student center/dining area. The new building will feature exhibition and collaborative spaces, as well as flexible common spaces that serve more than one purpose.

As part of the project, the SUHSD may enter into a partnership with the San Mateo County Community College District (SMCCCD) with the the goal to round out the offering of content-specific high school courses that will provide students with the practical and theoretical knowledge to apply to work-based learning environments. The SMCCCD may also use the high school to provide community college courses several nights a week.

The new school would be open to all SUHSD students; however the SUHSD anticipates the school would primarily serve students from the southern part of the SUSHD (i.e., Redwood City, Menlo Park, and East Palo Alto). Construction is anticipated to begin in the first quarter of 2017, with the target date for opening the new school set for August 2018. Initial enrollment in 2018 is anticipated to be approximately 100 students, with the school reaching full capacity by the 2021-22 school year (i.e., when the initial freshman class of 2018 will be seniors).

Probable Environmental Effects

The Menlo Park Small High School Project is intended to support the forecasted increase in student enrollment within the SUHSD and would result in the demolition of existing commercial facilities and the construction of new school facilities. The SUHSD is preparing an EIR for its proposed Menlo Park Small High School Project because the project may have the potential to result in one or more significant environmental effects, including potential effects on and/or from, but not limited to, hazards and hazardous materials and traffic.

Demolition and construction activities would occur at an existing developed land parcel that contains no agricultural, forestry, or mineral resource lands, and the forecast in enrollment growth throughout the SUHSD is based, in part, on regional population growth and existing enrollment at elementary schools that feed into the SUHSD; enrollment growth in the SUHSD is not a result of the project itself. Accordingly, the project would not result in significant environmental effects to agricultural and forestry resources, mineral resources, population and housing, or recreational facilities.

Traffic Impact Analysis

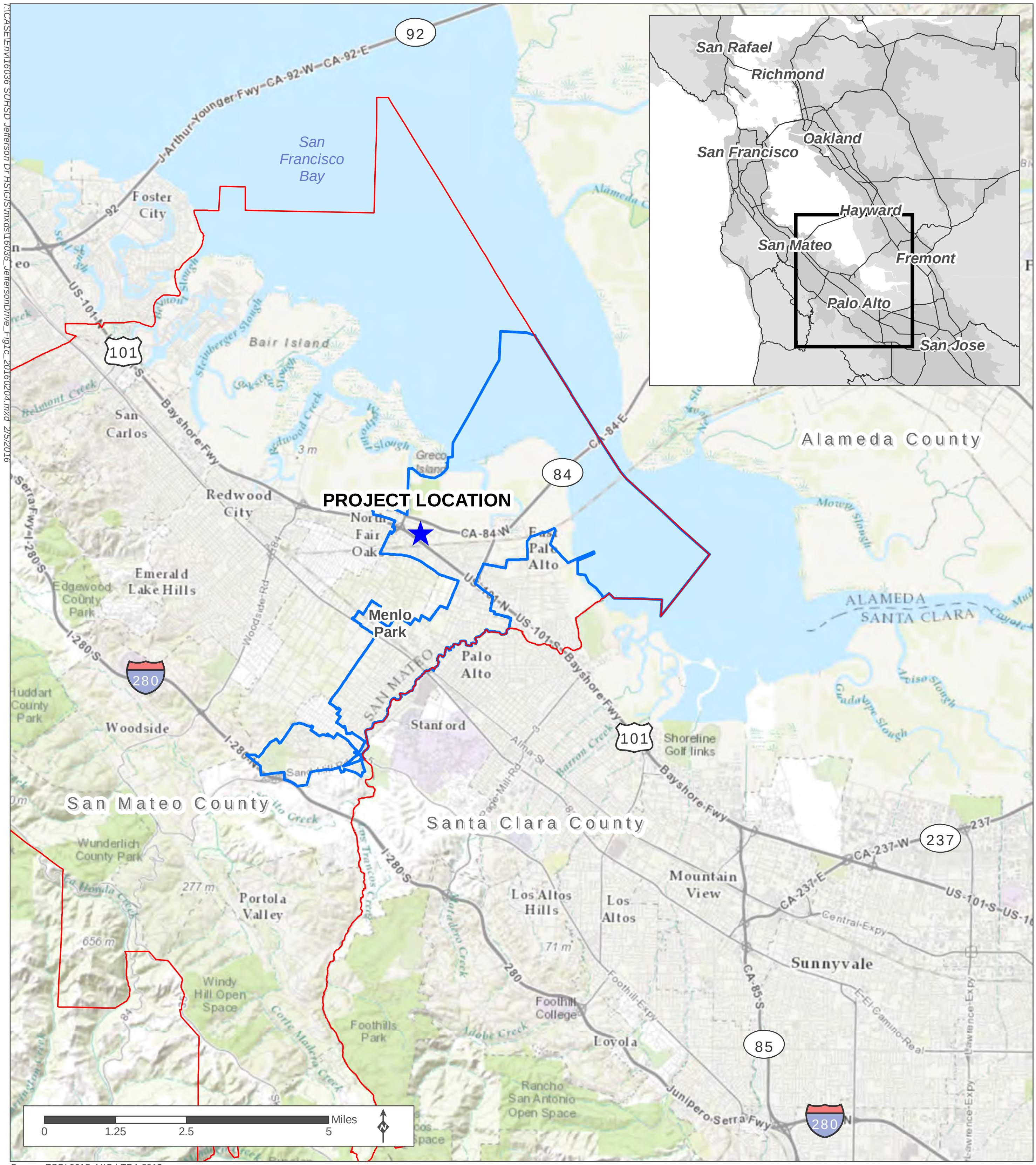
The EIR will present the findings of a Traffic Impact Analysis (TIA) report prepared for the project by a qualified transportation engineering firm. The purpose of the traffic analysis is to satisfy the requirements of the City of Menlo Park, the City/County Association of Governments (C/CAG) of San Mateo County, and the requirements of CEQA. The study will determine the traffic impacts of the proposed school project on the key intersections in the vicinity of the site during the weekday AM and PM peak hours of adjacent street traffic (7-9 AM and 4-6 PM, respectively), which would coincide with the school peak hours. In addition, the SUHSD anticipates a freeway analysis will not be required for the project since the project is not anticipated to add traffic to the adjacent freeway segments representing one percent (1%) or more of the freeway's capapacity; however, study intersections would include the Highway 101 on-ramps (northbound and southbound) at Marsh Road. The EIR's analysis of traffic issues would also consider related issues, such as student drop-off/pick-up activities, and parking supply as appropriate.

The TIA would rely upon recent turning movement counts provided by the appropriate jurisdictional agency and/or collect new turning movement counts as needed. The distribution and assignment of the project trips will be based on a potential school attendance pattern developed from a similar small high school within the SUHSD, as well as projected school service area information, the assumptions used in the City of Menlo Park's TIA Guidelines, the prevailing travel patterns on the adjacent roadway network, abutting land uses, travel time characteristics and knowledge of the study area.

The TIA will analyze the following scenarios:

1. Existing Conditions
2. Existing + Project Conditions
3. Background Conditions (existing conditions + approved project trips)
4. Project Conditions
5. Cumulative Conditions
6. Cumulative + Project Conditions

The TIA and the EIR will also discuss: trip generation and distribution; study intersection traffic analysis; study analysis periods and methodology; arterial and collector streets assessment; site plan and parking evaluation; pedestrian, bicycle, and transit conditions; planned transportation improvements; and mitigation measures, as necessary. The TIA would be provided as an appendix to the EIR.



Source: ESRI 2015; MIG | TRA 2015

Project location

Sequoia Union High School District

Menlo Park city boundary

I:CASE\Env\16036 SUHSD Jefferson Dr\GIS\mxds\16036_JeffersonDrive_Fig1C_20160204.mxd 2/5/2016

MIG | TRA ENVIRONMENTAL SCIENCES

Figure 1 Project Location

Menlo Park Small High School Project NOP

Source: ESRI 2016, MIG|TRA 2016

- Rail line
- Project boundary
- City boundaries

Figure 2 Project Site Aerial

Menlo Park Small High School Project NOP

MIG | TRA ENVIRONMENTAL SCIENCES

Figure 3 Conceptual Site Plan

Menlo Park Small High School Project NOP

SEQUOIA UNION HIGH SCHOOL DISTRICT
NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR THE MENLO PARK SMALL HIGH SCHOOL PROJECT

DISTRIBUTION LIST - FEBRUARY 2016

The following agencies and interested parties receive a copy of the Notice of Preparation of an Environmental Impact Report for the Sequoia Union High School District's Menlo Park Small High School project.

CEQA State Responsible and Trustee Agencies (To be sent by the State Clearinghouse / MUSD):	**Materials Distributed**
Governor's Office of Planning and Research State Clearinghouse 1400 Tenth Street Sacramento, CA 95814 The State Clearinghouse will send copies to the following state agencies: • Air Resources Board • Department of Education • Department of Fish and Wildlife (Region 3) • Department of Transportation (District 4) • Native American Heritage Commission • Office of Historic Preservation • Office of Public School Construction • Regional Water Quality Control Board #2 (San Francisco Bay) • Department of Water Resources	Notice of Completion Notice of Preparation (15 copies)
The SUHSD sent copies to the following state agencies: • Department of Toxic Substances Control Sacramento Field Office 8800 Cal Center Drive Sacramento, CA 95826 Attn: Harold "Bud" Duke	Notice of Preparation

Local Responsible Agencies (To be sent by the Sequoia Union High School District):	**Materials Distributed**
City of Menlo Park Community Development Department 701 Laurel Street Menlo Park, CA 94025	Notice of Preparation
City of Menlo Park Public Works Department ATTN: Nikki Nagaya 701 Laurel Street Menlo Park, CA 94025	Notice of Preparation
Bay Area Air Quality Management District Planning and Research, Air Quality Planning 939 Ellis Street San Francisco, CA 94109	Notice of Preparation

Federal Agencies (To be sent by the Sequoia Union High School District):	**Materials Distributed**
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US Fish and Wildlife Service San Francisco Bay-Delta Fish and Wildlife 650 Capitol Mall, Suite 8-300 Sacramento, CA 95814	Notice of Preparation

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San Mateo County Clerk-Recorder's Office 555 County Center, 1st Floor Redwood City, CA 94063	Notice of Preparation

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Menlo Park Municipal Water District 701 Laurel Street Menlo Park, CA 94025	Notice of Preparation
City of Redwood City Community Development Department 1017 Middlefield Road Redwood City, CA 94063	Notice of Preparation
Town of Atherton Planning Department 91 Ashfield Road Atherton, CA 94027	Notice of Preparation
City of East Palo Alto Planning and Housing Division 1960 Tate Street East Palo Alto, CA 94303	Notice of Preparation
County of San Mateo Planning and Building Department 455 County Center, 2nd Floor Redwood City, CA 94063	Notice of Preparation
City/County Association of Governments San Mateo County Transportation – Congestion Management 555 County Center – 5th Floor Redwood City, CA 94063	Notice of Preparation

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Mr. Jamillah Moore Vice Chancellor for Education Services San Mateo Community College District 3401 CSM Drive San Mateo, CA 94402	Notice of Preparation
Mr. Robert Shoffner Business and Technology Faculty San Mateo Community College District 3401 CSM Drive San Mateo, CA 94402	Notice of Preparation
Brian Perkins Aide to Congresswoman Jackie Speier 155 Bovet Rd, Suite 780 San Mateo, CA 94402	Notice of Preparation
Councilwoman Kristin Keith City Council of Menlo Park 155 Bovet Rd, Suite 780 San Mateo, CA 94402	Notice of Preparation
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DEPARTMENT OF TRANSPORTATION
DISTRICT 4
P.O. BOX 23660, MS-10D
OAKLAND, CA 94623-0660
PHONE (510) 286-5528
FAX (510) 286-5559
TTY 711
http://www.dot.ca.gov/dist4/

Serious Drought.
Help save water!

February 29, 2016

SMVar039
SCH# 2016022066

Mr. Matthew Zito
Sequoia Union High School District
480 James Avenue
Redwood City, CA 94062

Dear Mr. Zito:

Menlo Park Small High School Project APN 055-243-030 – Notice of Preparation

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the project referenced above. The mission of Caltrans is to provide a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability. We seek to reduce statewide Vehicle Miles Travelled (VMT) and increase non-auto modes of active transportation. The Local Development – Intergovernmental Review Program reviews land use projects and plans to ensure consistency with our mission and State planning priorities of conservation, efficient development, and infill. To ensure a safe and efficient transportation system, we encourage early consultation and coordination with local jurisdictions and project proponents on all development projects that utilize the multi-modal transportation network. We provide these comments to promote the State's smart mobility goals that support a vibrant economy, build active and livable communities, and responsibly manage California's transportation-related assets.

Project Understanding

The project proposes the construction of a new small high school located at 150 Jefferson Drive in the City of Menlo Park (City). This area of the City is transitioning from industrial/warehouse land uses to newer, corporate campuses and mixed biotechnology, commercial, office, and other land uses. Currently the site is surrounded by commercial and warehouse properties, some of which are vacant. The Belle Haven residential neighborhood is approximately 0.4 miles from the site across the Dumbarton rail corridor and the Suburban Park/Lorelei Manor/Flood Park neighborhood is approximately 0.2 miles from the site across US Highway 101.

The project would demolish and replace the existing facilities with a new small high school with a capacity for 400 students, 35 faculty and staff. The school would serve students primarily from the southern part of the school district including Redwood City, East Palo Alto, and Menlo Park.

Mitigation Responsibility
As the lead agency, the City is responsible for all project mitigation, including any needed improvements to State highways. The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures. This information should also be presented in the Mitigation Monitoring Reporting Plan of the environmental document.

Traffic Impact Study
The environmental document should include an analysis of the travel demand expected from the proposed project including construction traffic. Early collaboration, such as submitting the traffic impact study (TIS) prior to the environmental document, leads to better outcomes for all stakeholders. We recommend using the Caltrans *Guide for the Preparation of Traffic Impact Studies* (TIS Guide) for determining which scenarios and methodologies to use in the analysis. The TIS Guide is available at the following link:
http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf.

We recommend that a freeway analysis be included as part of the TIS including freeway segments of US-101, State Routes (SR) 84, 82, 109, and 114 as well as the corresponding ramps.

In addition to the methodology referenced above, please analyze impacts on pedestrians and bicyclists resulting from projected vehicle miles traveled (VMT) increases. The analysis should describe any pedestrian and bicycle mitigation measures and safety countermeasures needed to maintain and improve access to transit facilities and reduce vehicle trips.

Mitigation for any roadway section or intersection with increasing VMT needs to be identified. Mitigation may include contributions to fee programs as applicable, and should support the use of transit and active transportation mode.

As soon as they are available, please forward at least one hard copy and one CD of the environmental document and technical appendices. Please feel free to call or email Sandra Finegan at (510) 622-1644 or sandra.finegan@dot.ca.gov with any questions regarding this letter.

Sincerely,

for PATRICIA MAURICE
District Branch Chief
Local Development – Intergovernmental Review

c: State Clearinghouse

STATE OF CALIFORNIA Edmund G. Brown Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone (916) 373-3710
Fax (916) 373-5471
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

February 29, 2016

Matthew Zito
Sequoia Union High School District
480 James Avenue
Redwood City, CA 94062

RE: SCH#2016022066, Menlo Park Small High School Project, San Mateo County

Dear Mr. Zito:

The Native American Heritage Commission has received the Notice of Preparation (NOP) for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, § 15064.5 (b) (CEQA Guidelines Section 15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared. (Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd.(a)(1) (CEQA Guidelines § 15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code § 21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code § 21084.3 (a)). **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. § 800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments. **Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.**

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

a. A brief description of the project.
b. The lead agency contact information.
c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code § 21080.3.1 (d)).
d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code § 21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code § 21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or environmental impact report. (Pub. Resources Code § 21080.3.1(b)).
   a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18). (Pub. Resources Code § 21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
   a. Alternatives to the project.
   b. Recommended mitigation measures.
   c. Significant effects. (Pub. Resources Code § 21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
   a. Type of environmental review necessary.
   b. Significance of the tribal cultural resources.
   c. Significance of the project's impacts on tribal cultural resources.
   d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code § 21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code § 21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
   a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
   b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code § 21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
   a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
   b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code § 21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation

monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code § 21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code section 21084.3 (b). (Pub. Resources Code § 21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
        i. Planning and construction to avoid the resources and protect the cultural and natural context.
        ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
        i. Protecting the cultural character and integrity of the resource.
        ii. Protecting the traditional use of the resource.
        iii. Protecting the confidentiality of the resource.
    c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    d. Protecting the resource. (Pub. Resource Code § 21084.3 (b)).
    e. Please note that a federally recognized California Native American tribe or a nonfederally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code § 815.3 (c)).
    f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code § 5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An environmental impact report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code section 21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code § 21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code § 65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code § 65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code section 65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code sections 5097.9 and 5097.993 that are within the city's or county's jurisdiction. (Gov. Code § 65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have been already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
    a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
    b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
    a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
    b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
    c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions, please contact me at my email address: sharaya.souza@nahc.ca.gov.

Sincerely,

Sharaya Souza

Sharaya Souza
Staff Services Analyst
cc: State Clearinghouse

WEST BAY
SANITARY DISTRICT

Serving Our Community Since 1902

500 Laurel Street, Menlo Park, California 94025-3486 (650) 321-0384 (650)321-4265 FAX

PHIL SCOTT
District Manager

In reply, please refer to our
File No. 055-243-030

March 2, 2016

VIA EMAIL: smallhighschool-eir@seq.org

Matthew Zito
Chief Facilities Officer
Sequoia Union High School District
480 James Avenue
Redwood City, CA 94062

RE: 150 JEFFERSON DRIVE, MENLO PARK, CA 94025
MENLO PARK SMALL HIGH SCHOOL NOTICE OF PREPARATION
APN: 055-243-030

Dear Mr. Zito:

In response to the Notice of Preparation (NOP) for the Menlo Park Small High School Project Environmental Impact Report (EIR), the West Bay Sanitary District (WBSD) has the following comments:

- Due to the predicted increase in the number of occupants for this parcel, the respective sewer main that will collect sewer discharge from the newly constructed building will need to be upsized. Currently, there are 8" sewer mains on both the south and north sides of the property; one main being on Jefferson Drive and the other in the easement on the south side of the parcel. Regardless of which sewer main is selected to discharge into, the selected 8" sewer main will need to be replaced with 10" sewer piping up to the intersection of Jefferson Drive and Chrysler Drive.
- This EIR should cover and include all information related to the construction of the upsized pipe.

If you have any questions, please call me at (650) 321-0384. A field-meet could be beneficial as well to confirm pipe locations.

Very truly yours,

WEST BAY SANITARY DISTRICT

Adam Slusser
Engineering Technician

cc: BHK, SXR, TMR, CJN, PYD

W:\Public Data\Adam\PLAN REVIEW\SEQUOIA UNION HIGHS SCHOOL DISTRICT _SUHSD\WBSD Notice Of Preparation Response For EIR_ADS Ltr 03-02-16.Docx

S J AMOROSO

PROPERTIES CO.

Via FedEx

February 29, 2016

Mr. Matthew Zito
Chief Facilities Officer
480 James Avenue
Redwood City, CA 94025

Re: Proposed Menlo Park Small High School Project
150 Jefferson Drive, Menlo Park, CA

Dear Mr. Zito:

We are in receipt of your Notice of Preparation of an Environmental Impact Report for the referenced proposed project. The property we own is at 135 Commonwealth Dr., Menlo Park.

After review, my initial concern has to do with the parking shown on the attached drawing. Surface parking for 400 students, 35 faculty and staff, and visitor parking, appears to be wholly inadequate.

As more information is provided in the EIR we will comment if we have other concerns.

Sincerely,

S. J. AMOROSO PROPERTIES CO.

Gilbert J. Amoroso
President

390 Bridge Parkway Redwood Shores CA 94065 Tel 650 654 1900 Fax 650 591 3631

Phillip Gleason

From: Chris Dugan
Sent: Thursday, March 24, 2016 12:21 PM
To: Phillip Gleason
Subject: FW: Menlo Park small high school NOP

Please .pdf and save to T:

Thanks, Phil.

From: Rosa Miralles [mailto:rmiralles@seq.org]
Sent: Thursday, March 24, 2016 11:30 AM
To: Chris Dugan
Subject: Fwd: Menlo Park small high school NOP

Rosa Miralles
Assistant to Matthew Zito
Chief Facilities Officer
Sequoia Union High School District
(650) 369-1411 Ext. 22356

---------- Forwarded message ----------
From: **Matthew Zito** <mzito@seq.org>
Date: Thu, Mar 24, 2016 at 11:12 AM
Subject: Fwd: Menlo Park small high school NOP
To: Rosa Miralles <rmiralles@seq.org>

Please forward to Chris

Begin forwarded message:

> **From:** Calvin Fong <Calvin.Fong@infoimageinc.com>
> **Date:** March 23, 2016 at 11:39:58 PM PDT
> **To:** "mzito@seq.org" <mzito@seq.org>
> **Cc:** Calvin Fong <Calvin.Fong@infoimageinc.com>
> **Subject: Menlo Park small high school NOP**
>
> My property and business operations location: 141 Jefferson drive and 172 Constitution drive.
>
> Concerns to the project at 150 Jefferson Drive

1. Policing of student and non student potential disturbance, loitering and vandalism impacting conducting business operations and meetings.

2. Traffic congestion and parking violations

3. My property occupy two streets, vehicle will short cut into Constitution and exit to Jefferson or vice versa. This have been control and manageable with the current business neighbor, but with the school students incoming of traffic my property and parking lot activity will increase with this problem, liability, policing and illegal parking.

Calvin Fong

Property owner

V.P Operations

InfoIMAGE, Inc.

650-473-6388

Exponent

Exponent
149 Commonwealth Drive
Menlo Park, CA 94025

telephone 650-326-9400
facsimile 650-326-8072
www.exponent.com

March 25, 2016

Mr. Matthew Zito
Chief Facilities Officer
480 James Avenue
Redwood City, CA 94062

Subject: Menlo Park Small High School Notice of Preparation

Dear Mr. Zito:

Per the request in your Notice of Preparation for the Menlo Park Small High School Project Environmental Impact Report, Exponent respectfully submits the following comments for consideration by the Sequoia Union High School District.

On behalf of Exponent, Green Environment, Inc. (GEI) recently completed environmental due diligence work at 160 Jefferson Drive in Menlo Park. GEI concluded that under current commercial/industrial land use, there does not appear to be a concerning risk of vapor intrusion into the *subject property* building from VOCs present in groundwater and soil vapor on the *subject property*. However, it should be noted that if those VOC data are compared to residential screening levels, some contamination data are above residential levels. These findings are consistent with the regional contamination issue that has been well documented over many years, including by the Cornerstone Earth Group for the site at 150 Jefferson Drive in Menlo Park.

Exponent has provided Mr. Charles Ice at San Mateo County Environmental Health Department with the environmental due diligence report issued by GEI along with 25 other related reports Exponent provided to GEI to conduct their work. If you are interested in any of those reports, please contact Mr. Charles Ice at San Mateo County.

The use of this site as a high school and community college will create serious traffic and parking issues in and around Bohannon Business Park, detrimentally impacting neighboring businesses. Especially considering that there is no public transit supporting the area; the site plans do not accommodate student parking; and the traffic systems are not designed to accommodate the surges in traffic that will result from the school's schedule and volume.

The traffic impact analysis should also consider the future traffic from the completion of all phases of the voter approved Menlo Park Gateway project; reoccupying of 180 Jefferson Drive (former Intuit campus); and occupying of the recently constructed buildings at 164 Jefferson Drive.

If you have any questions, feel free to contact me via telephone at (650) 688-7154 or via email at schlenker@exponent.com.

Regards,

Richard Schlenker

Richard Schlenker
Executive Vice President and Chief Financial Officer

Ex™

APPENDIX B:

GEOLOGIC AND GEOTECHNICAL SITE EVALUATIONS

- March 23, 2016 Geotechnical Investigation and Geologic Hazards Evaluation

CORNERSTONE EARTH GROUP

TYPE OF SERVICES	Geotechnical Investigation and Geologic Hazards Evaluation
PROJECT NAME	150 Jefferson New High School Campus
LOCATION	150 Jefferson Drive Menlo Park, California
CLIENT	Sequoia Union High School District
PROJECT NUMBER	166-14-9
DATE	March 23, 2016

CORNERSTONE
EARTH GROUP

Type of Services	**Geotechnical Investigation and Geologic Hazards Evaluation**
Project Name	**150 Jefferson New High School Campus**
Location	**150 Jefferson Drive** **Menlo Park, California**
Client	**Sequoia Union High School District**
Client Address	**480 James Avenue** **Redwood City, CA**
Project Number	**166-14-9**
Date	**March 23, 2016**

Prepared by

Matthew A. Anderson, P.E.,
Project Engineer
Geotechnical Project Manager

PROFESSIONAL ENGINEER
MATTHEW ANDERSON
C 81994
Exp. 3-31-16
CIVIL
STATE OF CALIFORNIA

Craig S. Harwood, P.G., C.E.G.
Senior Engineering Geologist

REGISTERED GEOLOGIST
CRAIG S. HARWOOD
Exp. 03-31-16
C.E.G. No. 2275
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Scott E. Fitinghoff, P.E., G.E.
Senior Principal Engineer
Geotechnical Engineer of Record
Quality Assurance Reviewer

REGISTERED PROFESSIONAL ENGINEER
SCOTT E. FITINGHOFF
NO. 2379
Exp. 06/30/16
GEOTECHNICAL
STATE OF CALIFORNIA

CORNERSTONE EARTH GROUP

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Type of Services	**Geotechnical Investigation and Geologic Hazards Evaluation**
Project Name	**150 Jefferson New High School Campus**
Location	**150 Jefferson Drive Menlo Park, California**

SECTION 1: INTRODUCTION

This geotechnical investigation and geologic hazards evaluation report was prepared for the sole use of Sequoia Union High School District (SUHSD) and their design consultants for the new small high school campus project located at 150 Jefferson Drive in Menlo Park, California. The location of the site is shown on the Vicinity Map, Figure 1. The site is located at Latitude 37.482152°, Longitude -122.173860°. For our use, we were provided an undated conceptual site plan titled "Menlo Park Small High School – Conceptual Site Plan," prepared by LPA, Inc.

1.1 PROJECT DESCRIPTION

The site is currently occupied by a large single story commercial warehouse building surrounded by at-grade pavements. The rear of the building is raised approximately 5 feet to accommodate the at-grade truck docks located on the back side of the building. We understand that a small high school campus is currently planned for the site.

The planned development will include a three-story, at-grade building, likely of steel-frame construction. The planned development will have a footprint of approximate 21,000 square feet. An outdoor amphitheater, appurtenant parking, utilities, landscaping and other improvements necessary for site development are also planned.

Structural loads are anticipated to range from 300 to 400 kips for interior columns and 4 to 6 kips per lineal foot for exterior walls. Grading is anticipated to include minor cuts and fills on the order of 1 to 3 feet, as well as backfill of any excavations created during site demolition

1.2 SCOPE OF SERVICES

Our scope of services was presented in our proposal dated February 13, 2016 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, retaining walls, 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 two borings drilled on February 29 and March 1, 2016 with truck-mounted hollow-stem auger drilling equipment. The borings performed for the design-level investigation were drilled to depths of 90 to 100 feet.

We also utilized previous explorations from our preliminary geotechnical investigation, which consisted of two borings drilled on November 22, 2014 with truck-mounted, hollow-stem auger drilling equipment and three Cone Penetration Tests (CPTs) advanced on November 22, 2014. The borings were drilled to depths of 50 feet; the CPTs were advanced to depths of 70 feet.

The borings and CPTs 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, grain size analyses, washed sieve analyses, Plasticity Index tests, a one-dimensional consolidation test, and triaxial compression tests. Details regarding our laboratory program are included in Appendix B.

1.5 ENVIRONMENTAL SERVICES

Cornerstone Earth Group also provided environmental services for this project. Environmental findings and conclusions are provided under separate covers.

SECTION 2: REGIONAL SETTING

2.1 GEOLOGIC SETTING

The San Francisco peninsula is a relatively narrow band of rock at the north end of the Santa Cruz Mountains separating the Pacific Ocean from San Francisco Bay. This represents one mountain range in a series of northwesterly-aligned mountains forming the Coast Ranges geomorphic province of California that stretches from the Oregon border nearly to Point Conception. In the San Francisco Bay area, most of the Coast Ranges have developed on a basement of tectonically mixed Cretaceous- and Jurassic age (70- to 200-million years old) rocks of the Franciscan Complex. Locally these basement rocks are capped by younger sedimentary and volcanic rocks. Most of the Coast Ranges are covered by still younger surficial deposits that reflect geologic conditions of the last million years or so.

Movement on the many splays of the San Andreas fault system has produced the dominant northwest-oriented structural and topographic trend seen throughout the Coast Ranges today. This trend reflects the boundary between two of the Earth's major tectonic plates: the North American plate to the east and the Pacific plate to the west. The San Andreas fault system (including its major branches) is about 40 miles wide in the Bay area and extends from the San Gregorio fault near the coastline to the Coast Ranges-Central Valley blind thrust at the western edge of the Great Central Valley as shown on the Regional Fault Map, Figure 3. The San Andreas fault is the dominant structure in this system, nearly spanning the length of California, and capable of producing the highest magnitude earthquakes. Many other subparallel or branch faults within the San Andreas system are equally active and nearly as capable of generating large earthquakes. Right-lateral movement dominates on these faults but an increasingly large amount of thrust faulting resulting from compression across the system is now being identified also.

The subject school site is located on the flatlands adjacent to the San Francisco Bay about one mile south of the present tidal flats. Several types of alluvium blanket this land between the Bay and the foothills. These regional geologic units are shown on the Vicinity Geologic Map, Figure 4.

2.2 REGIONAL SEISMICITY

The significant earthquakes that occur in the Bay Area are generally associated with crustal movement along well-defined, active fault zones of the San Andreas Fault system, which regionally trend in a northwesterly direction. The Monte Vista-Shannon fault passes 4 miles southwest of the school campus. The San Andreas Fault generated the great San Francisco earthquake of 1906 and the Loma Prieta earthquake of 1989, and passes approximately 6½ miles southwest of the school campus. Two other major active faults in the Bay area are Hayward and Calaveras Faults, located about 12½ and 18 miles northeast of the site, respectively. In addition, the San Gregorio fault passes about 16 miles to the southwest of the school campus. Table 1 lists all known active faults in order of increasing distance within 100 kilometers (62 miles) of the site. A computer program called EZ Frisk was used to generate the fault distances. The seismic characteristics of some faults vary along its length so different segments of the same fault could be listed separately in the table. The seismic characteristics of some faults vary along its length so different segments of the same fault could be listed separately in the table. Also, the distances generated by EZ Frisk may be different than shown on other published geologic maps and databases.

Table 1: Known Active Faults Within 100-km Radius of Site

Abbreviated Fault Name	Approximate (mi)	Distance (km)
Monte Vista – Shannon	5.1	8.2
Northern San Andreas	6.6	10.6
Hayward-Rodgers Creek	12.4	20.0
San Gregorio	15.9	25.6
Calaveras	18.0	29.0
Mount Diablo Thrust	26.0	41.8
Zayante – Vergeles	29.3	47.2
Green Valley	30.6	49.3
Greenville	30.7	49.4
Great Valley 7	34.5	55.5
Monterey Bay – Tularcitos	38.8	62.5
Great Valley 5, Pittsburg Kirby Hills	41.4	66.7
West Napa	47.2	76.0
Point Reyes	48.1	77.4
Great Valley 8	50.7	81.7
Ortigalita	51.1	82.3
Great Valley 4b, Gordon Valley	53.0	85.3
Quien Sabe	58.8	94.7
Rinconada	60.2	97.0

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% for UCERF2 to about 7.0% 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.

2.3 HISTORICAL EARTHQUAKES

We reviewed and performed a data search of known historical earthquakes of magnitude 5 or greater within a 100-kilometer radius of the site using available published data from the CDMG computerized earthquake catalog of events through December 1999. Figure 5 shows the epicenters of these magnitude 5 or greater events. We also included data from Townley and Allen (1939) and the U.S. Geological Survey Earthquake Data Base System, giving 200 years of data in the search area. The results of our computer search indicated that about 79 known earthquakes of Richter Magnitude 5 or greater have occurred within 100 kilometers of the site between 1800 and December 1999.

SECTION 3: SITE CONDITIONS

3.1 GEOMORPHOLOGY AND RECENT HISTORY

The subject school property is located on essentially topographically flat land and there are no moderate to steep slopes located anywhere near the site.

The site is located in an area that is essentially flat lying and accordingly has not received substantial modifications due to human activities. Aerial photographs listed in the References show the site vicinity at different times spanning the period from 1948 to 2012. Historic topographic maps of the Palo Alto 7.5 min Quadrangle were also reviewed that include the years of 1899, 1953, 1961 and 1968. The 1899 map shows the site and surrounding area as undeveloped in an area characterized as an extensive marshland that borders the southwest edge of the Bay. The photos of 1948 show the site in an area dominated by open fields with sparse dirt roads. This condition continues through at least 1960. The photos of 1968 show the light industrial park is already developed and the subject site contains a large warehouse which dominates the property as it does today. The subsequent photos show the industrial park and adjacent areas filling becoming progressively more and more developed.

3.2 SITE RECONNAISSANCE AND SURFACE DESCRIPTION

At the time of the reconnaissance, the immediate area in the vicinity of the site is heavily developed for commercial and light industrial purposes. An existing, single story commercial building dominates the majority of the site. Surrounding the building are paved access drives and a parking lot on the eastern side of the building. The property is bordered by landscaped vegetation (trees and shrubs). The actual building envelope area is essentially flat and the paved areas have been graded to direct runoff to catch basins. We observed no evidence of ground cracking of areas of subgrade distress at the ground surface.

3.3 SITE GEOLOGY AND SUBSURFACE CONDITIONS

Roughly half the Palo Alto Quadrangle is covered by Quaternary alluvial sediment shed from the northwest-trending Santa Cruz Mountains that occupy the south and southwest portion of the Palo Alto quadrangle (Pampeyan, 1993). The site is in an area adjacent to the San Francisco Bay where Holocene age (11,000 years or less before present) alluvial fan deposits account for the majority of Quaternary sediment deposited in the northeastern portion of the Palo Alto Quadrangle. Pampeyan's map of 1993 indicates the site is in an area which is underlain by fine-grained alluvium (Qaf) on the south. Overlying these units is widespread artificial fill (Qf) that resulted from the previous infilling of an extensive tidal marsh. The mapping by Pampeyan suggests the site may be underlain primarily by the "Qaf" unit. The Qaf unit is described as "unconsolidated, poorly sorted, plastic, organic clay, and silty clay, which contains thin well sorted interbeds of sand and fine gravel." This unit is generally less than 15 feet thick and forms in poorly drained interfluvial basins, usually at margins of tidal marshlands and the unit interfingers with bay mud ("Qm"). The CGS designates this mapping unit as Qhff or "alluvial fan fine facies". The CGS published a compilation of geotechnical testing of this unit which consisted of: 76 % clay, 8% silty sand, 5% lean clayey sand, 5% silts, and 6% other soil constituents (CGS, 2006). The above-mentioned published map of Pampeyan was used as the base for our Vicinity Geologic Map, Figure 4.

Below the surface pavements, our explorations generally encountered several feet of very stiff to hard fat clay underlain by medium stiff to hard lean clay with variable amounts of sand through the majority of the depth explored, 50 feet. Based on our explorations, the soils between about 5 to 10 feet have moderate shear strengths and are moderately compressible depending on the foundation loads. We encountered several medium dense sand layers ranging from about 2 to 7 feet thick between depths of 10 to 50 feet below grade. Uncorrected field blow counts obtained during the field sampling procedure indicate the clays and silts were found to be in a stiff to locally very stiff condition whereas the sands were of a medium dense to (locally) very dense condition. Overall, the subsurface soils are generally consistent with the published test results of the Qhff unit as presented in the California Geological Survey (2006).

Our Geologic Cross Sections A-A' and B-B' present our interpretation of the subsurface profile and were generated from the site geologic map as well as the exploratory boring data (Figures 6 and 7).

3.3.1 Plasticity/Expansion Potential

We performed one 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 PI's of 39, indicating 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 10 feet range from about 1 to 15 percent over the estimated laboratory optimum moisture.

3.4 GROUND WATER

Ground water was encountered in some of our explorations including Borings EB-1, and EB-2 and inferred from pore pressure dissipation test from CPT-1 and CPT-2 at depths ranging from 6 to 8½ feet below current grades. CGS (2006) indicates that the depth to historic high ground water is on the order of 5 feet in the site area. All measurements were taken at the time of drilling and may not represent the stabilized levels that can be higher than the initial levels encountered.

Fluctuations in ground water levels occur due to many factors including seasonal fluctuation, underground drainage patterns, regional fluctuations, and other factors.

Table 2: Depth to Ground Water

Boring Number	Date Drilled	Approximate Depth to Ground Water* (feet)	Depth of Boring
EB-1	Nov. 22, 2014	6	50
EB-2	Nov. 22, 2014	6	50
EB-3	Feb. 29, 2016	6¼	100
EB-4	Mar. 1, 2016	6	90

*Measured from existing ground surface.

3.5 CORROSION SCREENING

We tested four samples collected from Borings EB-1 and EB-2 at depths ranging from 3½ to 9 feet for resistivity, pH, soluble sulfates, and chlorides. The laboratory test results are summarized in Table 2.

Table 3: Summary of Corrosion Test Results

Boring	Depth (feet)	Soil pH[1]	Resistivity[2] (ohm-cm)	Chloride[3] (mg/kg)	Sulfate[4,5] (mg/kg)
EB-3	2	7.7	892	100	67
EB-4	5½	8.0	936	17	85

Notes: [1]ASTM G51
[2]ASTM G57 - 100% saturation
[3]ASTM D3427/Cal 422 Modified
[4]ASTM D3427/Cal 417 Modified
[5]1 mg/kg = 0.0001 % by dry weight

Many factors can affect the corrosion potential of soil including moisture content, resistivity, permeability, and pH, as well as chloride and sulfate concentration. Typically, soil resistivity, which is a measurement of how easily electrical current flows through a medium (soil and/or water), is the most influential factor. In addition to soil resistivity, chloride and sulfate ion concentrations, and pH also contribute in affecting corrosion potential.

Based on the laboratory test results summarized in Table 2, the soils are considered very severely corrosive to buried metallic improvements (Palmer, 1989). Other corrosion parameters (pH and chloride content) do not indicate a significant contribution to corrosion potential to buried metallic structures. In accordance with the 2013 CBC, Chapter 19, Section 1904A.2:

Concrete mixtures shall conform to the most restrictive maximum water-cementitious materials ratios, maximum cementitious admixtures, minimum air-entrained and minimum specified concrete compressive strength requirements of ACI 318 based on the exposure classes assigned in Section 1904A.1.

We recommend the structural engineer and a corrosion engineer be retained to confirm the information provided and for additional recommendations, as required.

SECTION 4: GEOLOGIC HAZARDS

This section presents our Geologic Hazards review, following the requirements of the Division of State Architects (DSA), the Office of Regulatory Services (ORS), and the California Geological Survey (CGS), formerly the California Division of Mines and Geology (CDMG), for the new small high school campus site located at 150 Jefferson Drive in Menlo Park, California. Our Certified Engineering Geologist performed a reconnaissance of the site on March 15, 2016.

4.1 FAULT RUPTURE

A map showing known faults in the region surrounding Menlo Park Small High School is presented on Figure 3. The site is not located within a currently designated Alquist-Priolo Earthquake Fault Zone, known formerly as a Special Studies Zone, and no surface expression of active faulting was identified on aerial photographs of the site or during the field reconnaissance (CGS, 2006). The Monte Vista – Shannon Fault zone is the closest active fault and it is located approximately 5 miles to the southwest. In our judgment, primary fault rupture is not anticipated at the site.

4.2 HISTORICAL GROUND FAILURES

Many historical earthquakes have occurred on active faults and fault branches throughout coastal California, but the San Andreas Fault is considered one of the major active faults of the region. It generated significant, damaging earthquakes in 1836 and 1868, as well as the great San Francisco Earthquake of 1906, which had an approximate Richter Magnitude of 8.3, and the Loma Prieta Earthquake of 1989. Very few observations of the 1868 Hayward earthquake record specific evidence for liquefaction in the region. However, Lawson (1908) reports a story from a survivor of the 1868 earthquake, Mrs. N. Ainsworth, in which she states by second hand information that "water spurted up in the streets of San Jose, and out in the road between Milpitas and San Jose, to the height of several feet." The 1906 earthquake on the San Andreas Fault was the highest magnitude earthquake recorded in California. The area of the site was sparsely populated however and therefore the main sources of information come from residents of areas of the concentrated population such as downtown San Jose, Los Gatos and Palo Alto as examples. Considerable damage from the 1906 earthquake in the Redwood City area was reported by Lawson (1908, p. 259). "The intensity of the earthquake in Redwood City was about IX (Rossi-Forel Intensity). Many buildings were partially wrecked and the new court-house was completely ruined. Over 40 houses in the town were moved upon their foundations, and a majority of the houses had the plaster badly cracked. Ninety-four percent of the chimneys fell, and dishes and similar objects were universally thrown down. Along the two roads leading from Redwood to Portola, out of 23 public water-tanks 20 were thrown down."

Ground failure occurred during the 1906 earthquake. In the general area (alluvial plain that lies adjacent to the south bay region) Youd and Hoose (1978) compiled four instances of ground failure. Three of the incidents occurred in Holocene alluvial fan deposits, fine facies (Qhff), and a forth incident occurred in San Francisco Bay Mud deposits (Qhbm, afbm). The nearest of these ground failure occurrences is located about 5 miles south-southeast of the subject site. Witter et, al., (2006) indicate four historical occurrences of ground deformation (ground cracks and a lateral spread) along San Francisquito Creek about 2 miles southwest of the site. No observations of coseismic ground rupture (compressional deformation) was known to occur in the immediate area as a result of the Loma Prieta Earthquake (Schmidt, et al.1995).

4.3 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 $PGA_M = F_{PGA} \times PGA_G$ (Equation 11.8-1) as allowed in the 2013 California Building Code. For our analysis we used a PGA of 0.57g.

4.4 LIQUEFACTION POTENTIAL

The site is within a State-designated Liquefaction Hazard Zone (CGS, Palo Alto Quadrangle, 2006) as shown in Figure 8, Seismic Hazard Map. Our field and laboratory programs addressed this issue by sampling potentially liquefiable layers to depths of at least 50 feet, performing visual classification on sampled materials, evaluating CPT correlations, and performing various tests to further classify the soil properties.

4.4.1 Background

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.

4.4.2 Analysis

As discussed in the "Subsurface" section above, several sand layers were encountered below the design ground water depth of 5 feet. Following the procedures in the 2008 monograph, *Soil Liquefaction During Earthquakes* (Idriss and Boulanger, 2008) and in accordance with CDMG Special Publication 117A guidelines (CDMG, 2008) for quantitative analysis, these layers were analyzed for liquefaction triggering and potential post-liquefaction settlement. These methods compare the ratio of the estimated cyclic shaking (Cyclic Stress Ratio - CSR) to the soil's estimated resistance to cyclic shaking (Cyclic Resistance Ratio - CRR), providing a factor of safety against liquefaction triggering. Factors of safety less than or equal to 1.3 are considered to be potentially liquefiable and capable of post-liquefaction re-consolidation.

The CSR for each layer quantifies the stresses anticipated to be generated due to a design-level seismic event, is based on the peak horizontal acceleration generated at the ground surface discussed in the "Estimated Ground Shaking" section above, and is corrected for overburden and stress reduction factors as discussed in the procedure developed by Seed and Idriss (1971) and updated in the 2008 Idriss and Boulanger monograph.

The soil's CRR is estimated from the in-situ measurements from CPTs and laboratory testing on samples retrieved from our borings. SPT "N" values obtained from hollow-stem auger borings were not used in our analyses, as the "N" values obtained are unreliable in sands below ground water. The tip pressures are corrected for effective overburden stresses, taking into consideration both the ground water level at the time of exploration and the design ground water level, and stress reduction versus depth factors. The CPT method utilizes the soil behavior type index (I_C) to estimate the plasticity of the layers.

It is noted that a layer of well graded sand with silt and gravel, estimated to be approximately 6 to 7 feet in thickness, was encountered in our borings at a depths beginning at about 17 to 37 feet below site grades. The work of Professor DeJong of the University of California Davis suggests that soils containing a gravel content greater than about 15 to 20 percent, with maximum gravel size of ¼-inch or more, should be considered for corrections.

Considering that the potentially liquefiable layers have a fines content ranging from about 10 to 15 percent, blow counts ranging from 30 to 100 blows per foot, and a gravel content ranging from about 20 to 30 percent, in our opinion, the percentage of the coarser components should not have a noticeable effect on the CPT output or the liquefaction analysis. In addition, to account for possible corrections due to the gravel content in this isolated sandy layer, we did not implement a depth weighting factor, such as the factor proposed by Cetin (2009).

The results of our CPT analyses (CPT-1, CPT-2, and CPT-3) are presented on Figures 4A and 4C of this report. Calculations for these CPTs are attached as Appendix C.

4.4.3 Summary

Our preliminary analyses indicate that several layers could potentially experience liquefaction triggering that could result in soil softening and post-liquefaction total settlement ranging from ¼- to 1-inch based on the Yoshimine (2006) method. As discussed in SP 117A, differential movement for level ground sites over deep soil sites will be up to about two-thirds of the total settlement. In our opinion, differential settlements are anticipated to be on the order of $^2/_3$-inch between independent foundation elements, assumed over a horizontal distance of approximately 30 feet.

4.4.4 Ground Rupture Potential

The methods used to estimate liquefaction settlements assume that there is a sufficient cap of non-liquefiable material to prevent ground rupture or sand boils. For ground rupture to occur, the pore water pressure within the liquefiable soil layer will need to be great enough to break through the overlying non-liquefiable layer, which could cause significant ground deformation and settlement. The work of Youd and Garris (1995) indicates that the non-liquefiable cap is sufficient to prevent ground rupture; therefore, ground rupture is not expected and the above total settlement estimates are reasonable.

4.5 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.

There are no open faces within a significant distance of the site where lateral spreading could occur; therefore, in our opinion, the potential for lateral spreading to affect the site is low.

4.6 SEISMIC SETTLEMENT/UNSATURATED SAND SHAKING

Loose unsaturated sandy soils can settle during strong seismic shaking. As the unsaturated soils encountered at the site above the ground water table were predominantly stiff to very stiff clays, in our opinion, the potential for significant differential seismic settlement affecting the proposed improvements is low.

4.7 LANDSLIDING

The site is essentially flat lying and there are no slopes located anywhere near it that could potentially impact it. Therefore, landsliding is judged not to be a hazard at the site.

4.8 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. More recently the Santa Cruz harbor was damaged by the Tsunami that followed the 8.9 magnitude Japanese earthquake of March 11, 2011. 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 3 miles of the shoreline. The site is approximately 1.2 mile inland from the San Francisco Bay shoreline. Therefore, the potential for inundation due to tsunami or seiche is considered to be low.

4.9 FLOODING

Based on our internet search of the Federal Emergency Management Agency (FEMA) flood map public database, the site is located within Zone X, an area determined to be outside the 0.2% annual chance floodplain. We recommend the project civil engineer be retained to confirm this information and verify the base flood elevation, if appropriate.

4.10 VOLCANIC ERUPTION

The site is located over 200 miles hundred miles from the nearest potentially or historically active volcano (at Mt. Lassen Park). We believe the volcanic eruption hazard for the school site is very low.

4.11 NATURALLY OCCURING ASBESTOS

Greenstone can contain ultra-mafic rocks such as serpentine that contain Naturally Occurring Asbestos (NOA). Serpentine or greenstone bedrock or other ultra-mafic rocks were not observed at the site during our site reconnaissance. The nearest outcrop of any rock type generally associated with NOA is serpentinite which outcrops on a north facing hillside located about 4½ miles southwest of the site. However, it is unlikely that asbestos bearing detritus would have traveled such a distance over variable terrain. Therefore, NOA is not anticipated to be present at the site based on the site geology.

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.

- Potential for static and seismic (liquefaction) induced settlements
- Presence of highly expansive soils
- Presence of shallow ground water

5.1.1 Potential for Static and Seismic (Liquefaction) Induced Settlements

Our explorations encountered a medium stiff clay layer encountered between the depth of 5 to 10 feet that could be moderately to highly compressible depending on the magnitude of the building loads and loads from any raising of site grades, if any. Our settlement analysis indicates that a three-story building supported on shallow foundations, consisting of conventional spread footings could settle between 2 to 3 inches, which we expect will not be tolerable.

It appears that a mat foundation may be feasible for the proposed three-story classroom building provided the structure is designed to withstand the total and differential settlements. Total static settlements of the mat foundation based on an average areal contact pressure of 375 psf at a depth of about 2 feet below existing grades are estimated to range from about $^{2}/_{3}$-inch at the center of the mat. Adding in the seismic differential settlements, we anticipate total differential settlement will be on the order of 1-inch from the middle of the mat across the short edge, estimated over a horizontal distance of about 50 feet. If the mat foundation is desired, we should work with the structural engineer to confirm contact pressures and settlement estimates prior to final design.

Alternatively, the proposed classroom building may be supported on deep foundations if the estimated mat foundation settlements are not tolerable. Further recommendations for the foundations are presented in the "Foundations" section of this report.

5.1.2 Presence of Highly Expansive Soils

Highly expansive surficial soils generally blanket 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. Foundation recommendations for the proposed structure are presented in the "Foundations" section.

5.1.3 Shallow Ground Water

Shallow ground water was measured at depths ranging from approximately 6 to 8 feet below the existing ground surface. CGS has mapped the depth to historic ground water on the order of 5 feet at the project site but higher perched ground water may exist due to the proximity of the San Francisco Bay. Our experience with similar sites in the vicinity indicates that shallow ground water could significantly impact grading and underground construction. These impacts typically consist of potentially wet and unstable pavement subgrade, difficulty achieving compaction, and difficult underground utility installation. Dewatering and shoring of utility trenches may be required in some isolated areas of the site if these trenches are excavated deeper than about 5 feet.

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, CLEARING AND PREPARATION

6.1.1 Site Stripping

The site should be stripped of all surface vegetation, and surface and subsurface improvements within the proposed development area. Demolition of existing improvements is discussed in detail below. A detailed discussion of removal of existing fills is provided later in this report. Surface vegetation and topsoil should be stripped to a sufficient depth to remove all material greater than 3 percent organic content by weight. We estimate stripping depths will be on the order of 4 to 6 inches in landscape areas.

6.1.2 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.

6.1.3 Demolition of Existing Slabs, Foundations and Pavements

All slabs, foundations, and pavements should be completely removed from within planned building areas. 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 provide subsurface drainage. A discussion of recycling existing improvements is provided later in this report.

6.1.4 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 risks 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. In general, the risk is relatively low for single utility lines less than 4 inches in diameter, and increases with increasing pipe diameter.

6.2 REMOVAL OF EXISTING FILLS

While fills were not encountered in our borings, we anticipate the presence of fill from the existing development will be present, especially where site grades were raised to accommodate the at-grade truck docks, and any fills encountered during site grading should be completely removed from within building areas and 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 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.

Fills extending into planned pavement and flatwork areas may be left in place provided they are determined to be a low risk for future differential settlement and that the upper 12 to 18 inches of fill below pavement subgrade is re-worked and compacted as discussed in the “Compaction” section below. In our opinion, the fills encountered at this site should be further evaluated during the time of construction.

6.3 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 10 feet at the site may be classified as OSHA Soil Type 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 3:1 (horizontal:vertical) within the upper 5 feet below building subgrade, unless approved by our representative in the field.

6.4 CONSTRUCTION DEWATERING

Ground water levels are expected to be near, or slightly below, the anticipated excavation bottom for the elevator pit and utility excavations; therefore, temporary dewatering could be necessary during construction. If required, the design, selection of the equipment and dewatering method, and construction of temporary dewatering should be the responsibility of the contractor. Modifications to the dewatering system are often required in layered alluvial soils and should be anticipated by the contractor. The dewatering plan, including planned dewatering well filter pack materials, should be forwarded to our office for review prior to implementation.

The dewatering design should maintain ground water at least 2 feet below localized excavations such as deepened footings, elevator shafts, and utilities. If the dewatering system was to shut down for an extended period of time, destabilization and/or heave of the excavation bottom requiring over-excavation and stabilization, flooding and softening, and/or shoring failures could occur; therefore, we recommend that a backup power source be considered.

Depending on the ground water quality and previous environmental impacts to the site and surrounding area, settlement and storage tanks, particulate filtration, and environmental testing may be required prior to discharge, either into storm or sanitary, or trucked to an off-site facility.

6.5 SUBGRADE PREPARATION

After site clearing and demolition is complete, and prior to backfilling any excavations resulting from fill removal 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 6 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.

As discussed in the “Subsurface” section in this report, the in-situ moisture contents are about 1 to 15 percent over the estimated laboratory optimum in the upper 10 feet of the soil profile. The contractor should anticipate drying the soils prior to reusing them as fill. In addition, repetitive rubber-tire loading will likely de-stabilize the soils.

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 8 to 10 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.

6.6.4 Below-Grade Excavation Stabilization

If the planned elevator pit and/or utility trench excavations extend near/below the current ground water level, we recommend that the contractor plan to excavate an additional 12 to 18 inches below subgrade, place a layer of stabilization fabric (Mirafi 500X, or equivalent) at the bottom, and backfill with clean, crushed rock. The crushed rock should be consolidated in place with light vibratory equipment. Rubber-tire equipment should not be allowed to operate on the exposed subgrade; the crushed rock should be stockpiled and pushed out over the stabilization fabric.

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 asphalt concrete (AC) grindings and aggregate base (AB) and Portland Cement Concrete (PCC) 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, including within below-grade parking garage slab-on-grade areas (provided crushed rock is not required due to the proximity to ground water). AC/AB grindings may not be reused within the building footprint 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 habitable building areas, excluding the capillary break layer; as typically pulverized PCC comes close to or meets Class 2 AB specifications, the recycled PCC may 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 and non-expansive material should be inorganic with a Plasticity Index (PI) of 15 or less, and not contain recycled asphalt concrete where it will be used within the building footprint 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 for high PI clayey soil materials 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 4: 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
General Fill (below a depth of 5 feet)	On-Site Expansive Soils	93	>3
	Low Expansion Soils	95	>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

Ponding or discharge should not be allowed adjacent to foundations or slabs-on-grade. Hardscape surfaces should slope at least 2 percent towards suitable discharge facilities; landscape areas should slope at least 3 percent. Roof runoff should be directed away from foundation areas.

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 clayey, and categorized as Hydrologic Soil Group D, and is 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 not mapped in the area, but was encountered as high as 5 feet below grade in our borings, and therefore is expected to be within 10 feet below the base of the infiltration measure.
- In our opinion, infiltration locations within 10 feet of the buildings would create a geotechnical hazard.

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 moderately to highly 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, and

- 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 three-story building may be supported on a mat foundation, provided the structure is designed to withstand the estimated total and differential settlements and that the recommendations in the “Earthwork” section and the sections below are followed. Alternatively, in our opinion, the building may be supported on deep foundations, consisting of displacement, or partial-displacement, augercast pressure grouted (APGD) piles.

7.2 SEISMIC DESIGN CRITERIA

We understand that the project structural design will be based on the 2013 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 deep alluvial soils with typical SPT “N” values between 15 and 50 blows per foot. Therefore, we have classified the site as Soil Classification D. The mapped spectral acceleration parameters S_S and S_1 were calculated using the USGS computer program *Earthquake Ground Motion Parameters*, Version 5.1.0, revision date February 10, 2011, 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 5: CBC Site Categorization and Site Coefficients

Classification/Coefficient	Design Value
Site Class	D
Site Latitude	37.48215°
Site Longitude	-122.17386°
0.2-second Period Mapped Spectral Acceleration[1], S_S	1.500g
1-second Period Mapped Spectral Acceleration[1], S_1	0.642g
Short-Period Site Coefficient – Fa	1.0
Long-Period Site Coefficient – Fv	1.5
0.2-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects - S_{MS}	1.500g
1-second Period, Maximum Considered Earthquake Spectral Response Acceleration Adjusted for Site Effects – S_{M1}	0.962g
0.2-second Period, Design Earthquake Spectral Response Acceleration – S_{DS}	1.000g
1-second Period, Design Earthquake Spectral Response Acceleration – S_{D1}	0.642g

[1]For Site Class B, 5 percent damped.

7.3 SHALLOW FOUNDATIONS FOR THREE-STORY BUILDING

7.3.1 Reinforced Concrete Mat Foundation

It appears that the new three-story classroom building may be supported on a reinforced concrete mat foundation provided the structure is designed to withstand the estimated total and differential settlements and that the recommendations in the “Earthwork” section and the sections below are followed. The mat foundation for the new building should be designed for a maximum average areal pressure of 375 psf for dead plus live loads; at column or wall loading, the maximum localized bearing pressures should be limited to 1,000 psf. When evaluating wind and seismic conditions, allowable bearing pressures may be increased by one-third. These pressures are net values; the weight of the mat may be neglected for the portion of the mat extending below grade. Top and bottom mats of reinforcing steel should be included as required to help span irregularities and differential settlement. These recommendations may be revised depending on the particular design method selected by the structural engineer.

7.3.2 Mat Foundation Settlement

Structural loads are not available at this time; therefore, we estimated that the average areal pressure exerted on the subgrade soils by the three-story classroom building will be approximately 375 psf for dead plus live loading. As final loading is not known at this time, we be retained to update our settlement analyses if average areal pressures are higher than assumed.

Total static settlements of the mat foundation based on an average areal contact pressure of up to 375 psf at a depth of about 2 feet below existing grades are estimated to range from about $^2/_3$-inch at the center of the mat. Adding in the seismic differential settlements, we anticipate total differential settlement will be approximately 1-inch from the middle of the mat across to the short edge, estimated over a horizontal distance of about 50 feet.

If the above preliminary settlement estimates are not tolerable, or if the mat contact pressures will be significantly higher, resulting in additional static settlement, ground improvement to depths of at least 30 feet below existing grade (or deeper if needed for additional static settlement reduction) such as Impact Piers (open graded gravel displacement columns) or Drilled Displacement Columns (augered displacement columns filled with sand-cement slurry) may be considered to reduce the static and seismic settlements to tolerable levels.

Alternatively, the structure may be supported on deep foundations, such as displacement or partial-displacement augercast piles, which have similar capacities as driven piles but are constructed with low noise and vibrations.

7.3.3 Mat Modulus of Soil Subgrade Reaction

We recommend using a variable modulus of subgrade reaction to provide a more accurate soil response and prediction of shears and moments in the mat foundation. A preliminary modulus of soil subgrade reaction for static loading of 5 pounds per cubic inch (pci) is recommended for the initial mat analysis. Once a SAFE-type analysis is performed and more detailed contact pressures are developed, if desired, we should be retained to provide supplemental consultation with the structural engineer to prepare a plan of contours of equal modulus of subgrade reaction values for a subsequent mat analysis. Please forward your initial analysis when it is available for our use.

7.3.4 Lateral Loading

Lateral loads may be resisted by friction between the bottom of mat foundation and the supporting subgrade, and also by passive pressures generated against the mat edges. An ultimate frictional resistance of 0.40 applied to the mat 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. The upper 12 inches of soil should be neglected when determining passive pressure capacity.

7.3.5 Mat Foundation Construction Considerations

The soils near and below the current water table will be at near saturated conditions. Subgrade stabilization may be required as discussed in the “Earthwork” section above to construct the thicker sections of mat foundations and isolated depressions.

7.4 DEEP FOUNDATIONS

7.4.1 Augercast Piles

As an alternative to a mat foundation, augercast piles may be used to support the proposed classroom building. It appears that drilled, cast-in-place displacement augercast piles are feasible throughout most of the site; however, as previously discussed, we encountered medium dense to dense layer of sand ranging from about 4 to 7 feet in thickness; therefore, some areas of the site could require partial-displacement and/or conventional augercast piles.

Displacement augercast piles have been successfully used for projects in downtown San Jose, Menlo Park, East Palo Alto, and Milpitas in similar soil conditions. Augercast piles are concrete piles that are cast in place using a hollow-stem auger that drills to the design depth and then the sand-cement grout (4,000 to 6,000 psi grout) is pumped through the hollow-stem as the drill stem is extracted. Two types of augercast piles are available: APG piles, which like piers, remove the soil column and replace it with grout; and APGD piles, which displace the soil column as the drill stem is advanced, similar to driven piles, prior to pumping the grout. We anticipate that displacement augercast piles are feasible for this site. Although APGD piles displace the soil column during advancement, some spoils will be generated; therefore, disposal and/or removal of drill spoils from the site should be expected and planned for. Augercast piles are a low noise and vibration installation compared to driven piles. Various types of steel reinforcing, including rebar cages or H-piles may be installed into the still-wet grout after drilling to satisfy bending moment requirements.

7.4.2 Vertical Capacity

The proposed structural loads may be supported on piles. Adjacent pile centers should be spaced at least three diameters apart; otherwise, a reduction for vertical group effects may be required. Grade beams should span between piles and/or pile caps in accordance with structural requirements.

As no significantly thick, dense sand layer was encountered during our investigation that would provide adequate end bearing support, vertical capacity is based on frictional resistance. We evaluated the allowable vertical capacity for 16-inch diameter APGD piles. As shown in

Figure 10, we have assumed that the top of pile/bottom of pile cap occurs at 4 feet below existing site grades. The allowable capacities are for dead plus live loads; dead loads should not exceed two-thirds of the allowable capacities. The allowable capacities may be increased by one-third for wind and seismic loads. Uplift loads should not exceed 75 percent of the allowable downward vertical capacity under seismic loading. Gross capacity of the piles should be less than the structural capacity of the piles.

7.4.3 Lateral Capacity

Lateral load resistance is developed by the soil's resistance to pile bending. The magnitude of the shear and bending moment developed within the pile are dependent on the pile stiffness, embedment length, the fixity of the pile into the pile cap (free or fixed-head conditions), the surrounding soil properties, the tolerable lateral deflection, and yield moment capacity of the pile.

We utilized the computer program L-Pile to model the load-deflection (p-y) curves representing the soil conditions surrounding the pile, and estimate the ultimate lateral load capacity of the pile. The following table presents the probable response of the piles under short-term loading conditions; the structural engineer should apply an appropriate factor of safety on the shears and moments presented. A cracked (assumed 30 percent reduction) pile stiffness (EI) of 8.1×10^9 lb-in^2 has been assumed in our analysis for 16-inch diameter APGD piles. We also assumed a concrete compressive strength of greater than 4,000 psi for the concrete modulus calculations. If the pile stiffness varies by less than 20 percent of our assumed stiffness, the lateral load parameters below may be interpolated by multiplying the values by the ratio of the different pile stiffness values. We should be retained to re-evaluate the lateral load capacity for piles with stiffnesses significantly different from what was assumed.

Table 6: Ultimate Lateral Load Capacity – 16-Inch Diameter APGD Pile

Pile Type	Fixity Condition	Lateral Deflection (inches)	Maximum Shear (kips)	Maximum Moment (kip-feet)	Depth to Maximum Moment (feet)	Depth to Zero Moment (feet)
16-inch APGD	Free-Head	0.25	16	40	5	16
		0.50	22	63	6	19
16-inch APGD	Fixed-Head	0.25	33	100	0	19
		0.50	45	156	0	21

The above lateral capacities are for single piles and may not be representative of piles in groups. Group effects, including the layout of the piles within a group, can significantly reduce the overall lateral capacity. We should review the pile layout and structural loads and to evaluate what appropriate group efficiency reduction factors should be applied to the different group conditions during the pile design. Dimensions showing the distance between piles and/or coordinates should be provided for the pile layout.

7.4.3.1 Passive Resistance against Pile Caps and Grade Beams

Passive resistance against pile caps and grade beams poured neat against native or engineered fill may also be considered; however, as the allowable lateral deflections of the piles are limited, full allowable passive will not be developed. We should be retained to work with the structural engineer to evaluate appropriate allowable passive pressures that maintain strain compatibility between the piles and pile caps, if additional passive resistance is required.

7.4.3.2 Pre-Production Test Program

One field pile load test should be performed per 150 to 250 piles, at locations throughout the building areas recommended by the geotechnical engineer. Static load tests include installing a test pile, which can either be in a production pile location or not, with four surrounding piles that serve as anchor piles to resist the jacking pressure. During test pile installation, the contractor should allow for monitoring of the pile 10 feet below top of pile and within 5 feet of the pile tip. This can be accomplished either with provisions for telltales or strain gauges. This monitoring will allow for observation of the skin friction as it is mobilized. A member of our staff should be present during test pile installation and testing.

7.4.3.3 Construction Considerations

The installation of all test and production piles should be observed on a full-time basis by a Cornerstone representative to confirm that the piles are constructed in accordance with our recommendations and project requirements. Since the piles will derive their capacity from skin friction, the production piles should be installed to the design tip elevation. The geotechnical project engineer should review the installation records for conformance. We may recommend additional testing of piles, or additional installations, if any pile installations vary from normal installation practices.

We recommend that APG pile contractors have at least 3 years of installation experience in the Bay Area.

7.5 HYDROSTATIC UPLIFT AND WATERPROOFING

Because of the presence of shallow ground water, we expect that deepened improvements, such as elevator pits or other below-grade excavations, may extend below the design ground water level and should be designed to resist potential hydrostatic uplift pressures. Elevator pit walls or other retaining walls extending below design ground water should be waterproofed and designed to resist hydrostatic pressure for the full wall height. Where portions of the walls extend above the design ground water level, a drainage system may be added as discussed in the “Retaining Wall” section, if desired; otherwise the walls should be designed as undrained for the full height. We recommend that a waterproofing specialist design the waterproofing system.

7.6 SPREAD FOOTINGS FOR SURFACE IMPROVEMENTS

Spread footings for surface improvements such as trash enclosures, seat walls, and other landscaping improvements should bear on natural, undisturbed soil or engineered fill, be at least 12 inches wide, and extend at least 24 inches below the lowest adjacent grade. Lowest adjacent grade is defined as the deeper of the following: 1) bottom of the adjacent interior slab-on-grade, or 2) finished exterior grade, excluding landscaping topsoil. The deeper footing embedment is due to the presence of moderately [to highly] 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 mats of reinforcing steel should be included in continuous footings to help span irregularities and differential settlement.

Lightly loaded landscape improvements are anticipated to have total static footing settlements of less than about ½-inch.

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 0.40 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.

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.

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 39, the proposed slabs-on-grade should be supported on at least 24 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 slab-on-grade NEF construction, the subgrade should be proof-rolled to confirm subgrade stability, and if the soil has been allowed to dry out, the subgrade should be re-moisture conditioned to at least 3 percent over the optimum moisture content.

The structural engineer should determine the appropriate slab reinforcement for the loading requirements and considering the expansion potential of the underlying soils. 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.

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 ½- to ¾-inch crushed rock with less than 5 percent passing the No. 200 sieve, should be placed below the vapor retarder and consolidated in place with vibratory equipment. 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 on at least 12 inches of non-expansive fill, with at least the upper 4 inches consisting of Class 2 aggregate base 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 or retaining walls except where limited sections of structural slabs are included to help span irregularities in retaining wall backfill at the transitions between at-grade and on-structure flatwork.

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 soil types encountered at the site and engineering judgment considering the variable surface conditions. We have also included pavement structural section alternatives for lime-treated subgrade soil with an estimated design R-value of 50 for your consideration. If it is desired to lime-treat the proposed auto parking and truck parking/loading areas to reduce the pavement section, we recommend that the upper 12 inches of expansive clay subgrade soil be treated, as discussed in the "Earthwork" section of this report.

Table 7: Asphalt Concrete Pavement Recommendations, Design R-value = 5

Design Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base* (inches)	Total Pavement Section Thickness (inches)
4.0	2.5	7.5	10.0
4.5	2.5	9.0	11.5
5.0	3.0	10.0	13.0
5.5	3.0	11.5	14.5
6.0	3.5	12.0	15.5
6.5	4.0	12.0	16.0

*Caltrans Class 2 aggregate base; minimum R-value of 78

Table 8: Asphalt Concrete Pavement Recommendations (Lime-Treated Subgrade)

Design Traffic Index (TI)	Asphalt Concrete (inches)	Class 2 Aggregate Base* (inches)	Total Pavement Section Thickness (inches)
4.0	2.5	4.0	6.5
4.5	2.5	4.0	6.5
5.0	3.0	4.0	7.0
5.5	3.0	4.0	7.0
6.0	3.5	4.0	7.5
6.5	3.5	4.5	8.0

* Caltrans Class 2 aggregate base or recycled crushed concrete with a minimum R-value of 78; minimum lime-treated subgrade R-value assumed to be 50

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 be 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. 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 exterior Portland Cement Concrete (PCC) pavement recommendations tabulated below are based on methods presented in the Portland Cement Association (PCA) design manual (PCA, 1984). Recommendations for garage slabs-on-grade were provided in the “Concrete Slabs and Pedestrian Pavements” section above. We have provided a few pavement alternatives as an anticipated Average Daily Truck Traffic (ADTT) was not provided. An allowable ADTT should be chosen that is greater than what is expected for the development.

Table 9: PCC Pavement Recommendations, Design R-value = 5

Allowable ADTT	Minimum PCC Thickness (inches)
13	5½
130	6

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. Due to the expansive surficial soils present, we recommend that the construction and expansion joints be dowelled.

9.2.1 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 7 inches. The compressive strength, underlayment, and construction details should be consistent with the above recommendations for PCC pavements.

9.3 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 reduce 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 6 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 10: Recommended Lateral Earth Pressures

Wall Condition	Lateral Earth Pressure*	Additional Surcharge Loads
Unrestrained – Cantilever Wall	45 pcf	⅓ of vertical loads at top of wall
Restrained – Braced Wall	45 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 2013 CBC states that lateral pressures from earthquakes should be considered in the design of basements and retaining walls. At this time, we are not aware of any retaining walls for the project. However, minor landscaping walls or bridge abutment (i.e. walls 6 feet or less in height) may be proposed. In our opinion, design of these walls for seismic lateral earth pressures in addition to static earth pressures is not warranted.

10.3 AT-GRADE SITE 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, 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 Sequoia Union High School District specifically to support the design of the new small high school campus project located at 150 Jefferson Drive in Menlo Park, 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.

Sequoia Union High School District may have provided Cornerstone with plans, reports and other documents prepared by others. Sequoia Union High School District 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

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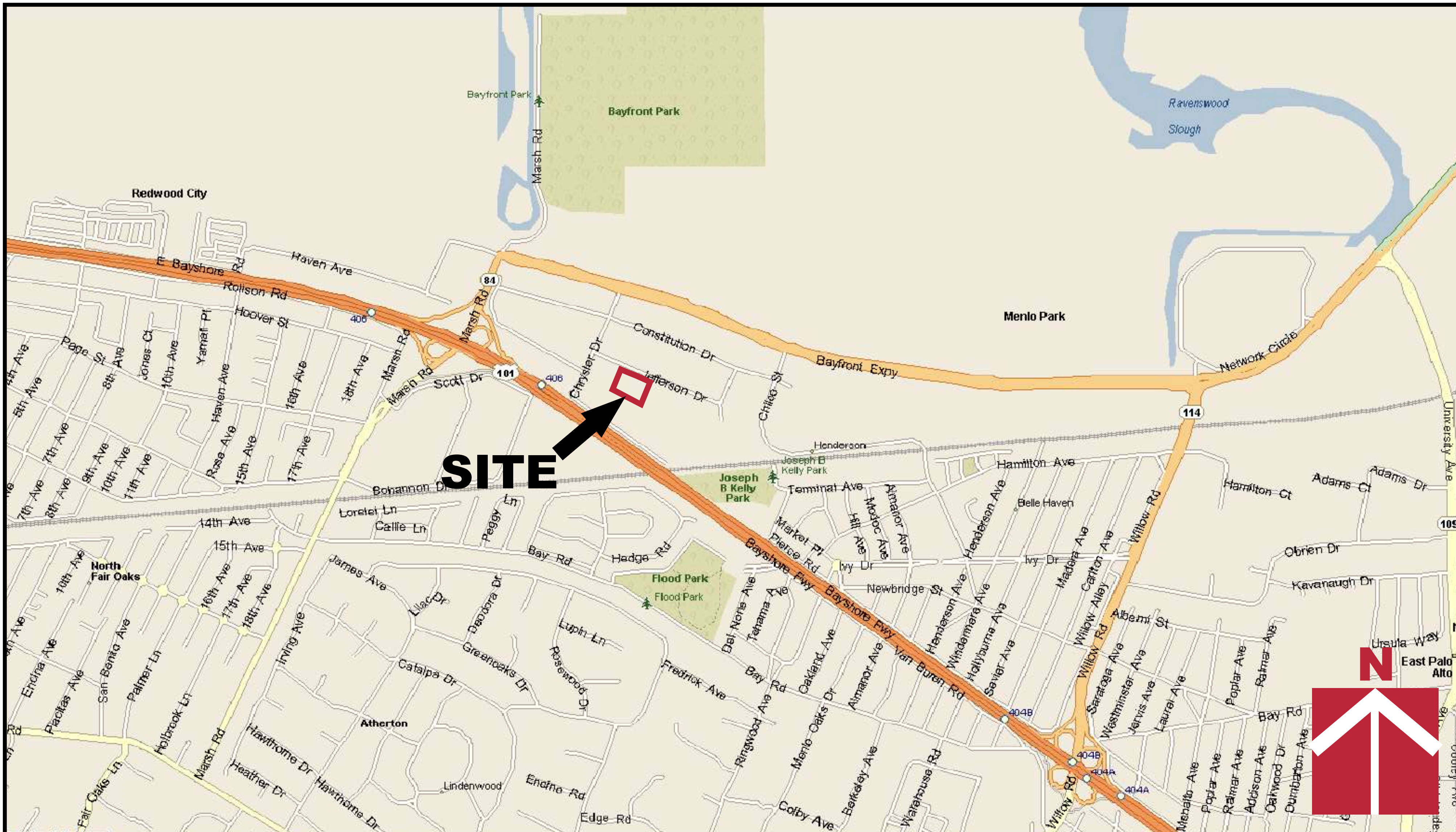
Aerial Photographs Reviewed:

Date	Type
1948	vertical black & white
1956	vertical black & white
1958	vertical black & white
1960	vertical black & white
1968	vertical black & white
1980	vertical black & white
1991	vertical black & white
1993	vertical black & white
1998	vertical black & white
2002	vertical black & white
2009	vertical black & white
2012	vertical black & white



CORNERSTONE EARTH GROUP	Vicinity Map	Project Number	166-14-9
	150 Jefferson Drive Menlo Park, CA	Figure Number	Figure 1
		Date: March 2016	Drawn By: RRN

Geologic Units

Qaf Alluvial fan deposits (Pleistocene)

Legend

Approximate location of exploratory boring (EB) (Cornerstone, 2014)

Approximate location of cone penetration test (CPT) (Cornerstone, 2014)

Approximate location of exploratory boring (EB) (Cornerstone, 2016)

A A' Approximate location of cross section

0 40 80
APPROXIMATE SCALE (FEET)

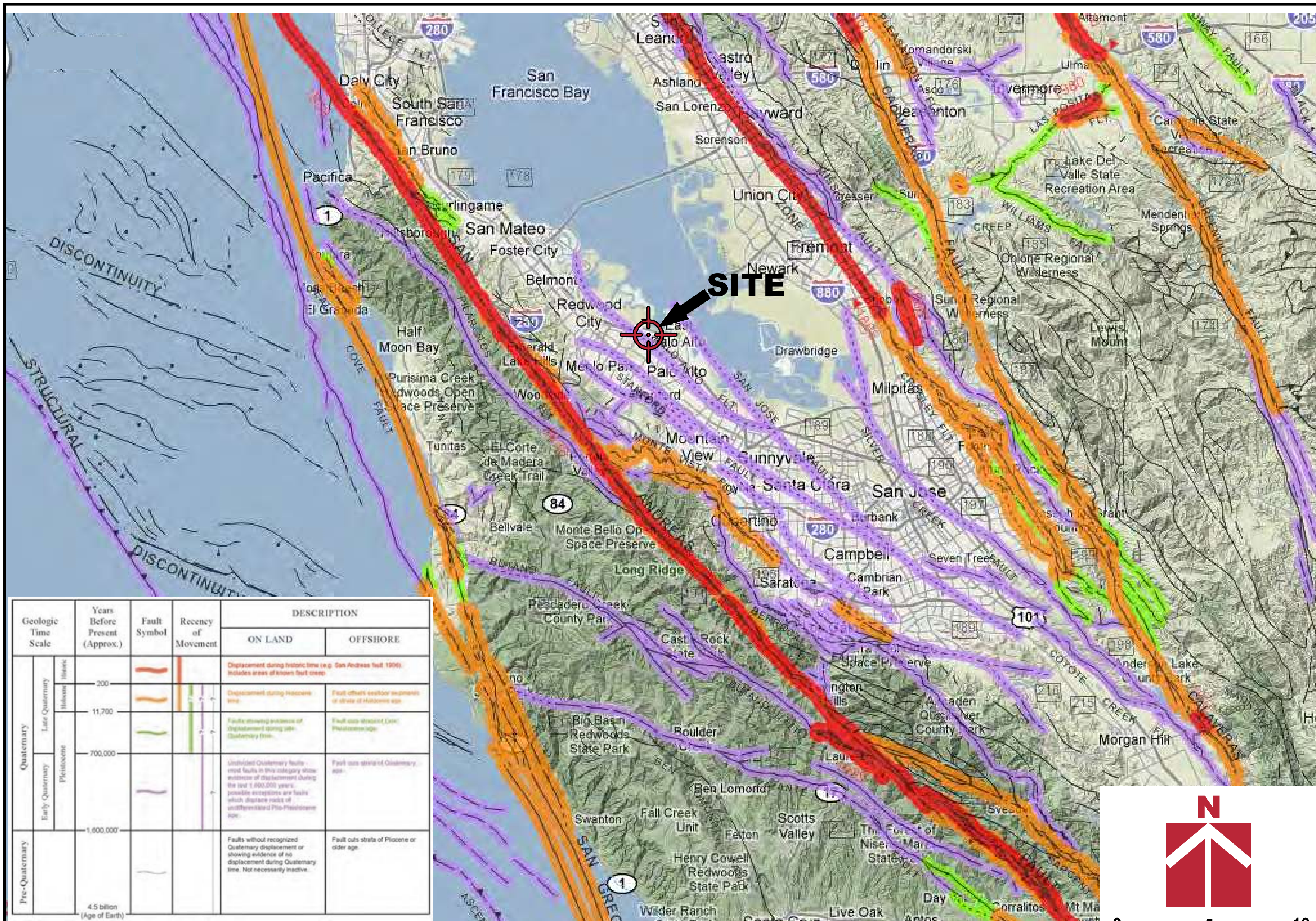
Base by Google Earth, dated 2/23/2014
Overlay by TRA, Conceptual Site Plan - Figure 3, undated

CORNERSTONE EARTH GROUP

Site Plan and Geologic Map

150 Jefferson Drive
Menlo Park, CA

Project Number	166-14-9
Figure Number	Figure 2
Date	March 2016
Drawn By	RRN



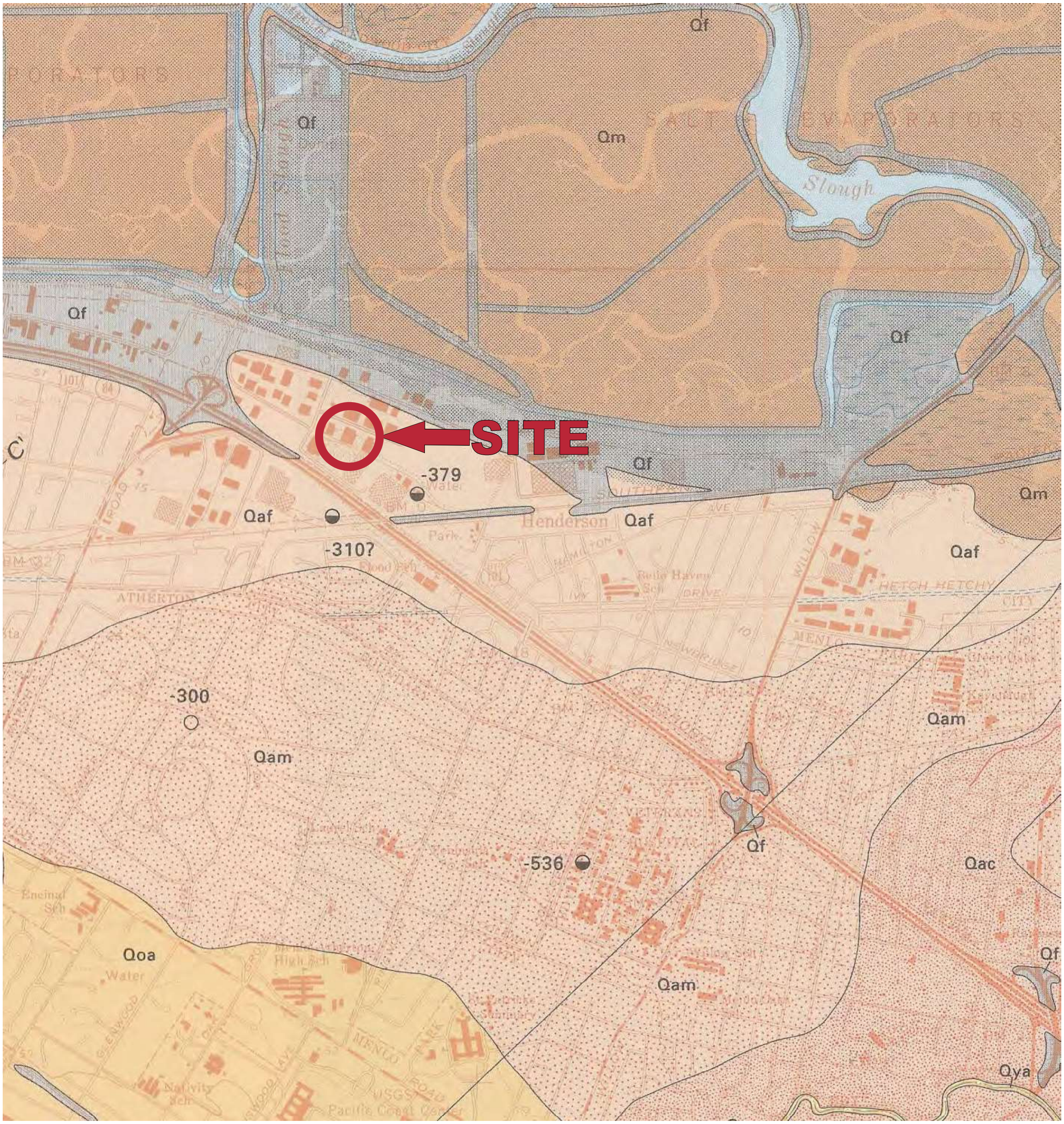
Base by California Geological Survey - 2010 Fault Activity Map of California (Jennings and Bryant, 2010)

CORNERSTONE EARTH GROUP

Regional Fault Map

150 Jefferson Drive
Menlo Park, CA

Project Number	Figure Number	Date	Drawn By
166-14-9	Figure 3	March 2016	RRN



Geologic Units

Qf Artificial Fill (Holocene)

Qm Bay Mud

Qaf Fine-grained Alluvium (Holocene)

Explanation

Contact- dashed where approximate, dotted where concealed

N

0 2000 4000

APPROXIMATE SCALE (FEET)

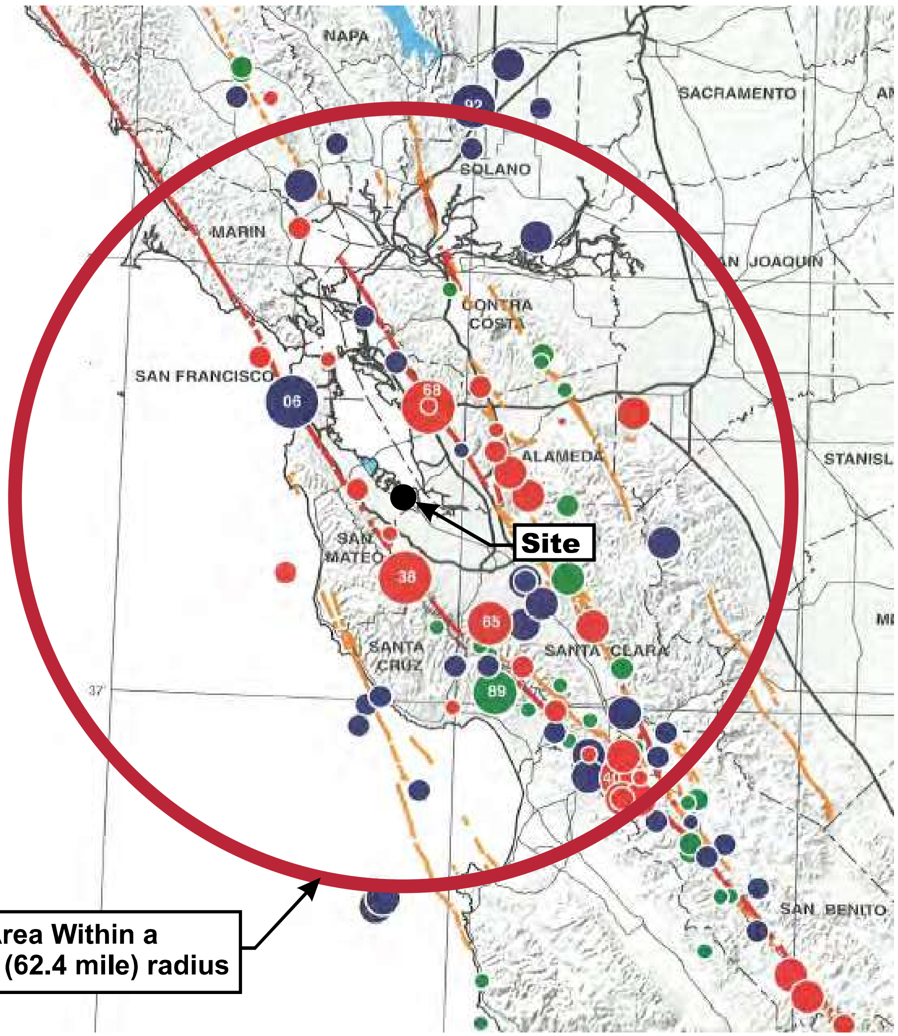
Base by Earl H. Pampeyan, dated 1993, Palo Alto and Part of Redwood Point 7½' Quadrangles.

CORNERSTONE EARTH GROUP

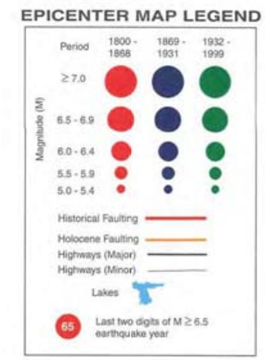
Vicinity Geologic Map

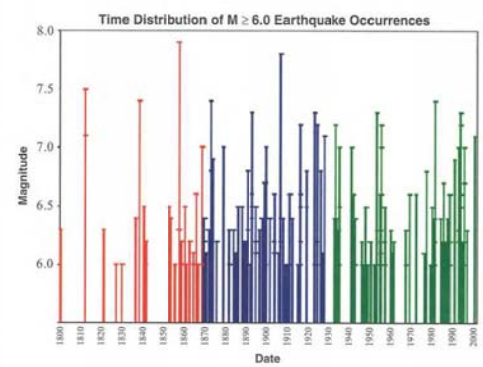
150 Jefferson Drive
Menlo Park, CA

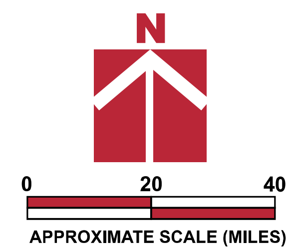
Project Number	166-14-9
Figure Number	Figure 4
Date	March 2016
Drawn By	RRN



Area Within a 100km (62.4 mile) radius

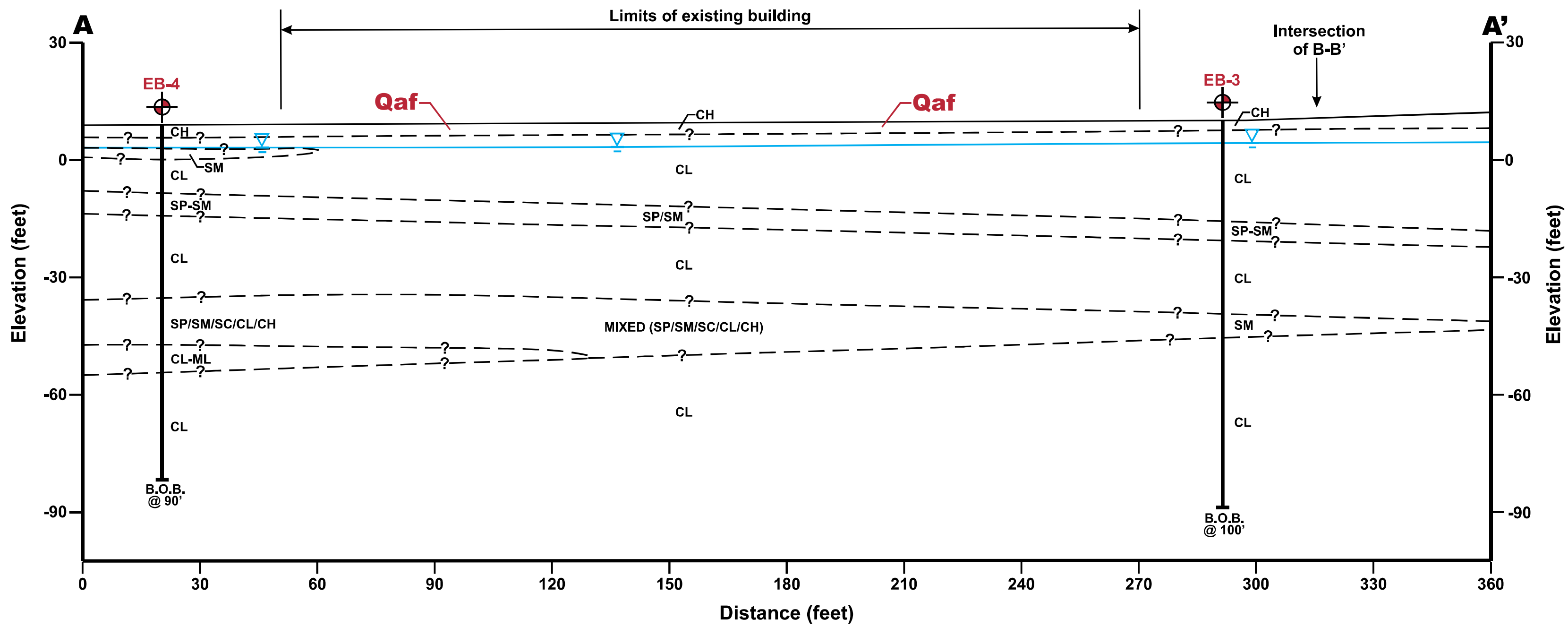






From: T. Toppozada & Others (2000)

CORNERSTONE EARTH GROUP	
Historical Earthquakes Map	
150 Jefferson Drive Menlo Park, CA	
Project Number	166-14-9
Figure Number	Figure 5
Date	March 2016
Drawn By	RRN



Section A-A'
(View Looking Northeast)
1"=30' H:V

Symbols

⊕	Approximate location of exploratory boring (EB)
CL	Lean Clay or sandy clay
CH	Fat Clay
SC	Clayey Sand
SM	Silty Sand
CL-ML	Lean Clay with Silt
SP-SM	Poorly Graded Sand with Silt
∇	Approximate ground water depth at time of drilling; actual depth may vary

Geologic Units

Qaf Alluvial fan deposits (Pleistocene)

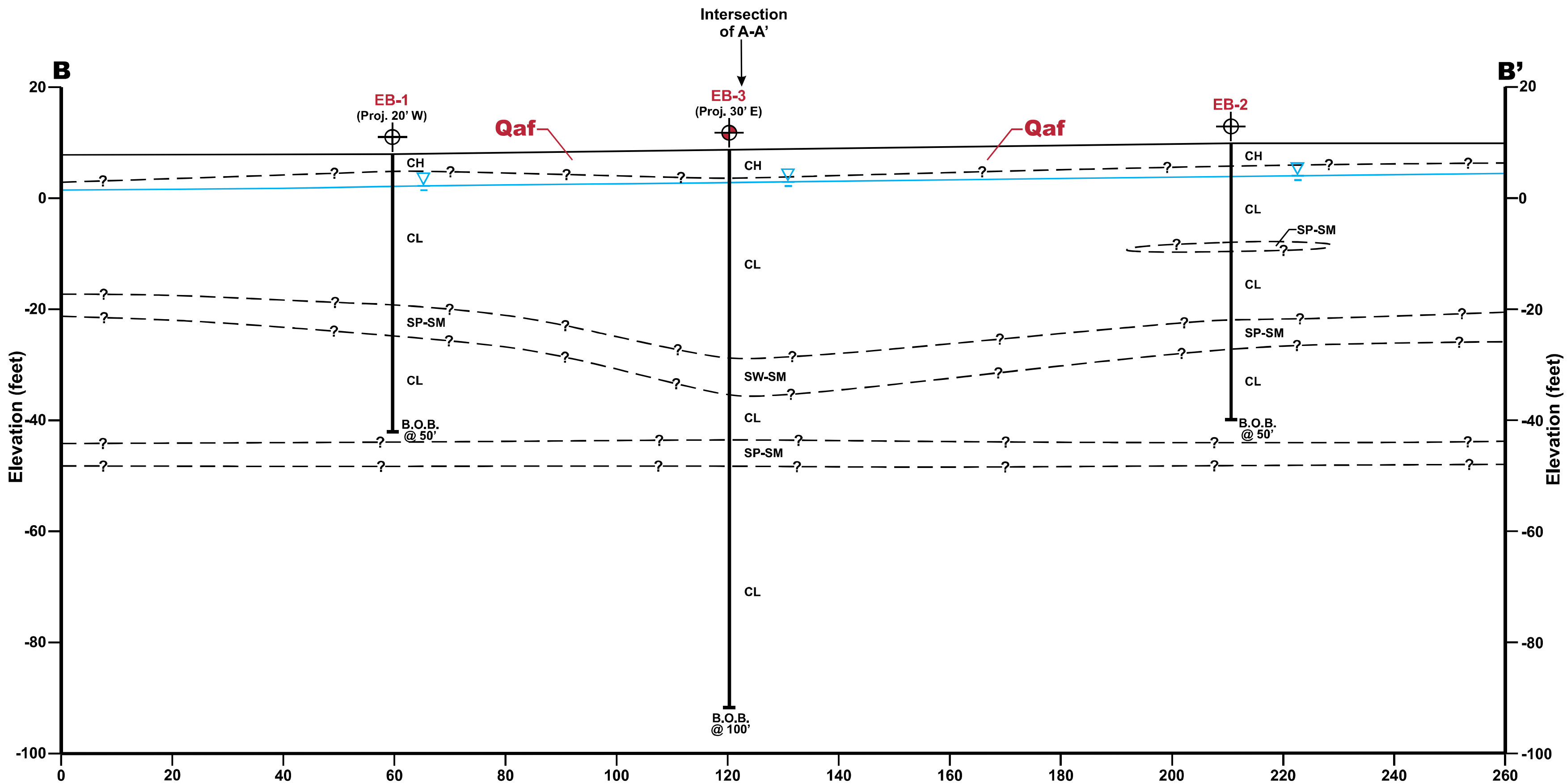
Notes:
1) Surficial fills associated with existing pavements, landscaping or utilities are not shown.
2) The subsurface profile is conceptual and is based on limited subsurface data obtained from widely spaced borings. Actual subsurface conditions may vary significantly between borings.
3) See Figure 2 for location of cross section.

CORNERSTONE EARTH GROUP

Geologic Cross Section A-A'

150 Jefferson Drive
Menlo Park, CA

Project Number	Figure Number	Date	Drawn By
166-14-9	Figure 6	March 2016	RRN



Section B-B'
(View Looking Southeast)
1"=20' H:V

Symbols

- Approximate location of exploratory boring (EB)
- Approximate location of exploratory boring (EB) (Cornerstone, 2014)
- CL Lean Clay or sandy clay
- CH Fat Clay
- SW-SM Well Graded Sand with Silt
- SP-SM Poorly Graded Sand with Silt
- Approximate ground water depth at time of drilling; actual depth may vary

Geologic Units

Qaf Alluvial fan deposits (Pleistocene)

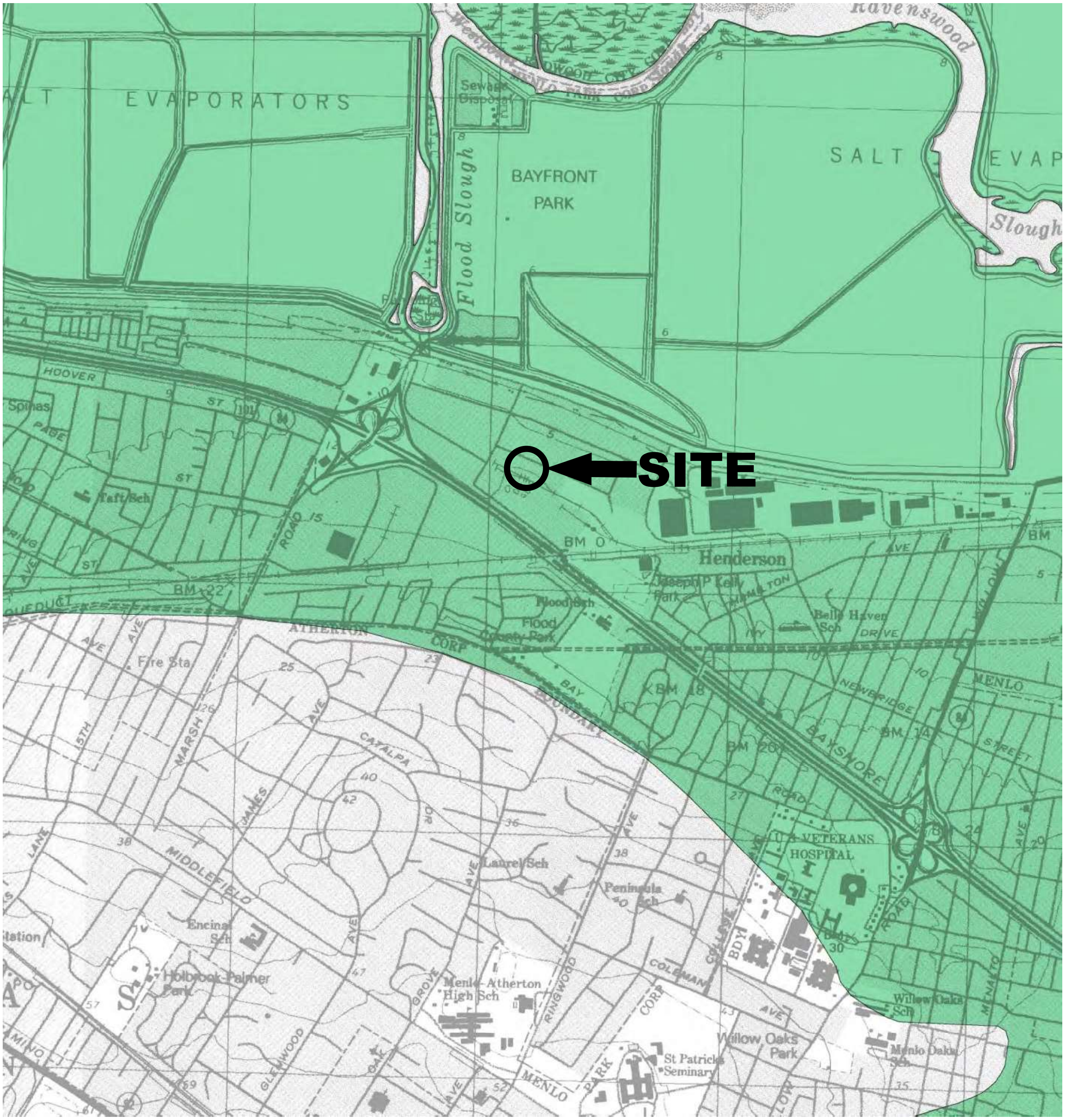
Notes:
1) Surficial fills associated with existing pavements, landscaping or utilities are not shown.
2) The subsurface profile is conceptual and is based on limited subsurface data obtained from widely spaced borings. Actual subsurface conditions may vary significantly between borings.
3) See Figure 2 for location of cross section.

CORNERSTONE EARTH GROUP

Geologic Cross Section B-B'

150 Jefferson Drive
Menlo Park, CA

Project Number 166-14-9
Figure Number Figure 7
Date March 2016
Drawn By RRN



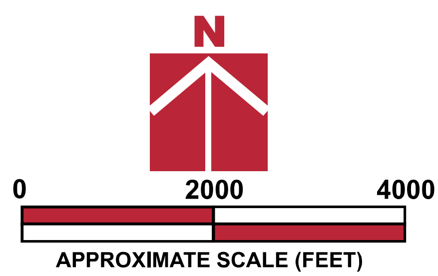
Explanation

Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslides

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.



Base by State of California, Seismic Hazard Zones, Palo Alto Quadrangle.

CORNERSTONE EARTH GROUP	Seismic Hazard Map	Project Number 166-14-9
	150 Jefferson Drive Menlo Park, CA	Figure Number Figure 8
		Date March 2016 / Drawn By RRN

CORNERSTONE EARTH GROUP

FIGURE 4A

CPT NO. 1

PROJECT/CPT DATA

Project Title	**150 Jefferson Drive**
Project No.	**166-14-9**
Project Manager	**SEF**

SEISMIC PARAMETERS

Controlling Fault	**San Andreas**	
Earthquake Magnitude (Mw)	**7.9**	
PGA (Amax)	**0.64**	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	**6**
Design Water Depth (feet)	**5**
Ave. Unit Weight Above GW (pcf)	**125**
Ave. Unit Weight Below GW (pcf)	**120**

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM 5 **FEET**

0.00 **(Inches)**

LIQUEFACTION SETTLEMENT FROM 50 **FEET**

0.20 **(Inches)**

TOTAL SEISMIC SETTLEMENT 0.2 **INCHES**

POTENTIAL LATERAL DISPLACEMENT

LDI[2] 0.00 **L/H** 80.0

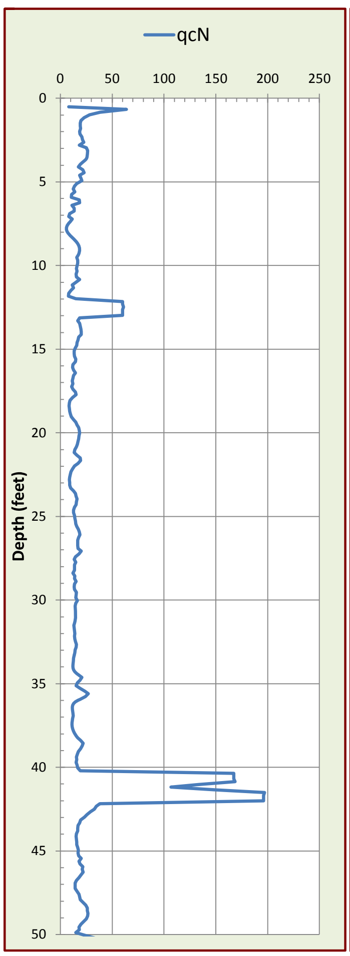
LDI[1] Corrected for Distance 0.00 (4 < L/H < 40)

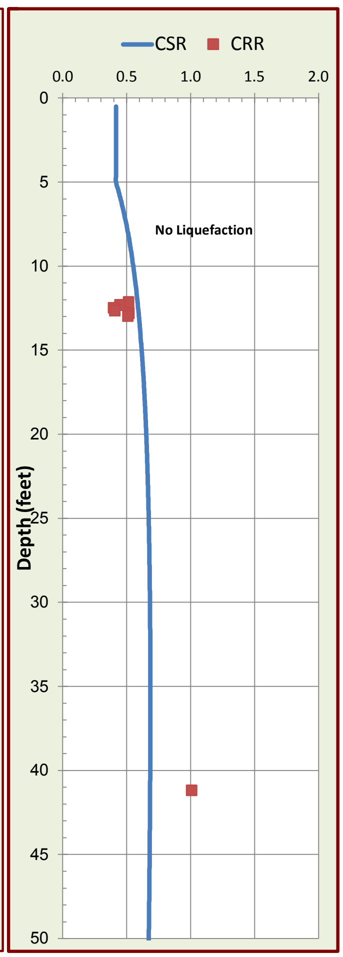
EXPECTED RANGE OF DISPLACEMENT

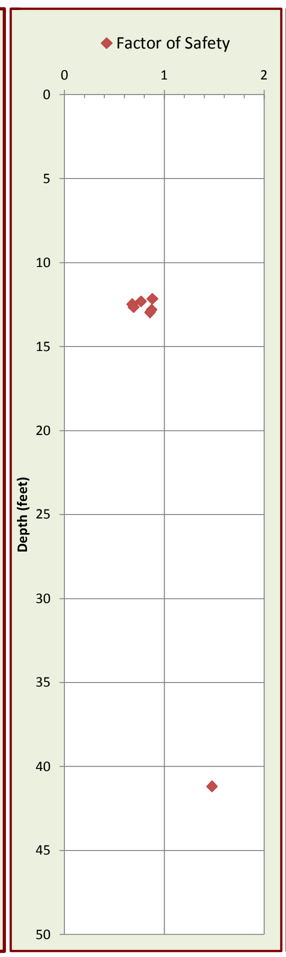
0.0 **to** **0.0** **feet**

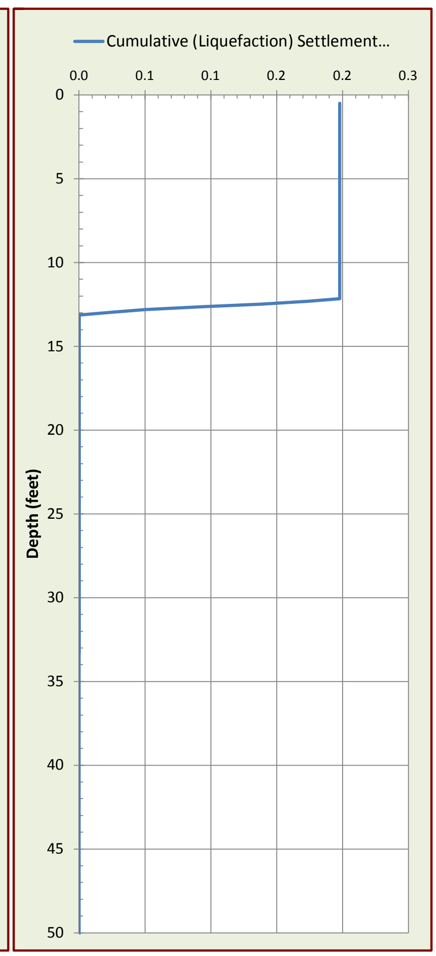
[1]Not Valid for L/H Values < 4 and > 40.

[2]LDI Values Only Summed to 2H Below Grade.









CORNERSTONE EARTH GROUP

FIGURE 4B

CPT NO. 2

PROJECT/CPT DATA

Project Title	**Jefferson Drive**
Project No.	**166-14-3**
Project Manager	**SEF**

SEISMIC PARAMETERS

Controlling Fault	**San Andreas**	
Earthquake Magnitude (Mw)	**7.9**	
PGA (Amax)	**0.64**	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	**6**
Design Water Depth (feet)	**5**
Ave. Unit Weight Above GW (pcf)	**125**
Ave. Unit Weight Below GW (pcf)	**120**

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM 5 **FEET**

0.00 **(Inches)**

LIQUEFACTION SETTLEMENT FROM 50 **FEET**

0.59 **(Inches)**

TOTAL SEISMIC SETTLEMENT 0.6 **INCHES**

POTENTIAL LATERAL DISPLACEMENT

LDI[2] 0.00 **L/H** 0.0

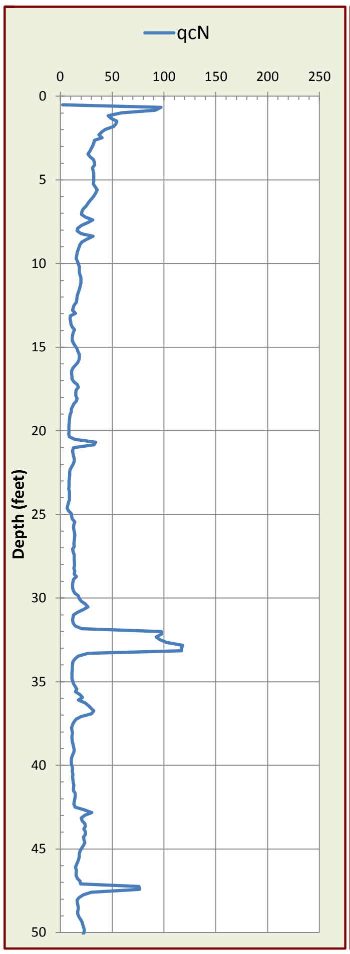
LDI[1] **Corrected for Distance** 0.00 (4 < L/H < 40)

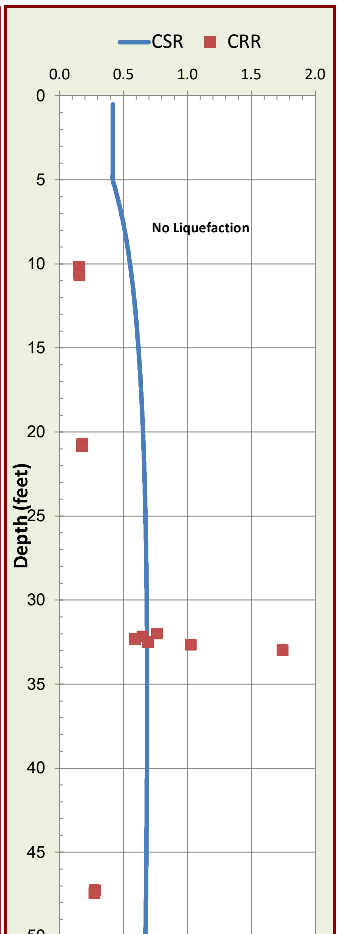
EXPECTED RANGE OF DISPLACEMENT

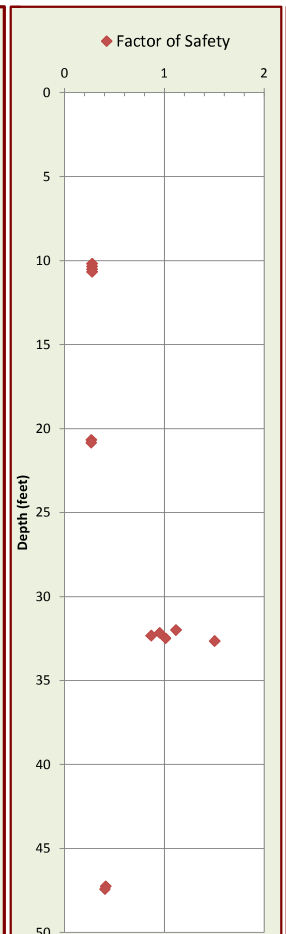
0.0 **to** 0.0 **feet**

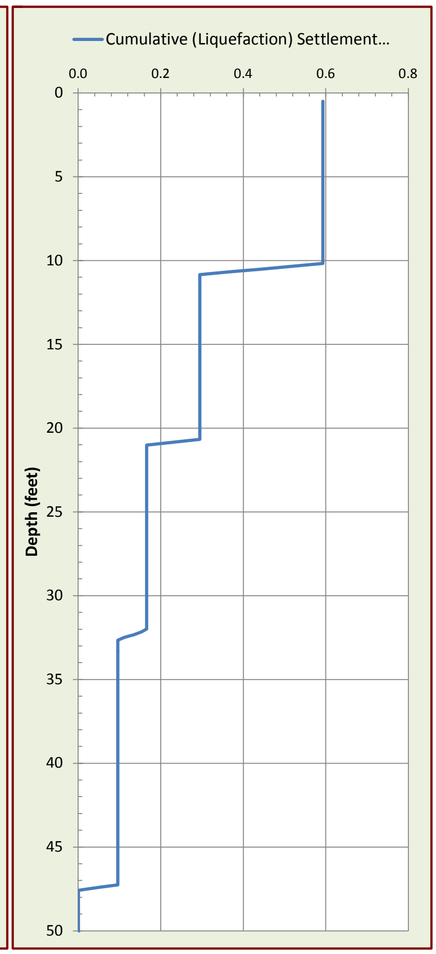
[1]Not Valid for L/H Values < 4 and > 40.

[2]LDI Values Only Summed to 2H Below Grade.









CORNERSTONE EARTH GROUP

FIGURE	4C
CPT NO.	3

PROJECT/CPT DATA

Project Title	Jefferson Drive
Project No.	166-14-3
Project Manager	SEF

SEISMIC PARAMETERS

Controlling Fault	San Andreas	
Earthquake Magnitude (Mw)	7.9	
PGA (Amax)	0.64	(g)

SITE SPECIFIC PARAMETERS

Ground Water Depth at Time of Drilling (feet)	6
Design Water Depth (feet)	5
Ave. Unit Weight Above GW (pcf)	125
Ave. Unit Weight Below GW (pcf)	120

CPT ANALYSIS RESULTS

DRY SAND SETTLEMENT FROM 5 FEET

0.01 (Inches)

LIQUEFACTION SETTLEMENT FROM 50 FEET

0.91 (Inches)

TOTAL SEISMIC SETTLEMENT 0.9 INCHES

POTENTIAL LATERAL DISPLACEMENT

LDI[2] 0.00 L/H 0.0

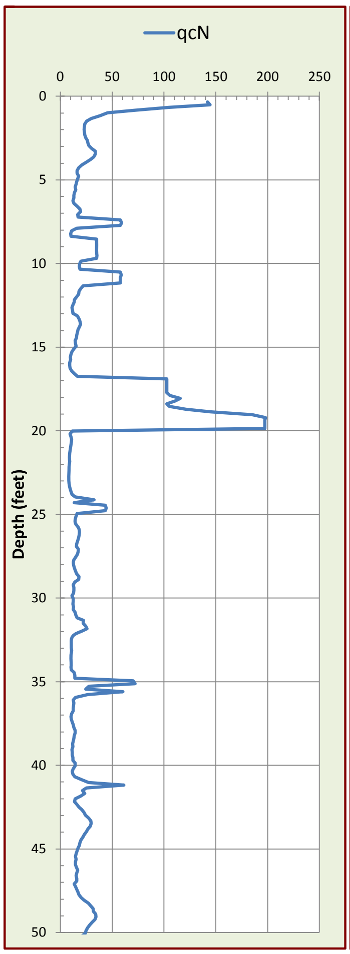
LDI[1] Corrected for Distance 0.00 (4 < L/H < 40)

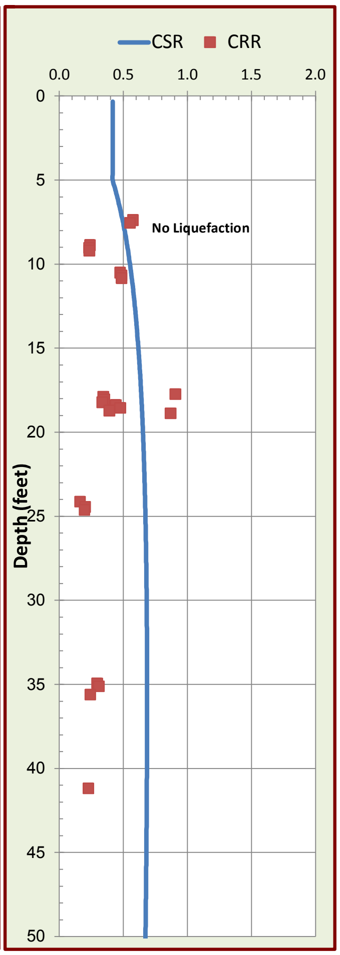
EXPECTED RANGE OF DISPLACEMENT

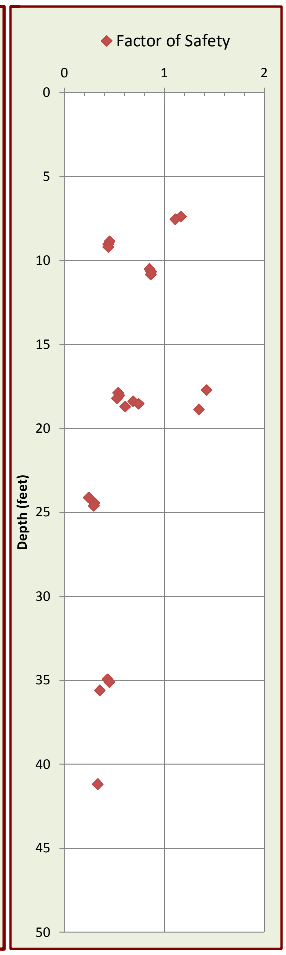
0.0 to 0.0 feet

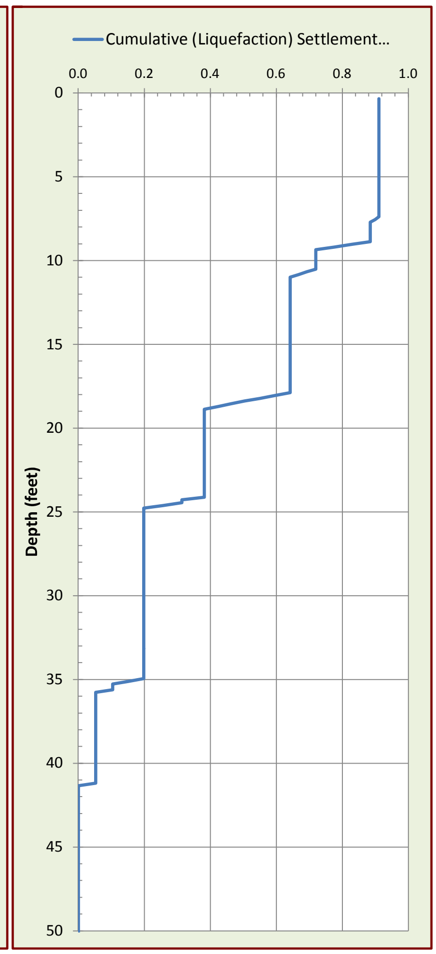
[1]Not Valid for L/H Values < 4 and > 40.

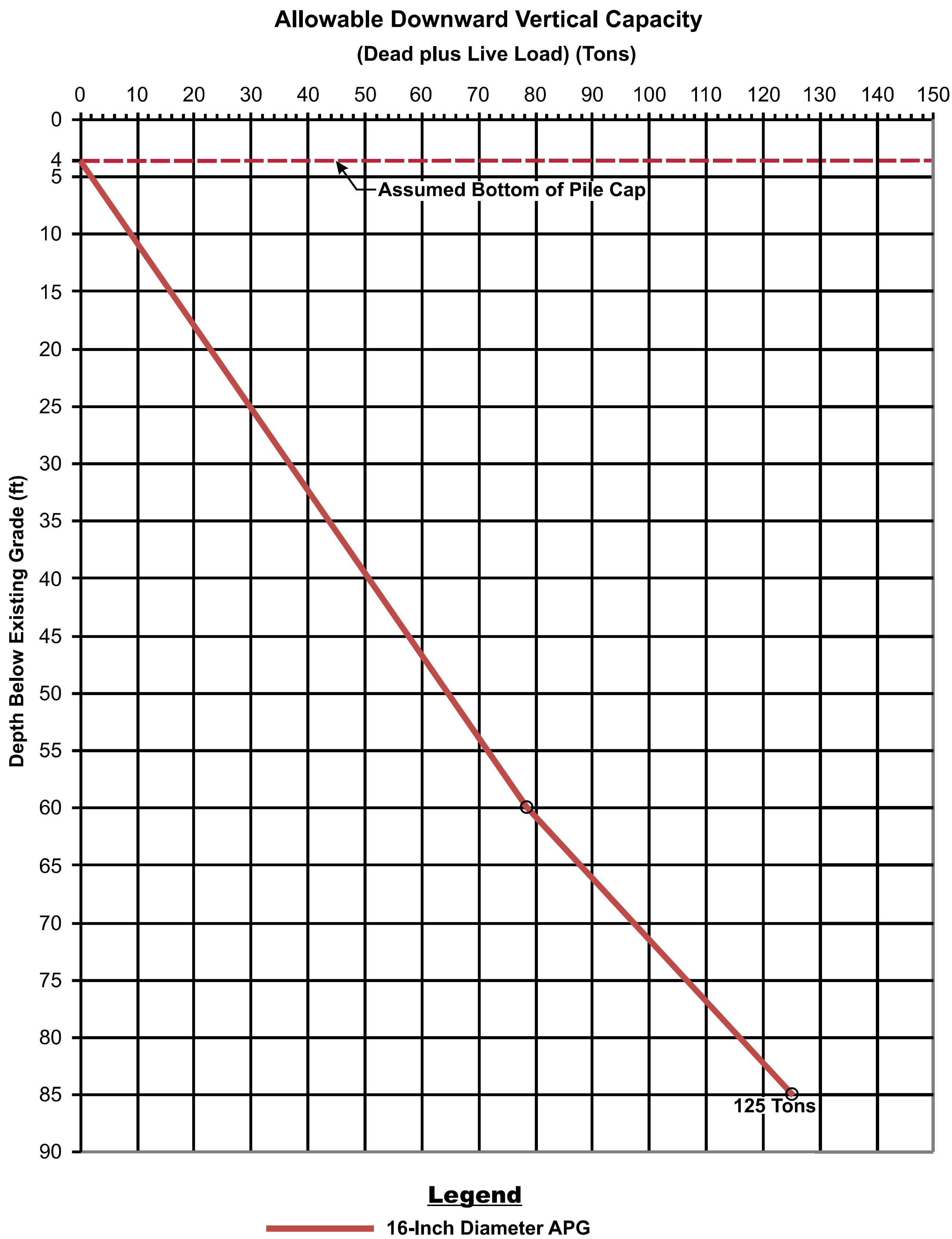
[2]LDI Values Only Summed to 2H Below Grade.











CORNERSTONE EARTH GROUP

Vertical Pile Capacity

150 Jefferson Drive
Menlo Park, CA

Project Number	166-14-9
Figure Number	Figure 10
Date	March 2016
Drawn By	RRN

APPENDIX C:

JUNE 2016 TRAFFIC IMPACT ANALYSIS

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Menlo Park Small High School Project

Traffic Impact Analysis

Prepared for:

Sequoia Union High School District

June 28, 2016

Hexagon Office: 8070 Santa Teresa Boulevard, Suite 230
Gilroy, CA 95020
Hexagon Job Number: 15GD01
Phone: 408.846.7410
Client Name: MIG|TRA Environmental Sciences, Inc.

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Executive Summary

This report presents the results of the transportation impact analysis (TIA) conducted for the proposed Menlo Park Small High School in the City of Menlo Park, California. The proposed new high school would be part of the Sequoia Union High School District (SUHSD). The project site is located at 150 Jefferson Drive and consists of an approximately 2.1-acre site. The project site is within the general area surrounded by Bayfront Expressway (SR 84) to the northeast, Dumbarton rail corridor to the south, US 101 to the southwest, and Marsh Road to the north. Currently, an approximately 44,000 square-foot building occupies the site and serves as the corporate headquarters and sales office for Bay Associates Wireless Technologies, a cable and cable assemblies business. The existing facilities on site are proposed to be demolished and replaced with a new school campus. The new school, as proposed, would serve up to 400 students in the grades 9 to 12 with 35 faculty/staff members. The school would be in session from 8:15-8:30 AM to 3:30-3:45 PM during the traditional school year, with summer school offerings as well.

Scope of Study

This study was conducted for the purpose of identifying the potential traffic impacts related to the proposed school project. The potential impacts related to the proposed school were evaluated following the standards and methodologies set forth by the City of Menlo Park, the City/County Association of Governments (C/CAG) of San Mateo County, and Caltrans. C/CAG administers the County Congestion Management Program (CMP) while Caltrans has jurisdiction over some of the study facilities.

The study includes an analysis of five signalized intersections, six unsignalized intersections, six local roadway segments, three CMP roadway segments, and one freeway interchange, all of them located within the City of Menlo Park. The study also includes a site access and on-site circulation analysis, and an evaluation of the proposed parking and drop-off and pick-up activities on-site.

Study Intersections

1. Bayfront Expressway and Marsh Road* (State)
2. Constitution Drive and Independence Drive - Unsignalized (City of Menlo Park)
3. US 101 NB Ramps and Marsh Road (State)
4. US 101 SB Ramps and Marsh Road (State)
5. Bayfront Expressway and Chrysler Drive (State)
6. Constitution Drive and Chrysler Drive - Unsignalized (City of Menlo Park)
7. Jefferson Drive and Chrysler Drive - Unsignalized (City of Menlo Park)
8. Independence Drive and Chrysler Drive - Unsignalized (City of Menlo Park)
9. Constitution Drive and Jefferson Drive - Unsignalized (City of Menlo Park)
10. Bayfront Expressway and Chilco Street - (State)
11. Constitution Drive and Chilco Street - Unsignalized (City of Menlo Park)

*Denotes CMP intersection

(Intersection jurisdiction in parenthesis)

Study Roadway Segments

1. Jefferson Drive, south of Chrysler Drive
2. Chrysler Drive, between Jefferson Drive and Constitution Drive
3. Chrysler Drive, between Constitution Drive and Bayfront Expressway
4. Independence Drive, north of Chrysler Drive
5. Constitution Drive, between Jefferson Drive and Chilco Street
6. Chilco Street, between Constitution Drive and Bayfront Expressway

Study Routes of Regional Significance

1. US 101, north of Marsh Road
2. US 101, south of Marsh Road
3. Bayfront Expressway (SR 84), from US 101 to Willow Road (SR 14)

Study Freeway Interchange

US 101 northbound off-ramp to Marsh Road
US 101 northbound on-ramp from westbound Marsh Road
US 101 southbound off-ramp to Marsh Road
US 101 southbound on-ramp from westbound Marsh Road

Study Time Periods

The proposed school hours of operation are Monday through Friday 8:15-8:30 AM to 3:30-3:45 PM. Therefore, traffic conditions at the study intersections were analyzed for the weekday AM and PM peak hours of traffic. The weekday AM peak-hour of traffic is typically one hour between 7:00 and 9:00 AM and the PM peak-hour is typically one hour between 4:00-6:00 PM. Although the school day would be over before 4:00 PM, as a conservative approach, it was assumed that school traffic associated with the end of the day dismissal would be on the roadway during the PM peak hour, providing a worst case traffic conditions.

Study Scenarios

Traffic conditions were evaluated for the following scenarios:

Scenario 1: *Existing Conditions.* Existing conditions represent existing traffic volumes on the existing roadway network.

Scenario 2: *Existing Plus Project Conditions.* Existing plus project peak hour traffic volumes were estimated by adding to existing traffic volumes the additional traffic generated by the project.

Scenario 3: *Near Term Conditions.* Near term traffic conditions were estimated by adding to existing peak hour volumes the projected volumes from approved but not yet completed developments in the City of Menlo Park and applying a one percent growth factor to the existing traffic volumes.

Scenario 4: *Near Term Plus Project Conditions.* Near term plus project conditions, or simply referred to as *Project Conditions*, were estimated by adding to the near term traffic volumes the additional traffic estimated to be generated by the proposed project.

Scenario 5: *Cumulative Conditions.* Cumulative conditions traffic volumes were estimated by adding to existing peak hour volumes the projected volumes from approved and pending projects in the City of Menlo Park and applying an annual growth factor of 1% for ten years to the existing traffic volumes.

Project Trip Generation

The school is proposing to begin operations in August 2018 with a 100-freshman class, and increase its size by 100 new freshman students each year thereafter until the maximum student enrollment of 400 students (2021-2022 school year) is reached. For this reason, near term plus project conditions were evaluated under two project scenarios:

- Year 2018 (school opening year/100 students) project conditions
- Year 2021 (maximum student enrollment/400 students) project conditions

The trips generated by the proposed school were estimated based on trip generation counts conducted at Everest High School. The magnitude of traffic added to the roadway system by the proposed project was estimated by multiplying the proposed number of student by the surveyed Everest High School trip generation rates. Based on the surveyed rates, it is estimated that the proposed 100-student school would generate a total of approximately 88 trips (50 inbound and 38 outbound) during the AM peak hour and 51 trips (22 inbound and 29 outbound) during the PM peak hour while the 400-student school would generate a total of approximately 354 trips (202 inbound and 152 outbound) during the AM peak hour and 206 trips (91 inbound and 115 outbound) during the PM peak hour. This represents the peak-hour traffic projected to be generated by the proposed project (gross project trips) at the school's schools opening year (year 2018) and at full capacity (year 2021).

After reduction of the existing site trips, the proposed 100-student school is projected to generate a net total of 56 AM peak hour trips (25 inbound and 31 outbound) and 19 PM peak hour trips (10 inbound and 9 outbound) while the 400-student school project is estimated to generate a net total of 322 AM peak hour trips (177 inbound and 145 outbound) and 174 PM peak hour trips (79 inbound and 95 outbound).

Near Term Plus Project Conditions Analysis

Intersection levels of service were evaluated against City of Menlo Park and Caltrans Level of Service standards. The intersection levels of service under near term project conditions are summarized in Table ES1.

City of Menlo Park Intersections

The results of the level of service analysis show that, measured against the City of Menlo Park level of service policy, the proposed 100-student school scenario would have a negative impact on the following study intersections:

2. Constitution Drive and Independence Drive - (Impact - AM peak hour)
3. US 101 NB Ramps and Marsh Road - (Impact – AM & PM peak hours)
4. US 101 SB Ramps and Marsh Road – (Impact – AM peak hour)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
6. Constitution Drive and Chrysler Drive - (Impact - AM & PM peak hours)
7. Jefferson Drive and Chrysler Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - PM peak hour)
11. Constitution Drive and Chilco Street - (Impact – AM & PM peak hours)

The proposed 400-student school scenario would have a negative impact on the following study intersections:

2. Constitution Drive and Independence Drive - (Impact - AM peak hour)
3. US 101 NB Ramps and Marsh Road - (Impact - AM and PM peak hours)

4. US 101 SB Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
6. Constitution Drive and Chrysler Drive - (Impact - AM & PM peak hours)
7. Jefferson Drive and Chrysler Drive - (Impact - PM peak hour)
8. Independence Drive and Chrysler Drive - (Impact - PM peak hour)
9. Constitution Drive and Jefferson Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - PM peak hour)
11. Constitution Drive and Chilco Street - (Impact - AM & PM peak hours)

Caltrans Intersections

The results of the level of service analysis show that, measured against LOS D standard, the proposed 100-student school scenario would have a negative impact on the following Caltrans intersection:

1. Bayfront Expressway and Marsh Road - (Impact - AM peak hour)

The proposed 400-student school scenario would have a negative impact on the following Caltrans intersections:

1. Bayfront Expressway and Marsh Road - (Impact - AM & PM peak hours)
3. US 101 Northbound Ramps and Marsh Road - (Impact - AM & PM peak hours)
4. US 101 Southbound Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)

Intersection Mitigation Measures under 2018 and 2021 Project Conditions

Described below are the intersection impacts that are projected to occur under both project conditions scenarios analyzed and possible intersection mitigation improvements. However, their feasibility has yet to be determined by the lead agency (City of Menlo Park or Caltrans). Subsequent detailed analyses of the improvements, in conjunction with the implementation of other approved projects in the area, is needed to determine the feasibility of each of the improvements below. Such reviews may show that the full intersection improvements, as described below, are not feasible due to right-of-way constraints, detrimental impacts to non-auto modes, or other environmental impacts. If the full intersection improvements are not implemented or if there are no feasible improvements, the intersection would continue to operate at substandard levels and it would be considered a ***significant and unavoidable*** level of service impact.

At locations where implementation of the proposed improvements is not feasible, the proposed project could be required to contribute to the implemention of alternative transportation system improvements that are focused on making the transportation system more efficient and improving the City’s overall multimodal transportation system. Multimodal transporation system improvements could be required in lieu of intersection improvements to offset a project impact, improving the transporation system for all users. Examples of such improvements could include signal timing changes, signal synchronization, adaptive traffic signal systems, bicycle, pedestrian and transit infrastructure improvements, and streetscape projects to enhance the pedestrian environment. However, such improvements may not completely offset the intersection impact. As such, the impact would still be considered significant and unavoidable. Therefore, it is recommended that the SUHSD work with the City of Menlo Park to determine the feasibility of each of the proposed mitigations and their implementation, or determine the implementation of alternative transportation system improvements as possible mitigation measures, as well as determine the project's fair share contribution towards the intersection improvements.

It should be noted that some of the improvements listed below have already been identified as mitigation measures for approved projects in the vicinity of the project site. However, those improvements were not assumed in place for the analysis of the proposed project in an effort to identify the effect of the proposed project on the existing transportation network and provide a more conservative evaluation of potential project impacts.

The resulting level of service conditions with the proposed intersection improvements under 2021 near term plus project conditions are summarized in Table ES1.

1. Bayfront Expressway and Marsh Road

Impact: Caltrans impact (project would increase intersection delay by 4 seconds or more during the AM peak hour under the 2018 project conditions scenario and during both peak hours under the 2021 project conditions scenario).

Mitigation: A potential mitigation measure at this intersection includes the addition of a third eastbound right-turn lane on Marsh Road and restriping the southbound through lane as a shared right-and-through lane. Intersection operations would improve with implementation of the above improvements. However, the intersection would continue to operate at unacceptable levels of service during the peak hours under the 2021 project conditions scenario. Additionally, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

2. Constitution Drive and Independence Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the AM peak hour under both the 2018 and 2021 project conditions scenarios).

Mitigation: A potential mitigation measure at this intersection consists of prohibiting the northbound left-turn movement from Constitution Drive to westbound Independence Drive. The traffic volumes projected to make this movement under near term project conditions are less than 10 vehicles during the peak hours, which would be rerouted to the intersection of Chrysler Drive and Constitution Drive. With the elimination of the northbound left-turn movement at this intersection, the intersection is projected to operate at acceptable LOS A during both peak hours under 2021 near-term plus project conditions.

Although the above improvements would reduce to project impact to less than significant, additional comprehensive analysis of this improvement is required in order to determine its feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvement. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*.**

3. US 101 Northbound Ramps and Marsh Road

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both the AM and PM peak hours under both the 2018 and 2021 project conditions scenarios).

Caltrans impact (project would increase intersection delay by 4 seconds or more during both the AM and PM peak hours under the 2021 project conditions scenario).

Mitigation: A potential mitigation measure at this intersection includes the widening of the northbound off-ramp to include a second northbound right-turn lane. Intersection operations would improve to better than no project conditions with implementation of the second northbound right-turn lane. However, the intersection would continue to operate at unacceptable levels of service during the peak hours under the 2021 project conditions scenario. In order to improve the intersection's level of service to acceptable levels, Marsh Road, and the bridge structure over US 101, would have to be widened from four to six lanes. A project of such magnitude could not feasibly be implemented by a single development project. Additionally, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

4. US 101 Southbound Ramps and Marsh Road

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the AM peak-hour under the 2018 project conditions scenario and during both the AM and PM peak hours under the 2021 project conditions scenario).

Caltrans impact (the project would increase intersection delay by 4 seconds or more during both peak hours under the 2021 project conditions scenario).

Mitigation: A potential mitigation measure at this intersection includes the widening of the southbound off-ramp to add a second southbound right-turn lane and converting the existing southbound right-turn lane into a shared left-and-right turn lane. In addition to widening the southbound off-ramp, this improvement would require the widening of Marsh Road in the eastbound direction to provide a third receiving lane. With implementation of the above improvements, the intersection is projected to operate at acceptable levels of service under project conditions. However, an improvement project of such magnitude could not feasibly be implemented by a single development project. Additionally, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

5. Bayfront Expressway and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour under both the 2018 and 2021 project conditions scenarios).

Caltrans impact (the project would increase intersection delay by 4 seconds or more during the PM peak hour under the 2021 project conditions scenario).

Improvement: The proposed mitigation measure at this intersection consists of the addition of a third eastbound left-turn lane on Chrysler Drive onto northbound Bayfront Expressway. Implementation of the proposed mitigation would improve intersection operations to acceptable levels during both peak hours under the 2021 project conditions scenario. However, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

6. Constitution Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both peak hours under both the 2018 and 2021 project conditions scenarios).

Mitigation: A potential mitigation measure at this intersection consists of the installation of a traffic signal, the addition of a separate left-turn lane on both approaches of Constitution Drive and the westbound approach on Chrysler Drive, and restriping the eastbound approach to include a share left-and-through and a share right-and-through lane. The traffic signal warrant check showed that this intersection is projected to have traffic volumes that satisfy the CA MUTCD peak-hour warrant (Warrant #3) during the PM peak hour under the 2018 project conditions scenario and during both peak hours under the 2021 project conditions scenario (this is discussed in the following chapter). Implementation of the above improvements would improve the intersection operating conditions to better than no project conditions.

Although intersection operating conditions would improve with the above improvements, the intersection would continue to operate at an unacceptable level of service during the PM peak hour under the 2021 project conditions scenario. Additionally, the decision to install a traffic signal should not be based purely on the signal warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Engineering judgment should be exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak hour warrant, therefore, are subject to further analysis before determining that a traffic signal is necessary. Thus, comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvements. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*****.**

7. Jefferson Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under both the 2018 and 2021 project conditions scenarios).

Mitigation: A potential mitigation measure at this intersection consists of the installation of a traffic signal. The traffic signal warrant check showed that this intersection is projected to have traffic volumes that satisfy the CA MUTCD peak-hour warrant (Warrant #3) during the PM peak hour under the 2021 project conditions scenario (this is discussed in the following chapter). Signalizing the intersection would improve the intersection operating conditions to acceptable levels during both peak hours under project conditions.

Although the above improvements would reduce to project impact to less than significant, the decision to install a traffic signal should not be based purely on the signal warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Engineering judgment should be exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak hour warrant, therefore, are subject to further analysis before determining that a traffic signal is necessary. Thus, comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvements. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*****.**

8. Independence Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under the 2021 project conditions scenario).

Mitigation: A potential mitigation measure at this intersection consists of the addition of a separate left-turn lane on the southbound direction on Independence Drive and a separate right-turn lane on the westbound direction on Chrysler Drive. Implementation of the above improvements would improve the intersection operating conditions to acceptable levels during both peak hours under the 2021 project conditions scenario.

Although the above improvements would reduce to project impact to less than significant, additional comprehensive analysis of this improvement is required in order to determine its feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvement. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*****.**

9. Constitution Drive and Jefferson Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under the 2021 project conditions scenario).

Improvement: A potential mitigation measure at this intersection consists of the addition of a separate left-turn lane on the northbound approach on Constitution Drive. Implementation of the above improvements would improve the intersection operating conditions; however, the intersection would continue to operate at unacceptable level of service during the PM peak hour. There are no further feasible improvements available at this intersection. Therefore, the project impact at this intersection is deemed ***significant and unavoidable*****.**

10. Bayfront Expressway and Chilco Street

Impact: City of Menlo Park impact (the proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour under both the 2018 and 2021 project conditions scenarios).

Improvement: A potential mitigation measure at this intersection includes the addition of a second eastbound left-turn lane on Chilco Drive and converting the existing eastbound left-turn lane into a shared left-and-right turn lane. With implementation of the above improvements, the intersection is projected to operate at acceptable levels of service during both peak hours under the 2021 project conditions scenario.

Although intersection operating conditions would improve with the above improvements, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

11. Constitution Drive and Chilco Street

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both peak hours under both the 2018 and 2021 project conditions scenarios).

Improvement: A potential mitigation measure at this intersection consists of the installation of a traffic signal and the addition of a separate left-turn lane on the southbound, eastbound, and westbound approaches and a separate right-turn lane on the northbound approach on Constitution Drive. The traffic signal warrant check showed that this intersection is projected to have traffic volumes that satisfy the CA MUTCD peak-hour warrant (Warrant #3) during the PM peak hour under the 2018 project conditions scenario and during both peak hours under the 2021 project conditions scenario (this is discussed in the following chapter). Implementation of the above intersection would improve the intersection operating conditions to better than no project conditions; however, the intersection would continue to operate at an unacceptable level of service during both peak hours.

Although intersection operating conditions would improve with the above improvements, the decision to install a traffic signal should not be based purely on the signal warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Engineering judgment should be exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak hour warrant, therefore, are subject to further analysis before determining that a traffic signal is necessary. Thus, comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvements. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*****.**

City of Menlo Park Traffic Impact Fee Program

The City of Menlo Park Traffic Impact Fee program was initiated with the purpose of developing a transportation impact fee (TIF) to help fund the transportation improvements that will be needed as development occurs in Menlo Park. This funding source links future development to identified roadway network improvements needed to maintain adequate service levels and is intended to allocate costs of development-related roadway improvements. The traffic impact fees ensure that new development and redevelopment within the City pays a proportional fair share contribution for the cost of new transportation infrastructure that is deemed necessary and reasonably related to accommodating the impact of new development within the City.

New development and redevelopment are subject to the TIFs. The TIFs may only be used for building new arterial streets, sidewalks, bicycle lanes, and other physical improvements to the City's multi-modal transportation network. All fees are paid in full to the City of Menlo Park before a building permit is issued. The TIF amount that development projects are subject to is determined, as stipulated by City ordinance (#964, Municipal Code Section 13.26), based on the project's PM peak hour trip generation. A set fee amount per PM peak hour trip, or per unit for specific land uses described in the *City of Menlo Park Traffic Impact Fee Program* document, dated August 2009 , must be paid by development projects to offset their project's impacts to the Citywide transportation network. The TIFs are adjusted annually, based on the ENR Construction Cost Index percentage for San Francisco.

By paying the TIF, a development project will have contributed their "fair share" to mitigate their project's impacts to the Citywide transportation system. However, if the development is also determined to result in an impact to specific roadway network facilities, in addition to the TIF, the development project may be conditioned to provide local transportation and streetscape improvements to mitigate the identified project impacts.

Near Term Plus Project Roadway Segment Analysis

The results of the roadway segment analysis are summarized in Table ES3. The results of the analysis show that, based on City of Menlo Park potential impact criteria for roadway segments, the proposed project would result in a potentially significant impact at the following roadway segments:

1. Jefferson Drive, south of Chrysler Drive
2. Chrysler Drive, between Jefferson Drive and Constitution Drive
3. Chrysler Drive, between Constitution Drive and Bayfront Expressway
4. Independence Drive, north of Chrysler Drive

Possible Roadway Improvements

Typical roadway network improvements focus in adding capacity to the facility in order to serve the projected increased in traffic volumes. However, the potential impacts to the above roadway segment are based on a designated daily traffic volume limit for the facility, which would not change with the addition of capacity to the roadway. In addition, increasing the capacity of the above roadways would require right-of-way acquisition, which would affect adjacent property owners and is considered unfeasible. Widening of roadways also could lead to other negative effects, such as induced travel demand (more people would be willing to drive rather than taking alternative transportation modes as a result of the increase roadway capacity), reduction in the use of alternative transportation modes, air quality degradation, increase in noise, and reduced safety for pedestrians and bicyclists (due to wider roadways and increased traffic volumes). Therefore, potential impacts on the above roadways are deemed ***significant and unavoidable***.

Although there are no feasible improvements to mitigate the potential roadway segment impacts, other possible improvements and efforts could be implemented to reduce the amount of project traffic added to the roadway segments. The improvements include the following:

- The project could contribute to the completion of planned bicycle facilities in the project area in an effort to encourage more students to bike to school. The City of Menlo Park *Comprehensive Bicycle Development Plan* identifies Class III bike routes along Constitution Drive. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.

  The project could contribute to the completion of planned sidewalk projects in the area that would close existing gaps in the sidewalk network and provide a continuous network connecting the project site to the adjacent neighborhoods. The City of Menlo Park *Sidewalk Master Plan* has identified the entire length of Jefferson Drive, as well as segments of Chrysler Drive, Constitution Drive, and Chilco Street, as priority (high ranking) streets for the installation of missing sidewalks. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.
- The City of Menlo Park, in conjunction with SamTrans, should consider adding bus services to serve the project area directly.
- The project should encourage students to walk, ride their bike, or take public transportation to school in an effort to reduce the amount of traffic generated by the proposed project.

Near Term Plus Project Routes of Regional Significance Analysis

The results of the routes of regional significance analysis are summarized in Table ES4. The results of the analysis show that the segment of Bayfront Expressway, northbound direction from Willow Road to US 101, is projected to operate at unacceptable LOS E during the AM peak hour under near term conditions.The proposed project is projected to add traffic to this segment representing less than four percent (4%) of the segment's capacity. Therefore, based on CMP impact criteria, the proposed project would have an impact at this study route of regional significance.

Possible Route of Regional Significance Improvements

Typical roadway improvements consist in the widening of the roadway to add travel lanes and capacity to serve the projected increased in traffic volumes. However, the study Routes of Regional Significance are under the jurisdiction of Caltrans and the City has no authority over the implementation of improvements. Additionally, an improvement project of such magnitude could not feasibly be implemented by a single development project. Freeway and other state roadway projects are planned and funded on a regional scale. Therefore, potential impacts on the above Route of Regional Significance are deemed ***significant and unavoidable***.

Although there are no feasible improvements to mitigate the potential Routes of Regional Significance impacts, other possible improvements and efforts could be implemented to reduce the amount of project traffic added to these roadway segments. The improvements include the following:

- The project could contribute to the completion of planned bicycle facilities in the project area in an effort to encourage more students to bike to school. The City of Menlo Park *Comprehensive Bicycle Development Plan* identifies Class III bike routes along Constitution

Drive. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.

- The project could contribute to the completion of planned sidewalk projects in the area that would close existing gaps in the sidewalk network and provide a continuous network connecting the project site to the adjacent neighborhoods. The City of Menlo Park *Sidewalk Master Plan* has identified the entire length of Jefferson Drive, as well as segments of Chrysler Drive, Constitution Drive, and Chilco Street, as priority (high ranking) streets for the installation of missing sidewalks. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.
- The City of Menlo Park, in conjunction with SamTrans, should consider adding bus services to directly serve the project area.
- The project should encourage students to walk, ride their bike, or take public transportation to school in an effort to reduce the amount of traffic generated by the proposed project.

Near Term Plus Project Freeway Ramp Analysis

The results of freeway ramp analysis are summarized in Table ES5.

Based on the calculated V/C ratios, the following freeway ramps were projected to operate at substandard levels under near term project conditions, based on Caltrans standards:

Northbound on-ramp from westbound Marsh Road (LOS F – AM & PM peak hours)
Southbound on-ramp from westbound Marsh Road (LOS E - PM peak hour)

Based on Caltrans impact criteria, the proposed project would have an impact at the above freeway ramps. The proposed project would add traffic to the above ramps representing no more than 5% of the ramps' capacity.

Possible Freeway Ramp Improvements

In order to improve the level of service conditions to acceptable levels at the study freeway ramps that are projected to be deficient under near term plus project conditions, the following measures can be implemented:

- Increase capacity on the deficient freeway ramps – This can be accomplished by providing a higher service rate (increase meter rate) at the metered on-ramps. However, this is a State facility and the City has no authority over its operations or improvements.
- Reduce project traffic on the deficient freeway ramps – Project traffic using the impacted freeway on-ramps could use alternative routes. However, it is possible that the displaced project traffic could have a negative impact at other facilities.

Cumulative Conditions Analysis

Intersection levels of service were evaluated against City of Menlo Park and Caltrans Level of Service standards. The intersection levels of service under cumulative conditions are summarized in Table ES2.

City of Menlo Park Intersections

The results of the level of service analysis show that, measured against the City of Menlo Park level of service policy, the proposed 400-student school project would have a negative impact on the following study intersections:

2. Constitution Drive and Independence Drive - (Impact - AM peak hour)
3. US 101 NB Ramps and Marsh Road - (Impact - AM and PM peak hours)

4. US 101 SB Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
6. Constitution Drive and Chrysler Drive - (Impact - AM & PM peak hours)
7. Jefferson Drive and Chrysler Drive - (Impact - PM peak hour)
8. Independence Drive and Chrysler Drive - (Impact - PM peak hour)
9. Constitution Drive and Jefferson Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - PM peak hour)
11. Constitution Drive and Chilco Street - (Impact - AM & PM peak hours)

Caltrans Intersections

The results of the level of service analysis show that, measured against LOS D standard, the proposed 400-student school project would have a negative impact on all five study Caltrans intersections:

1. Bayfront Expressway and Marsh Road - (Impact - AM & PM peak hours)
3. US 101 Northbound Ramps and Marsh Road - (Impact - AM & PM peak hours)
4. US 101 Southbound Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - AM peak hour)

Intersection Mitigation Measures

Below is a brief description of the intersection impacts. Mitigation measures under cumulative conditions are the same as those described under near term project conditions.

The resulting level of service conditions with the proposed intersection improvements under cumulative conditions are summarized in Table ES2.

1. Bayfront Expressway and Marsh Road

Impact: Caltrans impact (project would increase intersection delay by 4 seconds or more during both peak hours).

Mitigation: See description of mitigation measure under near term project conditions.

2. Constitution Drive and Independence Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the AM peak hour).

Mitigation: See description of mitigation measure under near term project conditions.

3. US 101 Northbound Ramps and Marsh Road

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both the AM and PM peak hours).

Caltrans impact (project would increase intersection delay by 4 seconds or more during both the AM and PM peak hours).

Mitigation: See description of mitigation measure under near term project conditions.

4. US 101 Southbound Ramps and Marsh Road

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both the AM and PM peak hours).

Caltrans impact (the project would increase intersection delay by 4 seconds or more during both the AM and PM peak hours).

Mitigation: See description of mitigation measure under near term project conditions.

5. Bayfront Expressway and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour).

Caltrans impact (the project would increase intersection delay by 4 seconds or more during the PM peak hour).

Improvement: See description of mitigation measure under near term project conditions.

6. Constitution Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both peak hours).

Mitigation: See description of mitigation measure under near term project conditions.

7. Jefferson Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour).

Mitigation: See description of mitigation measure under near term project conditions.

8. Independence Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour).

Mitigation: See description of mitigation measure under near term project conditions.

9. Constitution Drive and Jefferson Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour).

Improvement: See description of mitigation measure under near term project conditions.

10. Bayfront Expressway and Chilco Street

Impact: City of Menlo Park impact (the proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour).

Caltrans impact (the project would increase intersection delay by 4 seconds or more during the AM peak hour).

Improvement: See description of mitigation measure under near term project conditions.

11. Constitution Drive and Chilco Street

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both the AM and PM peak hours).

Improvement: See description of mitigation measure under near term project conditions.

Other Transportation Issues

Signal Warrant Analysis Results

The results of the signal warrant analysis show that traffic signals would be warranted at the following intersections under the noted scenarios:

6. Constitution Drive and Chrysler Drive - Near term (2018 and 2021), near term plus project, cumulative, cumulative plus project
7. Jefferson Drive and Chrysler Drive - near term (2021) plus project and cumulative plus project
11. Constitution Drive and Chilco Street - Near term (2018 and 2021), near term plus project, cumulative, cumulative plus project

It should be noted that the need for a traffic signal at the intersection of Constitution Drive and Chrysler Drive (intersection #6) has already been identified as the mitigation measure for the approved Menlo Gateway project.

Additionally, the EIR for the Common Wealth Corporate Center project also identified the need for signalization of the Jefferson Drive and Chrysler Drive (intersection #7) intersection; however, it is the City's discretion whether or not the traffic signal at this location will be installed after additional traffic analysis is complete.

Site Access and On-Site Circulation

Site Access

The project site is proposed to be served by two driveways, both of them along Jefferson Drive. Both driveways would connect to an internal access roadway/drive aisle that would run along the perimeter of the project site, around the proposed school campus.

Due to the location of the parking lot and student drop-off area, it is recommended that circulation within the site be designated as a one-way circulation (clockwise direction), resulting in inbound only access at the southern driveway and outbound only access at the northern driveway. The assignment of project traffic to the site for the site access analysis reflects this access pattern.

Both driveways are shown to be 24 feet wide, which is adequate width to provide two ingress/egress lanes.

Recommendation: It is recommended that circulation within the site be designated as a one-way circulation (clockwise direction).

On-Site Circulation

A single internal access roadway/drive aisle that would run along the site's perimeter is being proposed. Along the northern and western project site boundaries, the drive aisle would be lined with 90-degree parking stalls on the side next to the site's property line. No parking is proposed along the southern project site boundary. Additionally, along the western site boundary, adjacent to the school campus, a 10-foot wide, approximately 220 feet long designated student drop-off area is being proposed. The drive aisle is shown to be 24 feet wide along the northern and southern site boundaries, and 20 feet wide between the parking stalls and the drop-off area on the western site boundary. A 24-foot wide drive aisle can accommodate two lanes of travel.

The proposed layout of the access roadway/drive aisle, parking lot, and drop-off area provide for a convenient and effective vehicular on-site circulation. Some of the benefits of the proposed layout include:

- Two-lane access from the inbound (southern) driveway to the parking area. Providing two inbound lanes, the inner lane (lane next to the school campus) could serve as the drop-off lane, serving the drop-off area directly, while the second/outer lane would function as a bypass lane to serve all other non-drop-off traffic. Alternatively, both lanes could be utilized to serve the drop-off area and maximize the queue storage capacity within the site. This would provide twice the vehicle store capacity on-site to accommodate the expected drop-off queue, however, non-drop-off traffic would be forced to wait in the drop-off queue.
- Reduced conflict between vehicles parking and drop-off traffic by designating the inner inbound lane as the drop-off lane and the outer lane as the bypass lane. A bypass lane would allow vehicles wanting to park or exit the site to bypass the drop-off queue.
- Circulation within the site is simple and one-directional, with no dead ends or conflicting movements present.

Based on the proposed project site layout and aforementioned benefits, on-site circulation would be adequate.

Pedestrian Access and Circulation

Some of the students may walk or ride their bike to school. However, partial sidewalks (either sidewalks are partially or complete missing along at least one side of the road) are found along Jefferson Drive, Independence Drive, Constitution Drive, Chrysler Drive, and Chilco Street. Sidewalks are found along most of the west side of Jefferson Drive, including along the project frontage, and only along a few segments on the east side of the street.

The missing sidewalks along streets in the immediate vicinity of the project site create a disconnection between the project site area and nearby neighborhoods. Additionally, no bicycle facilities are currently provided in the immediate vicinity of the project site, requiring bicyclist in the project area to share the roadway with vehicular traffic. The lack of continuous pedestrian and bicycle facilities connecting the project site to the adjacent neighborhoods potentially could discourage students from walking and/or riding their bike to school, or could force them to walk along property frontages without sidewalks, undeveloped roadway shoulders, and/or within the street.

Within the project site, the proposed drop-off area is located adjacent to the school campus, reducing the need for students to cross the drive aisle within the parking area.

Recommendation: It is recommended that the SUHSD works with the City of Menlo Park to develop a safe route to schools program that will define the safest routes for pedestrians between the adjacent residential areas and the project site.

Recommendation: The SUHSD could work with the City of Menlo Park to ensure pedestrian facilities in proximity to the project site are provided to the maximum extent possible. In particular, sidewalks along both sides of the entire extend of Jefferson Drive and along Chilco Street, which connects the project area with the Belle Haven neighborhood, are recommended.

Access Driveways Operations

Operations at the project driveways during drop-off times were evaluated.

Based on the CA MUTCD peak-hour traffic signal warrant (warrant #3), the projected peak-hour traffic volumes at the project driveways would fall below the thresholds that warrant signalization.

Additionally, level of service calculations at the project driveways project both driveways to operate at LOS A during both the AM and PM peak hours. The maximum queue length at the outbound driveway is projected to be approximately 4 vehicles during the AM peak hour while the maximum queue at the inbound driveway is projected to be about 2 to 3 vehicles in the northbound direction on Jefferson Drive during the AM peak hour.

Based on the results of the analysis, operations at the project driveways are projected to be adequate.

Sight Distance

Adequate sight distance should be provided at the project outbound driveway. The outbound driveway is located along a straight roadway segment with minimal visual obstruction. The sight distance from this driveway to the north was measured to extend to Chrysler Drive (approximately 300 feet) while the sight distance to the south extends almost to the point where Jefferson Drive curves eastward (approximately 1,000 feet). By law, school zones have a 25 mile per hour (mph) speed limit. According to the Caltrans *Highway Design Manual*, the minimum required stopping sight distance for a roadway with a posted speed limit of 25 mph is 150 ft. Therefore, based on field observations and Caltrans requirements, the available sight distance at the outbound driveway on Jefferson Drive is adequate.

Recommendation: The design of the school campus should ensure design features, in particular the landscaping and signage along the school frontage, will not interfere with the sight distance at the proposed site driveways.

Emergency Vehicle and Truck Access

The 24-foot ingress and egress driveways should provide adequate access for emergency vehicles and trucks. The 20- to 24-foot drive aisle, along with adequate turn radii, would allow emergency vehicles to be able to circulate around the parking lot and have access to all parts of the school site.

The trash enclosure is shown on the site plan to be located at the southwest corner of the project site, making this location easily accessible by larger garbage trucks.

With the proposed parking lot layout, and adhering to City design standards and guidelines, emergency vehicle access and circulation within the project site should be adequate.

Parking

According to the project site plan, the project would provide a total of 50 parking spaces on site, two of which are labeled as accessible spaces. The proposed school would include 35 staff/faculty members and serve up to 400 students.

The project site is located within an area classified as M2 (General Industrial) District in the City of Menlo Park General Plan. Although the City has adopted off-street parking requirements for M2 Districts, it does not have parking requirements specific to schools. For this reason, estimated parking demand for the proposed school was estimated based on ITE parking generation rates and existing parking information at two other SUHSD high schools.

Based on the ITE rate, the proposed project would need to provide approximately 71 parking spaces (36 for students and 35 for staff/faculty members) to serve the average peak period, assuming a total of 400 high school students and 35 staff/faculty members. Based on this estimate, the proposed number of on-site parking spaces would not be sufficient to serve the estimated parking demand.

Based on the existing parking demand at East Palo Alto High School (parking generation rate of 0.17 spaces per student), it is estimated that at full capacity (400 students and 35 staff/faculty), the proposed school project would need to provide approximately 74 parking spaces to serve its projected demand.

Based on this estimate, the proposed number of on-site parking spaces would not be sufficient to serve the estimated parking demand.

Americans with Disabilities Act Requirements

The project proposes to provide two accessible parking spaces, satisfying ADA requirements. The proposed accessible spaces are located across from a school entrance, along what seems to be the shortest accessible route.

Recommendation: It is recommended that the school work with the City and parents to develop parking alternatives and/or plans to reduce the number of students driving to the site. For example, the school could implement a permit parking program and limit the number of student parking permits issued, establish a carpool program, and/or provide incentive programs for students using alternative modes of transportation such as transit, biking, or walking to school.

Drop-Off and Pick-Up Activities

Proposed Drop-off Circulation

With the proposed driveways and parking layout, vehicles would turn into the project site via the inbound driveway, travel westbound along the access roadway, and turn right towards the designated drop-off/pick-up area. Once the student is dropped-off, vehicles from the drop-off area would circulate around the parking lot towards the exit (outbound driveway).

Assuming one of the inbound lanes would be the designated drop-off lane, plus the drop-off area, a total of approximately 480 feet of queue storage capacity would be provided within the project site. Assuming an average of 25 feet of queue storage is needed per vehicle, the proposed queue storage space could accommodate up to 19 vehicles on site, 8-9 of which would be within the drop-off area.

The expected queue length within the drop-off lane was estimated using Poisson's probability distribution and based on the estimated inbound trip generation during the AM peak hour, which is the highest for the school. Estimating the queue length for the drop-off area based on the total number of vehicles entering the site in the morning is an extremely conservative analysis since some of those trips would be made by students/staff parking on site, and therefore, would not be included on the drop-off queue.

Using Poisson's probability and assuming a steady stream of inbound traffic, it is estimated that a maximum of 2 vehicles would be queued up beyond the drop-off area at a given time during the peak 30-minute period. Assuming that the student drop-offs would occur within the 15 minutes prior to the beginning of the school day, the maximum queue length extending beyond the drop-off area would be approximately 4 vehicles. Therefore, the proposed vehicle queue storage capacity within the site is estimated to be adequate to serve the projected vehicular queue length.

Pedestrian Facilities

Based on student mode of access information provided by school staff, it was calculated that approximately 25% and 35% of the existing students at Everest and East Palo Alto High Schools, respectively, walk, ride their bike, or take public transportation to school. Both of these schools are located within residential neighborhoods that make it more accessible for students to use other modes of access besides the passenger vehicle. Since the proposed school site is located within an industrial area, the percentage of students walking/biking/taking transit may be lower.

As partial mitigation to their projected traffic impacts, the Commonwealth Corporate Center project plans to install sidewalks along the frontage at 138 and 160 Jefferson Drive and along both the Jefferson Drive and Chrysler Drive frontage at 1150 Chrysler Drive. Additionally, the Commonwealth project plans to install ADA-compliant pedestrian curb ramps across the Jefferson Drive leg of the Jefferson Drive/

Chrysler Drive intersection and across the east leg of Chrysler Drive at the Independence Drive/Chrysler Drive intersection.

The above planned improvements will help close gaps in the existing sidewalk network in the immediate vicinity of the project site.

City of Menlo Park General Plan

The City of Menlo Park *General Plan* identifies various policies to promote walking as an alternative mode of access for short trips. Some policies to achieve this goal include:

- The City shall require all new development to incorporate safe and attractive pedestrian facilities on-site.
- The City shall incorporate appropriate pedestrian facilities, traffic control, and street lighting within street improvement projects to maintain or improve pedestrian safety.
- The City shall prepare a safe school route program to enhance the safety of school children who walk to school.

City of Menlo Park Sidewalk Master Plan

The *2009 City of Menlo Park Sidewalk Master Plan* was developed to serve as a guideline for the allocation of capital, maintenance, administration, and matching funds for sidewalk facilities. The primary purpose of the plan is to prioritize sidewalk installation by providing an inventory of existing gaps in the City's sidewalk network. Priority streets are identified as those roadways that provide network connectivity and access to important pedestrian destinations, such as schools, parks, and the downtown area. Roadway segments with missing sideways throughout the City were ranked into three categories: high, medium, and low ranking. The entire length of Jefferson Drive, as well as segments of Chrysler Drive, Constitution Drive, and Chilco Street have been identified in the Sidewalk Master Plan as high ranking segments.

City of Menlo Park Complete Streets Policy

The *2013 Complete Streets Policy* of the City of Menlo Park expresses the City's desire and commitment to create and maintain streets that provided safe, comfortable, and convenient travel for all users and abilities through a comprehensive, integrated transportation network. The policy calls for City agencies to work towards making Complete Streets practice a routine of everyday operations, project approach, and programs. Complete streets infrastructure should be considered in all planning, funding, design, approval, and implementation of any significant construction, reconstruction, or alteration of streets within the City. Possible improvements include sidewalks, bicycle facilities, paved shoulders, landscaping, accessible curb ramps, crosswalks, pedestrian signal heads, and public transit stops, among others.

Bicycle Facilities

No bicycle facilities are currently provided in the immediate vicinity of the project site. The closest bicycle facilities to the project site include Class II bikeways along Chilco Street, between Bayfront Expressway and just south of the railroad tracks (north of Hamilton Avenue), and the San Francisco Bay Trail along Bayfront Expressway.

Based on student mode of access information provided by school staff, it was calculated that approximately 5% and 3% of the existing students at Everest and East Palo Alto High Schools, respectively, ride their bike to school. Conservatively assuming that up to 5% of the proposed school students would ride their bike to school, this represents approximately 20 students riding their bike to the site. Since no bicycle facilities are currently provided in the immediate vicinity of the project site, the estimated 20 students riding their bike to school would share the roadway with vehicular traffic.

The City of Menlo Park General Plan identifies bicycle parking requirements for different land uses. However, no requirements are specified for schools. Nevertheless, and anticipating that some of the students would ride their bike to school, the school is proposing to provide bicycle racks on site. Based on the above estimate, the school should try to provide a minimum of 20 bicycle parking spaces on-site.

City of Menlo Park General Plan

The City of Menlo Park *General Plan* identifies various policies to promote the safe use of bicycle travel as a commute alternative and for recreation. Some policies to achieve this goal include:

- The City shall, within available funding, work to complete a system of bikeways within Menlo Park.
- The City shall encourage transit providers within San Mateo County to provide improved bicycle access to transit including secure storage at transit stations and on-board storage where feasible.

City of Menlo Park Comprehensive Bicycle Development Plan

The *2005 Menlo Park Comprehensive Bicycle Development Plan* provides a blueprint for a citywide system of bike lanes, bike routes, bike paths, bicycle parking, and other related facilities to allow for safe, efficient and convenient bicycle travel within the City. The purpose of the plan is to enhance and expand the existing bicycle network by connecting gaps, addressing constrained areas, and providing for great local (to community centers, schools, parks, libraries, employment centers, and commercial centers) and regional connectivity.

The plan makes recommendations on bicycle network projects and improvements, prioritizing them into three categories: Short-term, Mid-term, and Long-term projects.

The Comprehensive Bicycle Development Plan identifies Class III bike routes along Constitution Drive as a mid-term project and Class II bike lanes along Marsh Road, between Bayfront Expressway and Bay Road, as a long-term project.

Transit Services

The study area is served directly by the *Marsh Road Shuttle* route, which provides free shuttle service between the Menlo Park Caltrain Station and the project area on weekdays. This service is available to the general public and runs along Middlefield Road, Marsh Road, Constitution Drive, Jefferson Drive, Chilco Street, and Bayfront Expressway with scheduled stops directly at the project site (at 150 Jefferson Drive). Four trips are made from the Menlo Park Caltrain Station to the project area between 6:58 and 9:25 AM, with the last trip arriving at the project site around 9:42 AM. Five trips are made in the afternoon/evening, with the stops at the project site scheduled for 2:27, 3:31, 4:09, 4:44, and 5:51 PM.

The existing Marsh Road Shuttle service would provide an alternative mode of access to the proposed school both locally (from the adjacent neighborhood areas) and regionally (via its connection to the Menlo Park Caltrain Station).

City of Menlo Park General Plan

The City of Menlo Park *General Plan* identifies various policies to promote the use of public transit. Some policies to achieve this goal include:

- The City shall consider transit modes in the design of transportation improvements and the review and approval of development projects.
- The City shall promote improved public transit service and increased transit ridership, especially to office and industrial areas and schools.

Table ES 1
Intersection Level of Service Summary – Near Term Plus Project Conditions

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Near Term 2021 (No Project) Delay [1]	LOS [2]	Near Term 2021 With Project (400 students) Delay [1]	LOS [2]	Change in Delay [3]	Near Term 2021 With Project (400 students) With Mitigations Delay [1]	LOS [2]	Change in Delay [3]
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches) /CMP	D	AM	**827.3** [4]	**F**	**899.5** [4]	**F**	**72.2**	**621.9** [4]	**F**	**-205.4**
	SB Critical Delay					***273.8*** [4]	***F***	***273.8*** [4]	***F***	***0.0***	***74.2***	***E***	***-199.6***
	WB Critical Delay					*54.0*	*D*	*54.0*	*D*	*0.0*	*54.0*	*D*	*0.0*
					PM	**748.5** [4]	**F**	**770.3** [4]	**F**	**21.8**	**505.4** [4]	**F**	**-243.1**
	SB Critical Delay					***61.8***	***E***	***61.8***	***E***	***0.0***	***61.8***	***E***	***0.0***
	WB Critical Delay					***65.1***	***E***	***65.1***	***E***	***0.0***	***65.1***	***E***	***0.0***
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	C	AM	**3057.3** [4]	**F**	**10000.0** [4]	**F**	**6942.8**	6.1	A	-3051.2
					PM	15.4	C	16.2	C	0.8	4.0	A	-11.4
3	US-101 NB Ramps and Marsh Road	Signal	State	D	AM	**139.2** [4]	**F**	**158.6** [4]	**F**	**19.4**	**95.7**	**F**	**-43.5**
					PM	**104.6** [4]	**F**	**111.9** [4]	**F**	**7.3**	**95.4**	**F**	**-9.2**
4	US-101 SB Ramps and Marsh Road	Signal	State	D	AM	**95.2**	**F**	**104.1**	**F**	**8.9**	**No Feasible Mitigation**		
					PM	**140.2** [4]	**F**	**146.4** [4]	**F**	**6.2**			
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local approaches)	D	AM	30.3	C	38.3	D	8.0	30.1	C	-0.2
					PM	**95.7**	**F**	**108.8** [4]	**F**	**13.1**	40.7	D	-55.0
	EB Critical Delay					***316.0*** [4]	***F***	***356.2*** [4]	***F***	***40.2***	***61.5***	***E***	***-254.5***
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	C	AM	**40.5**	**E**	**120.9**	**F**	**80.4**	26.9	C	-13.6
					PM	**478.5** [4]	**F**	**540.0** [4]	**F**	**61.5**	**117.6** [4]	**F**	**-360.9**
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	12.1	B	13.8	B	1.6	27.3	C	15.2
					PM	**32.7**	**D**	**65.3**	**F**	**32.6**	24.2	C	-8.5
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	14.6	B	16.1	C	1.5	11.5	B	-3.1
					PM	**29.7**	**D**	**32.1**	**D**	**2.4**	21.9	C	-7.8
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	C	AM	20.1	C	22.9	C	2.9	22.4	C	2.3
					PM	**53.5**	**F**	**63.0**	**F**	**9.5**	**62.7**	**F**	**9.2**
10	Bayfront Expressway and Chilco Street	Signal	State (with local approaches)	D	AM	**64.9**	**E**	**67.6**	**E**	**2.7**	22.6	C	-42.3
	EB Critical Delay					***82.3***	***F***	***82.3***	***F***	***0.0***	***72.5***	***E***	***-9.8***
					PM	**109.6** [4]	**F**	**111.5** [4]	**F**	**1.9**	34.3	C	-75.3
	EB Critical Delay					***590.7*** [4]	***F***	***602.5*** [4]	***F***	***11.8***	***69.5***	***E***	***-521.2***
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	C	AM	**144.5** [4]	**F**	**156.6** [4]	**F**	**12.1**	**46.0**	**D**	**-98.5**
					PM	**299.7** [4]	**F**	**309.6** [4]	**F**	**9.9**	**64.4**	**E**	**-235.3**

Notes:
[1] Delay = average seconds of delay per vehicle for all vehicles at signalized and 4-way stop-controlled intersections, and average worst approach delay for vehicles at 2-way/1-way stop-controlled intersections.
[2] LOS = level of service for the entire intersection at signalized and 4-way stop-controlled intersections, and for the worst approach at 2-way/1-way stop-controlled intersections.
[3] Level of service impact thresholds include a change in the average intersection delay of 23 seconds or more at intersections operating at acceptable levels and a change in all critical movements of 0.8 seconds or more at City of Menlo Park intersections or a change of 0.8 seconds or more on the local approaches' most critical movement at State-controlled intersections operating at substandard levels.
Level of service impact threshold for State intersections operating at unacceptable levels of service (LOS E or F) is the increase of 4 or more seconds to the average intersection delay.
[4] The HCM methodology for intersection analysis does not accurately calculate actual intersection operating conditions once the calculated intersection delay exceeds 100+ seconds. Once an intersection is calculated to operate with delays exceeding 100 seconds, any additional traffic to the intersection will increase the intersection delay exponentially, resulting in unrealistic excessive delays that most likely would never be experienced at an actual intersection. However, for the purpose of quantifying the projected increase in delay due to the proposed project, all calculated delays are reported, including those exceeding 100 seconds.
Entries denoted in **bold** indicate conditions that exceed the City's (and/or Caltrans for the applicable intersections) current level of service standard.
- Denotes significant impact based on City of Menlo Park criteria.
- Denotes significant impact based on Caltrans criteria.

Table ES 2
Intersection Level of Service Summary – Cumulative Conditions

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Cumulative (No Project)		Cumulative with Project (400 students)			Cumulative With Project With Mitigations		
						Delay [1]	LOS [2]	Delay [1]	LOS [2]	Change in Delay [3]	Delay [1]	LOS [2]	Change in Delay [3]
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches)/ CMP	D	AM	1009.1 [4]	F	1083.2 [4]	F	74.1	744.3 [4]	F	54.1
	SB Critical Delay					*282.8* [4]	*F*	*282.8* [4]	*F*	*0.0*	*75.2*	*E*	*0.0*
	WB Critical Delay					*54.0*	*D*	*54.0*	*D*	*0.0*	*54.0*	*D*	*0.0*
					PM	797.6 [4]	F	819.8 [4]	F	22.2	548.3 [4]	F	18.3
	SB Critical Delay					*62.8*	*E*	*62.8*	*E*	*0.0*	*62.8*	*E*	*0.0*
	WB Critical Delay					*65.2*	*E*	*65.2*	*E*	*0.0*	*65.2*	*E*	*0.0*
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	C	AM	4266.2 [4]	F	10000.0 [4]	F	5733.8	6.1	A	0.1
					PM	15.6	C	16.4	C	0.8	4.0	A	0.0
3	US-101 NB Ramps and Marsh Road	Signal	State	D	AM	167.1 [4]	F	187.8 [4]	F	20.7	126.8 [4]	F	18.1
					PM	115.2 [4]	F	122.5 [4]	F	7.3	105.8 [4]	F	5.5
4	US-101 SB Ramps and Marsh Road	Signal	State	D	AM	108.4 [4]	F	118.4 [4]	F	10.0	No Feasible Mitigation		
					PM	163.2 [4]	F	169.8 [4]	F	6.6			
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local approaches)	D	AM	30.3	C	38.2	D	7.9	30.0	C	1.2
					PM	95.2	F	107.6 [4]	F	12.4	45.6	D	2.3
	EB Critical Delay					*322.1* [4]	*F*	*361.9* [4]	*F*	*39.7*	*63.1*	*E*	*9.3*
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	C	AM	44.9	E	125.8	F	80.9	27.2	C	1.7
					PM	492.1 [4]	F	554.6 [4]	F	62.5	122.0 [4]	F	4.5
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	12.4	B	14.1	B	1.7	28.2	C	20.7
					PM	34.2	D	69.5	F	35.4	24.8	C	5.5
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	14.7	B	16.3	C	1.6	11.6	B	0.5
					PM	30.8	D	33.6	D	2.8	22.6	C	1.3
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	C	AM	20.2	C	23.0	C	2.9	22.5	C	2.7
					PM	58.0	F	69.8	F	11.8	69.5	F	11.7
10	Bayfront Expressway and Chilco Street	Signal	State (with local approaches)	D	AM	182.6 [4]	F	186.9 [4]	F	4.3	54.8	D	4.4
	EB Critical Delay					*106.0* [4]	*F*	*106.0* [4]	*F*	*0.0*	*150.4* [4]	*F*	*1.0*
					PM	276.1 [4]	F	278.5 [4]	F	2.4	105.7 [4]	F	1.8
	EB Critical Delay					*1234.5* [4]	*F*	*1244.6* [4]	*F*	*10.2*	*301.9* [4]	*F*	*2.8*
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	C	AM	514.8 [4]	F	537.5 [4]	F	22.7	226.2 [4]	F	46.7
					PM	785.4 [4]	F	789.6 [4]	F	4.2	149.8 [4]	F	9.7

Notes:

[1] Delay = average seconds of delay per vehicle for all vehicles at signalized and 4-way stop-controlled intersections, and average worst approach delay for vehicles at 2-way/1-way stop-controlled intersections.

[2] LOS = level of service for the entire intersection at signalized and 4-way stop-controlled intersections, and for the worst approach at 2-way/1-way stop-controlled intersections.

[3] Level of service impact thresholds include a change in the average intersection delay of 23 seconds or more at intersections operating at acceptable levels and a change in all critical movements of more 0.8 seconds or at City of Menlo Park intersections or a change of 0.8 seconds or more on the local approaches' most critical movement at State-controlled intersections operating at substandard levels. Level of service impact threshold for State intersections operating at unacceptable levels of service (LOS E or F) is the increase of 4 or more seconds to the average intersection delay.

[4] The HCM methodology for intersection analysis does not accurately calculate actual intersection operating conditions once the calculated intersection delay exceeds 100+ seconds. Once an intersection is calculated to operate with delays exceeding 100 seconds, any additional traffic to the intersection will increase the intersection delay exponentially, resulting in unrealistic excessive delays that most likely would never be experienced at an actual intersection. However, for the purpose of quantifying the projected increase in delay due to the proposed project, all calculated delays are reported, including those exceeding 100 seconds.

Entries denoted in **bold** indicate conditions that exceed the City's (and/or Caltrans for the applicable intersections) current level of service standard.

- Denotes significant impact based on City of Menlo Park criteria.

- Denotes significant impact based on Caltrans criteria.

Table ES 3
Roadway Segment Analysis Results Summary

	Roadway Segment	Classification	Capacity	Project Trips	Near Term ADT	Near Term Plus Project: Near Term Plus Project	Near Term Plus Project: % Change from Near-Term	Potentially Significant Impact[1]	Cumulative ADT	Cumulative Plus Project: Cumulative Plus Project	Cumulative Plus Project: % Change from Cumulative	Potentially Significant Impact[1]
1	Jefferson Drive, south of Chrysler Drive	Local	1,500	**388**	**2,330**	**2,718**	**16.7%**	**Yes**	**2,540**	**2,928**	**15.3%**	**Yes**
2	Chrysler Drive, between Jefferson Drive and Constitution Drive	Local	1,500	**350**	**8,370**	**8,720**	**4.2%**	**Yes**	**8,800**	**9,150**	**4.0%**	**Yes**
3	Chrysler Drive, between Constitution Drive and Bayfront Expressway	Collector	10,000	**311**	**13,670**	**13,981**	**2.3%**	**Yes**	**14,840**	**15,151**	**2.1%**	**Yes**
4	Independence Drive, north of Chrysler Drive	Local	1,500	**39**	**5,740**	**5,779**	**0.7%**	**Yes**	**5,900**	**5,939**	**0.7%**	**Yes**
5	Constitution Drive, between Jefferson Drive and Chilco Street	Collector	10,000	60	5,410	5,470	1.1%	No	5,750	5,810	1.0%	No
6	Chilco Street, between Constitution Drive and Bayfront Expressway	Collector	10,000	28	8,990	9,018	0.3%	No	**10,140**	**10,168**	0.3%	No

Notes:
ADT = Average Daily Traffic
Roadway segment classification, capacity, and existing ADT information obtained from the *Circulation Existing Conditions* Report (City of Menlo Park General Plan), January 2015, with the exception of segments #1 and #4.
[1] The City of Menlo Park identifies the following roadway segment capacity thresholds as potential impact criteria:
Local Street - Potential impact if ADT is >1,350 vehicles and project adds >25 trips, or ADT is >750 and project increases ADT by 12.5%, or ADT is <750 and project increases ADT by 25%.
Collector Street - Potential impact if ADT is >9,000 vehicles and project adds >50 trips, or ADT is >5,000 and project increases ADT by 12.5%, or ADT is <5,000 and project increases ADT by 25%.
Bold indicates ADT values that exceed the acceptable capacity.

Table ES 4
Routes of Regional Significance Analysis Results Summary

						Near Term		Near-Term Plus Project					Cumulative		Cumulative Plus Project				
Route	Segment	Direction	LOS Standard[1]	Capacity[2]	Peak Hour	Total Volume	V/C	Net Project Trips	Total Volume	V/C	LOS	Project % of Capacity	Total Volume	V/C	Net Project Trips	Total Volume	V/C	LOS	Project % of Capacity
US 101	North of Marsh Road	NB	F	9,200	AM	7,042	0.765	44	7,086	0.770	D	0.5%	7,067	0.768	44	7,111	0.773	D	0.5%
				9,200	PM	6,964	0.757	29	6,993	0.760	D	0.3%	7,107	0.773	29	7,136	0.776	D	0.3%
	North of Marsh Road	SB	F	9,200	AM	8,758	0.952	53	8,811	0.958	E	0.6%	8,883	0.966	53	8,936	0.971	E	0.6%
				9,200	PM	8,062	0.876	24	8,086	0.879	E	0.3%	8,090	0.879	24	8,114	0.882	E	0.3%
US 101	South of Marsh Road	NB	F	9,200	AM	6,996	0.760	35	7,031	0.764	D	0.4%	6,999	0.761	35	7,034	0.765	D	0.4%
				9,200	PM	6,336	0.689	16	6,352	0.690	D	0.2%	6,350	0.690	16	6,366	0.692	D	0.2%
	South of Marsh Road	SB	F	9,200	AM	7,868	0.855	29	7,897	0.858	E	0.3%	7,884	0.857	29	7,913	0.860	E	0.3%
				9,200	PM	7,849	0.853	19	7,868	0.855	E	0.2%	7,853	0.854	19	7,872	0.856	E	0.2%
Bayfront Expressway (SR 84)	from Willow Road (SR 114) to US 101	NB	D	3,300	AM	**3,012**	**0.913**	**125**	**3,137**	**0.951**	**E**	**3.8%**	**3,037**	**0.920**	**125**	**3,162**	**0.958**	**E**	**3.8%**
				3,300	PM	2,689	0.815	82	2,771	0.840	D	2.5%	2,876	0.872	82	2,958	0.896	D	2.5%
	from US 101 to Willow Road (SR 114)	SB	D	3,300	AM	2,158	0.654	91	2,249	0.682	B	2.8%	2,358	0.715	91	2,449	0.742	C	2.8%
				3,300	PM	2,635	0.798	41	2,676	0.811	D	1.2%	2,667	0.808	41	2,708	0.821	D	1.2%

Notes:
V/C = Volume to Capacity Ratio; LOS = Level of Service.
[1] Level of service standards as defined in the C/CAG *LOS and Performance Measure Monitoring Report*, 2015.
[2] The *Highway Capacity Manual* identifies capacity values for freeway segments with six or more lanes as 2,300 vehicles per hour per lane (vphpl); the capacity for four-lane freeway segments is identified as 2,200 vphpl.
Arterial capacity is estimated to be 1,100 vphpl, based on a saturation flow rate of 1,900 vphpl and assuming the arterial facility receives 60 percent of the green time.
Bold indicates segment operating at substandard levels of service.
☐ - Denotes potential significant project impact.

Table ES 5
Freeway Ramp Analysis Results Summary

					Near-Term Conditions					Near-Term Plus Project Conditions						
Interchange/Ramp	Ramp Type	Existing Control Type	Peak Hour	Ramp Capacity (vph)[1]	Total Volume	Mixed-flow Volume (vph)[2]	HOV Volume (vph)[3]	V/C [4]	LOS [4]	Total Volume	Project Trips	Mixed-flow Volume (vph)[2]	HOV Volume (vph)[3]	V/C [4]	LOS [4]	Project's % of Capacity
US 101 at Marsh Road																
NB off-ramp to Marsh Rd	Diagonal	Signal	AM	2,000	1,553	1,553	N/A	0.777	C	1,588	35	1,588	N/A	0.794	C	1.8%
		Signal	PM	2,000	1,106	1,106	N/A	0.553	A	1,120	14	1,120	N/A	0.560	A	0.7%
NB on-ramp from WB Marsh Rd	Diagonal	Meter	AM	900	**2,238**	**1,679**	**560**	**1.865**	**F**	**2,282**	**44**	**1,712**	**571**	**1.902**	**F**	4.9%
		Meter	PM	900	**1,281**	**897**	**384**	**0.996**	**E**	**1,310**	**29**	**917**	**393**	**1.019**	**F**	3.2%
SB off-ramp to Marsh Rd	Diagonal	Signal	AM	4,000	2,116	2,116	N/A	0.529	A	2,169	53	2,169	N/A	0.542	A	1.3%
		Signal	PM	4,000	1,841	1,841	N/A	0.460	A	1,865	24	1,865	N/A	0.466	A	0.6%
SB on-ramp from WB Marsh Rd	Loop	Meter	AM	900	305	305	N/A	0.339	A	334	29	334	N/A	0.371	A	3.2%
		Meter	PM	900	**791**	**791**	**N/A**	**0.879**	**D**	**810**	**19**	**810**	**N/A**	**0.900**	**E**	2.1%

Notes:

[1] Typical capacity for diagonal ramps is 2,000 vehicles per hour per lane (vphpl).
The capacity for non-metered ramps is determined based on the number of lanes at the ramp's constraint point.
The capacity for metered on-ramps was assumed to be 900 vphpl for mixed-flow lane ramps, regardless of the number of lanes.
At ramps that include HOV lanes, the analysis is based on the mixed-flow lane(s) ONLY.

[2] Existing ramp count data provided by Caltrans and consists of 2015 counts.

[3] HOV traffic volumes at the northbound on-ramp from westbound Marsh Road was assumed to be 25% and 30% of total traffic volume during the AM and PM peak hour, respectively, based on the percentage of HOV traffic on the freeway mainline.

[4] The calculated volume-to-capacity (V/C) ratio at the northbound on-ramp from westbound Marsh Road corresponds to the mixed-flow traffic volumes and capacity ONLY (the HOV lane is projected to operate adequately). The ramp level of service corresponds to the calculated ramp V/C ratios.

Bold indicates substandard level of service conditions, based on Caltrans level of service standard of LOS C or better.

☐ - Denotes potential project impact.

1. Introduction

This report presents the results of the transportation impact analysis (TIA) conducted for the proposed Menlo Park Small High School in the City of Menlo Park, California. The proposed new high school would be part of the Sequoia Union High School District (SUHSD). The project site is located at 150 Jefferson Drive and consists of an approximately 2.1-acre site. The project site is within the general area surrounded by Bayfront Expressway (SR 84) to the northeast, Dumbarton rail corridor to the south, US 101 to the southwest, and Marsh Road to the north. Currently, an approximately 44,000 square-foot building occupies the site and serves as the corporate headquarters and sales office for Bay Associates Wireless Technologies, a cable and cable assemblies business. The existing facilities on site are proposed to be demolished and replaced with a new school campus. The new school, as proposed, would serve up to 400 students in the grades 9 to 12 with 35 faculty/staff members. The school would be in session from 8:15-8:30 AM to 3:30-3:45 PM during the traditional school year, with summer school offerings as well.

The proposed school is intended to alleviate increases in the SUHSD's existing and projected student enrollment, and therefore, would be open to all SUHSD students. However, the SUHSD anticipates the school would primarily serve students from the southern part of the SUHSD (Redwood City, Menlo Park, and East Palo Alto).

The project site location and the surrounding study area are shown on Figure 1. The project site plan is shown on Figure 2.

Scope of Study

This study was conducted for the purpose of identifying the potential traffic impacts related to the proposed school project. The potential impacts related to the proposed school were evaluated following the standards and methodologies set forth by the City of Menlo Park, the City/County Association of Governments (C/CAG) of San Mateo County, and Caltrans. C/CAG administers the County Congestion Management Program (CMP) while Caltrans has jurisdiction over some of the study facilities.

The study includes an analysis of five signalized intersections, six unsignalized intersections, six local roadway segments, three CMP roadway segments, and one freeway interchange, all of them located within the City of Menlo Park. The study also includes a site access and on-site circulation analysis, and an evaluation of the proposed parking and drop-off and pick-up activities on-site.

Figure 1
Site Location and Study Intersections

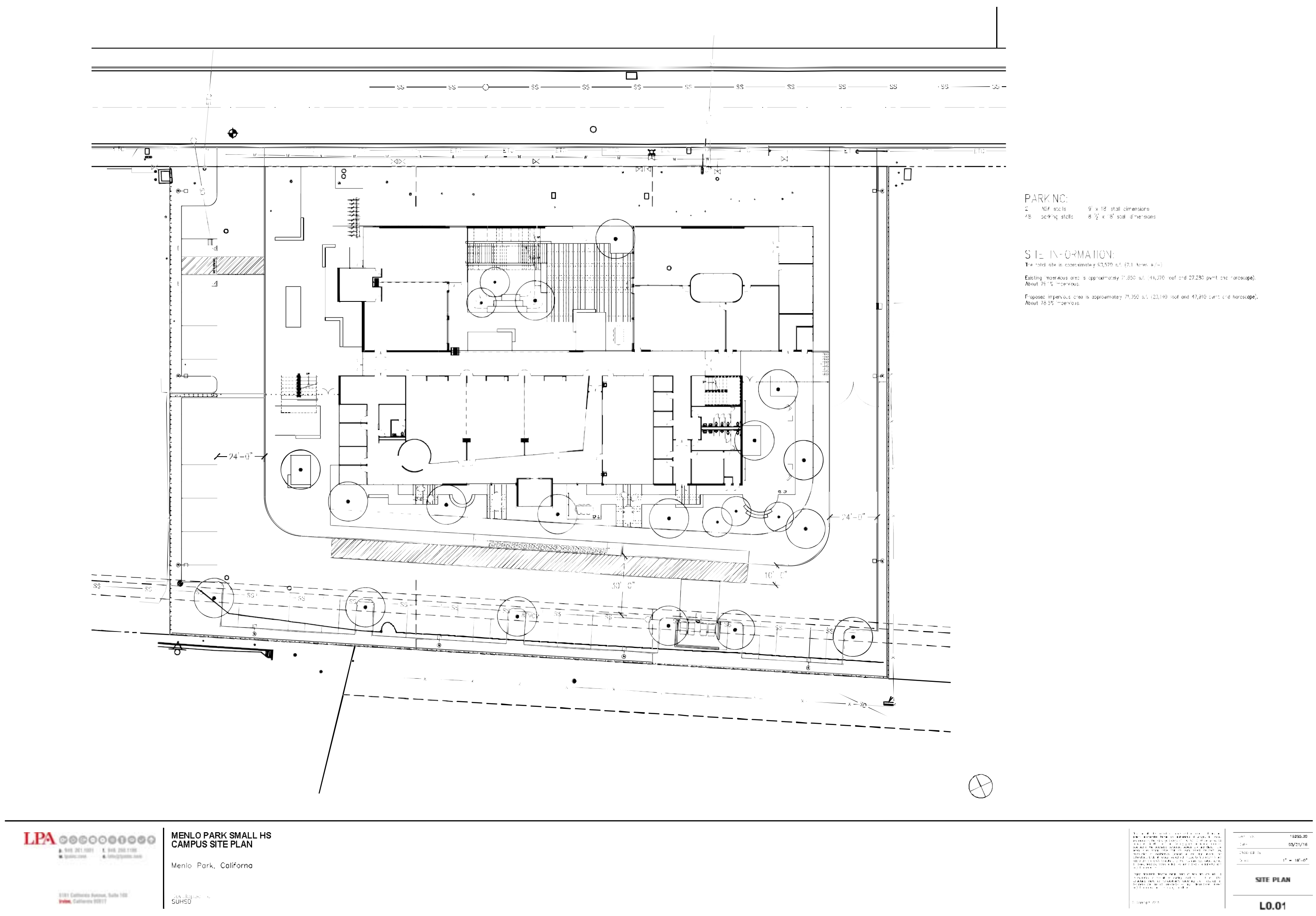

Figure 2
Proposed Project Site Plan

Study Intersections

The study intersections are identified below. It should be noted that some of the study intersections, although located in Menlo Park, are not in the City's jurisdiction, as indicated below (intersection jurisdiction in parenthesis).

1. Bayfront Expressway and Marsh Road* (State)
2. Constitution Drive and Independence Drive - Unsignalized (City of Menlo Park)
3. US 101 NB Ramps and Marsh Road (State)
4. US 101 SB Ramps and Marsh Road (State)
5. Bayfront Expressway and Chrysler Drive (State)
6. Constitution Drive and Chrysler Drive - Unsignalized (City of Menlo Park)
7. Jefferson Drive and Chrysler Drive - Unsignalized (City of Menlo Park)
8. Independence Drive and Chrysler Drive - Unsignalized (City of Menlo Park)
9. Constitution Drive and Jefferson Drive - Unsignalized (City of Menlo Park)
10. Bayfront Expressway and Chilco Street - (State)
11. Constitution Drive and Chilco Street - Unsignalized (City of Menlo Park)

*Denotes CMP intersection

Study Roadway Segments

The study roadway segments are identified below. All of the study roadway segments are under the jurisdiction of the City of Menlo Park. For roadway orientation reference, it is assumed in this analysis that US 101 and Bayfront Expressway run north-south within the study area.

1. Jefferson Drive, south of Chrysler Drive
2. Chrysler Drive, between Jefferson Drive and Constitution Drive
3. Chrysler Drive, between Constitution Drive and Bayfront Expressway
4. Independence Drive, north of Chrysler Drive
5. Constitution Drive, between Jefferson Drive and Chilco Street
6. Chilco Street, between Constitution Drive and Bayfront Expressway

Study Routes of Regional Significance

As the Congestion Management Agency for San Mateo County, C/CAG requires all land use change or new development projects that are projected to add 100 or more peak hour trips to the CMP roadway network and are subject to CEQA review to follow the CMP policy and guidelines. The CMP *Land Use Analysis Program* guidelines require that Routes of Regional Significance be evaluated to determine the impact of the additional traffic added by such projects. The study *Routes of Regional Significance* include the following:

1. US 101, north of Marsh Road
2. US 101, south of Marsh Road
3. Bayfront Expressway (SR 84), from US 101 to Willow Road (SR 14)

Study Freeway Interchange

US 101 provides regional access to the project site via its full interchange at Marsh Road. The freeway ramps that would be utilized by project traffic were evaluated. These include the following:

US 101 northbound off-ramp to Marsh Road
US 101 northbound on-ramp from westbound Marsh Road
US 101 southbound off-ramp to Marsh Road
US 101 southbound on-ramp from westbound Marsh Road

Study Time Periods

The proposed school hours of operation are Monday through Friday 8:15-8:30 AM to 3:30-3:45 PM. Therefore, traffic conditions at the study intersections were analyzed for the weekday AM and PM peak hours of traffic. The weekday AM peak-hour of traffic is typically one hour between 7:00 and 9:00 AM and the PM peak-hour is typically one hour between 4:00-6:00 PM. Although the school day would be over before 4:00 PM, as a conservative approach, it was assumed that school traffic associated with the end of the day dismissal would be on the roadway during the PM peak hour, providing a worst case traffic conditions.

Study Scenarios

Traffic conditions were evaluated for the following scenarios:

Scenario 1: *Existing Conditions.* Existing conditions represent existing traffic volumes on the existing roadway network. Existing traffic volumes for the study intersections were obtained from the City of Menlo Park and consist of AM and PM peak-hour turn movement volumes at intersections and average daily traffic (ADT) volumes at roadway segments. Additional roadway segment counts were obtained from Caltrans.

Scenario 2: *Existing Plus Project Conditions.* Existing plus project peak hour traffic volumes were estimated by adding to existing traffic volumes the additional traffic generated by the project. Existing plus project conditions were evaluated relative to existing conditions in order to determine the effects the project would have on the existing roadway network.

Scenario 3: *Near Term Conditions.* Near term traffic conditions represent traffic conditions just prior to the completion of the proposed project on the existing transportation network. Near term traffic volumes were estimated by adding to existing peak hour volumes the projected volumes from approved but not yet completed developments in the City of Menlo Park. Approved project information was provided by City staff. Additionally, a one percent (1%) per year growth of existing traffic volumes was assumed. Near term conditions represent the baseline conditions to which project conditions are compared for the purpose of determining project impacts.

Scenario 4: *Near Term Plus Project Conditions.* Near term plus project conditions, or simply referred to as *Project Conditions*, were estimated by adding to the near term traffic volumes the additional traffic estimated to be generated by the proposed project. Two near-term plus project conditions scenarios were evaluated:

- Year 2018 (school opening year/100 students) project conditions
- Year 2021 (maximum student enrollment/400 students) project conditions

Near term plus project conditions were evaluated relative to near term conditions in order to determine potential project impacts according to the City of Menlo Park Level of Service Policy.

Scenario 5: *Cumulative Conditions.* Cumulative conditions represent long-term traffic projections without and with the proposed project on the future transportation network. As stipulated by the City of Menlo Park *Transportation Impact Analysis Guidelines*, impacts of the project under cumulative conditions were evaluated for a span of ten years from existing conditions (year 2024). Cumulative conditions traffic volumes were estimated by adding to existing peak hour volumes the projected volumes from approved and pending projects in the City of Menlo Park (information provided by City staff) and applying an annual growth factor of 1% for ten years to the existing traffic volumes. Cumulative plus project conditions were estimated by adding to the cumulative traffic volumes the additional traffic estimated to be generated by the proposed project.

Methodology

This section presents the methods used to determine the traffic conditions for each scenario described above. It includes descriptions of the data requirements, the analysis methodologies, and the applicable level of service standards.

Data Requirements

The data required for the analysis were obtained from the City of Menlo Park, the San Mateo County CMP, Caltrans, previous traffic studies in the area, and field observations. The following data were collected from these sources:

- existing traffic volumes
- intersection lane configurations
- intersection signal timing and phasing
- a list of approved and potential projects

Analysis Methodologies and Level of Service Standards

Traffic conditions at the study intersections were evaluated using level of service (LOS). *Level of Service* is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays. The various analysis methods are described below.

Intersection Analyses

The study includes an analysis of eleven intersections in the vicinity of the project site. Although all the study intersections are located within the City of Menlo Park, some of the study intersections are not in the City's jurisdiction or are designated as CMP facilities. Nevertheless, all intersection were evaluated based on the City's adopted methodology and level of service standards.

According to the City of Menlo Park *Transportation Impact Analysis Guidelines*, as of January 2014, the City has adopted the use of the VISTRO software as the analysis model for the evaluation of projects in the City of Menlo Park. Additionally, for consistency with the methodology applied in the intersection analysis for the City's *Circulation* report of the *General Plan Update* (January 2015), the intersection analysis is based on the *Highway Capacity Manual* (HCM) 2000 methodology.

City of Menlo Park Intersections

The signalized intersections were analyzed using the level of service methodology for signalized intersections in the HCM2000. The HCM2000 operations method evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. The correlation between delay and level of service for signalized intersections is shown in Table 1.

Level of service at unsignalized intersections also was based on the HCM2000 method. This method is applicable for both two-way and all-way stop-controlled intersections. For the analysis of stop-controlled intersections, the HCM2000 methodology evaluates intersection operations on the basis of average control delay time for all vehicles on the stop-controlled approaches. For the purpose of reporting level of service for one- and two-way stop-controlled intersections, the delay and corresponding level of service for the stop-controlled minor street approach with the highest delay is reported. For all-way stop-controlled intersections, the reported average delay and corresponding level of service is the average for all approaches at the intersection. The correlation between average control delay and level of service for unsignalized intersections is shown in Table 2.

Table 1
Signalized Intersection Level of Service Definitions Based on Average Control Delay

Level of Service	Description	Average Control Delay Per Vehicle (Sec.)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	Up to 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	Greater than 80.0
Source: Transportation Research Board, 2000 Highway Capacity Manual. (Washington, D.C., 2000)		

Table 2
Unsignalized Intersection Level of Service Definitions Based on Average Control Delay

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Operations with vey low delays occurring with favorable progression.	Up to 10.0
B	Operations with low delays occurring with good progression.	10.1 to 15.0
C	Operations with average delays resulting from fair progression.	15.1 to 25.0
D	Operation with longer delays due to a combination of unfavorable progression and high V/C ratios.	25.1 to 35.0
E	Operation with high delay values indicating poor progression and high V/C ratios. This is considered to be the limited of acceptable delay.	35.1 to 50.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation and poor progression.	Greater than 50.0
Source: Transportation Research Board, *2000 Highway Capacity Manual*. (Washington, D.C., 2000)		

The intersection level of service standards are dependent of their relevant roadway classification. According to the City's Transportation Impact Analysis Guidelines, intersections on a local or collector street have a level of service standard of LOS C while intersection of arterial streets or local approaches to State controlled signalized intersections have a level of service standard of LOS D.

CMP Intersection

The study intersection of *Bayfront Expressway (SR 84) and Marsh Road* is also designated as a CMP intersection by C/CAG. As the Congestion Management Agency for San Mateo County, C/CAG is responsible for maintaining the performance and standards of the CMP roadway network. The CMP roadway network includes 53 roadway segments and 16 intersections within San Mateo County.

The CMP study intersection was not analyzed separately, but rather it was analyzed among the City of Menlo Park intersections utilizing the HCM2000 methodology. Based on CMP standards, the intersection of Bayfront Expressway and Marsh Road has a LOS E standard.

Although the intersection of Bayfront Expressway and Marsh Road is monitored by C/CAG for compliance with CMP standards, the intersection is located within the City of Menlo Park and, therefore, it is also subject to the City's level of service standard and impact criteria. Thus, the study CMP intersection was evaluated based on City of Menlo Park more stringent level of service standards of LOS D.

State (Caltrans) Intersections

Intersections under the State (Caltrans) jurisdiction also were evaluated based on the HCM2000 methodology and among the City of Menlo Park intersections. This is the methodology recommended in the Caltrans *Guide for the Preparation of Traffic Impact Studies*. The Caltrans level of service standard for intersections is LOS C or better. However, Caltrans acknowledges that a LOS C standard may not always be feasible, particularly in urban environments where right-of-way is constraint and traffic levels are high. For this reason, if maintaining a LOS C is not feasible, Caltrans attempts to maintain the existing level of service of service when assessing the impact of a new project.

For the purpose of this study, and for consistency with previous traffic studies, the City of Menlo Park level of service standard for State-controlled intersections (LOS D) also was applied to State intersections.

Roadway Segment Analysis

The roadway segment analysis consists of the comparison of the study roadway segment's average daily traffic (ADT) volumes to the segment's designated capacity, which is based on the roadway's classification. It should be noted that the City of Menlo Park does not designate a roadway as operating acceptably or unacceptable, as it is done for the analysis of intersections. Instead, as described in the City's *Circulation System Assessment* document, the City only considers if a proposed project would contribute to an acceptable or unacceptable level of growth on the roadway.

The City identifies the following capacity thresholds for its roadway facilities:

- Minor arterial street - 20,000 vehicles per day
- Collector street - 10,000 vehicles per day
- Local street - 1,500 vehicles per day

Routes of Regional Significance

The CMP *Land Use Analysis Program* guidelines require that Routes of Regional Significance be evaluated to determine the impact of the additional traffic projected to be generated by new projects adding 100 or more peak hour trips to the CMP roadway network. The study routes of regional significance include two freeway segments and one arterial segment.

Freeway Segments

According to the CMP's *Traffic Level of Service Calculation Methods* document, the selected LOS method for freeway segments is based on calculating V/C ratios for each direction of travel, wherein the traffic volume for each segment is divided by the capacity of the segment. The volumes are obtained from existing counts or are forecasted. The capacity of the segment is estimated based on the number of lanes and a capacity of 2,200 vehicles per hour per lane (vphpl) for four-lane freeway segments and 2,300 vphpl for segments with six or more lanes. The correlation between V/C ratios and level of service for freeway segments is presented in Table 3.

According to the 2015 CMP Monitoring Report, the study freeway segments on US 101 have a level of service standard of LOS F.

Arterials

Based on the CMP level of service methods, the level of service method for arterial roadway segments also is based on V/C ratios. The capacity for arterial roadway segments is estimated to be 1,100 vphpl (approximately 60% green time of 1,900 vphpl saturation flow rate). The correlation between V/C ratios and level of service for arterial roadway segments is presented in Table 4.

According to the 2015 CMP Monitoring Report, the study roadway segment of SR 84 has a level of service standard of LOS D.

Freeway Interchange Ramp Analysis

The analysis of one freeway interchange serving the project area was performed in order to identify potential project impacts on ramp operations. The freeway ramp analysis was performed at the interchange of US 101 at Marsh Road. This interchange provides regional access to/from US 101 to the project site. The analysis is based on calculated V/C ratios at the study freeway ramps.

Evaluation of the ramps' operating levels is based on Caltrans level of service standards. (LOS C or better). The correlation between V/C ratio and level of service is shown in Table 4.

Significant Impact Criteria

Significance criteria are used to establish what constitutes an impact. For this analysis, the set of relevant criteria for impacts on intersections is based on Level of Service standards and significance thresholds for the City of Menlo Park, the CMP, and Caltrans. Project impacts on the study routes of regional significance and the study freeway interchange were evaluated based on CMP and Caltrans level of service standards and impact criteria, respectively.

The impact criteria for the study facilities are described below.

Intersections

City of Menlo Park Intersections

The City of Menlo Park significant impact criteria are dependent of the relevant roadway classification. As described previously, intersections along local and collector streets have a level of service standard of LOS C while intersection of arterial streets or local approaches to State controlled signalized intersections have a level of service standard of LOS D. Therefore, the significant impact criteria, as defined in the City's *Transportation Impact Analysis Guidelines*, are broken down into the following types of facilities:

Table 3
Freeway Segment Level of Service Definitions Based on Volume to Capacity Ratio

LOS	Maximum[1] V/C
A	0.283
B	0.457
C	0.673
D	0.849
E	1.000
F	Variable

Notes:
[1]Maximum volume-to-capacity ratio for freeway segments with six to eight travel lanes and 65 miles per hour free-flow speed.
Source: Transporation Research Board, *Highway Capacity Manual,* Special Report 209 (Washington, D.C., 1994).

Table 4
Level of Service Definitions Based on Volume-to-Capacity Ratio

Level of Service	V/C Ratio
A	Less than 0.600
B	0.600-0.699
C	0.700-0.799
D	0.800-0.899
E	0.900-0.999
F	1.000 and Greater

Source: Transportation Research Board, *2000 Highway Capacity Manual*. (Washington, D.C., 2000)

Arterial Intersections

Intersections operating at acceptable levels: a project is considered to have a potentially “significant” traffic impact if the addition of project traffic causes an intersection on arterial streets operating at LOS A through D to operate at an unacceptable level (LOS E or F) or have an increase of 23 seconds or greater in average vehicle delay, whichever comes first.

Intersections operating at unacceptable levels: a project is considered to have a potentially “significant” traffic impact if the addition of project traffic causes an increase of more than 0.8 seconds of average delay to vehicles on all critical movements for arterial intersections operating at a near term LOS E or F.

Collector/Local Street Intersections

Intersections operating at acceptable levels: a project is considered to have a potentially "significant" traffic impact if the addition of project traffic causes an intersection on collector/local streets operating at LOS A through C to operate at an unacceptable level (LOS D, E or F) or have an increase of 23 seconds or greater in average vehicle delay, whichever comes first.

Intersections operating at unacceptable levels: a project is considered to have a potentially "significant" traffic impact if the addition of project traffic causes an increase of more than 0.8 seconds of average delay to vehicles on all critical movements for collector intersections operating at a near term LOS D, E, or F.

State-Controlled (Caltrans) with Local Approaches Intersections

Intersections operating at acceptable levels: a project is considered to have a potentially "significant" traffic impact if the addition of project traffic causes the local approaches to State-controlled signalized intersections operating at LOS A through D to operate at an unacceptable level (LOS E or F) or have an increase of 23 seconds or greater in average vehicle delay, whichever comes first.

Intersections operating at unacceptable levels: a project is considered to have a potentially "significant" traffic impact on local approaches if the addition of project traffic causes an increase of more than 0.8 seconds of delay to vehicles on the most critical movements for State-controlled signalized intersections operating at a near term LOS E or F.

CMP Intersections

According to the 2015 CMP Monitoring Report, the intersection of Bayfront Expressway and Marsh Road has a LOS E standard. Since the City of Menlo Park has a more stringent level of service standard, the CMP intersection was evaluated based on the City's level of service standards (LOS D) and impact criteria (described above) for State-controlled intersections.

State (Caltrans) Intersections

State-controlled intersections (including those with local approaches, as identified above under City of Menlo Park intersections) are evaluated based on Caltrans level of service impact criteria. Caltrans identifies a level of service standard of LOS C for their facilities. However, Caltrans acknowledges that a LOS C standard may not always be feasible, particularly in urban environments where right-of-way is constraint and traffic levels are high. For this reason, and for consistency with previous traffic studies, the City of Menlo Park level of service standard for State-controlled intersections (LOS D) was applied to Caltrans intersections.

In addition to being evaluated based on the City's impact criteria (impact criteria for State-controlled intersections), Caltrans intersections also were evaluated following the level of service standards and impact criteria adopted by Caltrans.

Based on Caltrans level of service impact criteria, the project is said to create a significant adverse impact on traffic conditions at an intersection if for either peak-hour:

- The level of service at the study intersection degrades from an acceptable LOS C or better under baseline conditions to an unacceptable LOS D or worse under project conditions, or
- The project results in an increase of 4 seconds or more in the intersection's average control delay.

The study intersections level of service standard and applicable significant impact criteria are summarized in Table 5.

Table 5
Study Intersections Level of Service Standard and Impact Criteria

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Significant Impact Threshold (see definition)
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches)/ CMP	D	b/c
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	C	a
3	US-101 NB Ramps and Marsh Road	Signal	State	D	c
4	US-101 SB Ramps and Marsh Road	Signal	State	D	c
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local approaches)	D	b/c
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	C	a
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	a
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	a
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	C	a
10	Bayfront Expressway and Chilco Street	Signal	State (with local approaches)	D	b/c
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	C	a

	Significant Impact Theshold Definitions
a	City of Menlo Park (Collector) - LOS becomes D, E, or F (or have an increase of 23 seconds or greater in average delay) <u>OR</u> if currently LOS D, E, or F and average critical delay increases by 0.8 seconds or more
b	City of Menlo Park (State with local approches) - LOS becomes E or F (or have an increase of 23 seconds or greater in average delay on the local approach) <u>OR</u> if currently LOS E or F and average critical delay on the local approach increases by 0.8 seconds or more
c	State - LOS becomes E or F <u>OR</u> if currently LOS E or F and project causes the intersection average control delay to increase by 4 seconds or more

Notes:
Level of service standards and significant impact criteria for Menlo Park, State (with local approaches), and CMP intersections are based on the City of Menlo Park adopted level of service standards and significance thresholds.
Level of service standards and significant impact criteria for State intersections (including those with local approaches) is based on Caltrans adopted level of service standards and significance thresholds.

Roadway Segments

City Roadway Segments

As mentioned previously, the City of Menlo Park does not designate a roadway as operating acceptably or unacceptable, as it is done for the analysis of intersections. Instead, an assessment is made comparing the study roadway segment's ADT volumes to the segment's capacity and the City only considers if a proposed project would contribute to an acceptable or unacceptable level of growth on the roadway. For this reason, the City roadway segment analysis is provided for informational purposes to disclose when acceptable traffic level thresholds on roadway segments are exceeded.

The City of Menlo Park identifies the following volume thresholds as potentially significant:

Minor Arterials

A traffic impact may be considered potentially significant if the existing Average Daily Traffic (ADT) is:

(1) greater than 18,000 (90% of capacity), and there is a net increase of 100 trips or more in ADT due to project related traffic;
(2) the ADT is greater than 10,000 (50% of capacity) but less than 18,000, and the project related traffic increases the ADT by 12.5% or the ADT becomes 18,000 or more; or
(3) the ADT is less than 10,000, and the project related traffic increases the ADT by 25%.

City Collectors

A traffic impact may be considered potentially significant if the existing ADT is:

(1) greater than 9,000 (90% of capacity), and there is a net increase of 50 trips or more in ADT due to project related traffic;
(2) the ADT is greater than 5,000 (50% of capacity) but less than 9,000, and the project related traffic increases the ADT by 12.5% or the ADT becomes 9,000 or more; or
(3) the ADT is less than 5,000, and the project related traffic increases the ADT by 25%.

Local Streets

A traffic impact may be considered potentially significant if the existing ADT is:

(1) greater than 1,350 (90% of capacity), and there is a net increase of 25 trips or more in ADT due to project related traffic;
(2) the ADT is greater than 750 (50% of capacity) but less than 1,350, and the project related traffic increases the ADT by 12.5% or the ADT becomes 1,350; or
(3) the ADT is less than 750, and the project related traffic increases the ADT by 25%.

Routes of Regional Significance

The study routes of regional significance include two freeway segments and one major arterial segment. According to the 2015 CMP Monitoring Report, the study freeway segments on US 101 have a level of service standard of LOS F while the study roadway segment of SR 84 has a level of service standard of LOS D. The definition of CMP impacts for freeway and arterial segments are described below.

Freeway Segments

For freeway segments currently in compliance with the adopted LOS standard, a project is considered to have a CMP impact if:

- The project will cause the freeway segment to operate at a level of service that violates the standard adopted in the current CMP.

- The cumulative analysis indicates that the combination of the proposed project and future cumulative traffic demand will result in the freeway segment to operate at a level of service that violates the standard adopted in the current CMP and the proposed project increases traffic demand on the freeway segment by an amount equal to one percent (1%) or more of the segment capacity, or cause the freeway segment volume-to-capacity (V/C) ratio to increase by 1%.

For freeway segments currently not in compliance with the adopted LOS standard, a project is considered to have a CMP impact if:

- The project will add traffic demand equal to 1% or more of the segment capacity or causes the freeway segment V/C ratio to increase by 1%.

CMP Arterial Segments

According to the definition of CMP impacts, the analysis of arterial segments is only required when a jurisdiction proposes to reduce the capacity of a CMP designated arterial through reduction in the number of lanes, adding or modifying on-street parking, or other actions that will affect arterial segment performance. However, for the purpose of this analysis, and for consistency with previous traffic studies, a project is considered to have an impact on the study major arterial segment if:

- The project causes the segment's V/C ratio to increase by 1% or more.

Freeway Interchange

Caltrans identifies a level of service standard of LOS C for their facilities, including freeway interchanges. Based on Caltrans level of service impact criteria, the project is said to create a significant adverse impact on traffic conditions at the study interchange ramps if for either peak-hour:

- The level of service at the study interchange ramp degrades from an acceptable LOS C or better under baseline conditions to an unacceptable LOS D or worse under project conditions, or
- The project results in the addition of trips to an interchange ramp that is already operating at unacceptable levels.

Site Access and On-Site Circulation

The analyses of site access and on-site circulation are based on professional judgment in accordance with the standards and methods employed by the traffic engineering community.

Report Organization

The remainder of this report is divided into five chapters. Chapter 2 describes existing conditions including the existing roadway network, transit service, and existing bicycle and pedestrian facilities. Chapter 3 describes the method used to estimate project traffic and the resulting traffic conditions expected under Existing plus Project conditions. Chapter 4 presents the intersection operations under near term traffic conditions. Chapter 5 presents traffic conditions and potential project impacts and recommended mitigation measures under near term plus project conditions. Chapter 6 presents the future traffic conditions expected under cumulative without and with the project conditions. Chapter 7 presents the analysis of other transportation related issues, including site access and on-site circulation, parking, drop-off/pick-up school activity, traffic signal warrants, and impacts to transit and bicycle facilities. Chapter 8 presents the conclusions of the traffic impact analysis.

2.
Existing Conditions

This chapter describes existing conditions for all of the major transportation facilities in the vicinity of the site, including the roadway network, transit service, and bicycle and pedestrian facilities. Also included are the existing levels of service of the key facilities in the study area.

Existing Roadway Network

Regional access to the project site is provided via US 101 and Bayfront Expressway (SR 84). Local access to the site is provided by Marsh Road, Independence Drive, Constitution Drive, Chrysler Drive, Chilco Street, and Jefferson Drive. These facilities are shown on Figure 1 and described below.

For roadway orientation reference, it is assumed in this analysis that US 101 and Bayfront Expressway (and all roadways parallel to them) run north-south within the study area.

US 101 is a north-south eight-lane freeway in the vicinity of the project site. It extends northward to San Francisco and southward through Gilroy and has a posted speed limit of 65 miles per hour (mph). There are high-occupancy vehicle (HOV) lanes in both directions of US 101 in the study area. Existing access to and from the project site is provided via a full interchange at Marsh Road, located approximately half a mile from the project site. Other interchanges with US 101 that also provide access to the project site include the interchange at Willow Street, located more than two miles south of the project site.

Bayfront Expressway (SR 84) is a divided State highway (Caltrans' jurisdiction) with three lanes in each direction. In the vicinity of the project site, Bayfront Expressway runs north-south and has a speed limit ranging from 45 to 50 mph. SR 84 connects Menlo Park with the East Bay via the Dumbarton Bridge, and with Highway 1 and the community of San Gregorio via Woodside and La Honda. SR 84 also is a designated CMP facility.

Marsh Road is an east/west roadway that runs between Middlefield Road in the Town of Atherton and Bayfront Expressway. The City of Menlo Park General Plan classifies Marsh Road as a primary arterial between Bohannon Drive and Bayfront Expressway and as a minor arterial between Bay Road and Bohannon Expressway. Marsh Road consists of a six-lane roadway between US 101 and Bayfront Expressway and narrows down to 4 lanes between US 101 and Bay Road. The posted speed limit on Marsh Road is 35 mph.

Independence Drive is a north-south two-lane undivided roadway that extends between Marsh Road and Chrysler Drive. Its intersection with Marsh Road provides limited access to the project area (right-in access from eastbound Marsh Road only). The City of Menlo Park General Plan classifies Independence Drive as a local street. Independence Drive has a speed limit of 25 mph.

Constitution Drive is a north-south two-lane undivided roadway that extends between Independence Drive and Chilco Drive. The City of Menlo Park General Plan classifies Constitution Drive as a collector street. Constitution Drive has a speed limit of 35 mph.

Chrysler Drive is an east-west two-lane roadway that extends between Commonwealth Drive and Bayfront Expressway. Regional access to/from the project site is provided by Bayfront Expressway via Chrysler Drive. The City of Menlo Park General Plan classifies Chrysler Drive as a collector street between Constitution Drive and Bayfront Expressway and as a local street west of Constitution Drive. Chrysler Drive has a speed limit of 35 mph.

Chilco Street is mainly a two-lane undivided roadway that extends between Bayfront Expressway and Windermere Avenue in the Belle Haven neighborhood. Chilco Drive provides regional access to/from the project site via its intersection with Bayfront Expressway as well as access to/from the Belle Haven neighborhood. The City of Menlo Park General Plan classifies Chilco Street as a collector street between Constitution Drive and Bayfront Expressway and as a local street west of Constitution Drive. The speed limit on Chilco Drive ranges from 25 mph (in the Belle Haven neighborhood), 35 mph (near Bayfront Expressway), and 40 mph (near the railroad tracks).

Jefferson Drive is a north-south two-lane undivided roadway that extends between Chrysler Drive and Constitution Drive. The City of Menlo Park General Plan classifies Jefferson Drive as a local street. It has a speed limit of 25 mph with on-street parking along both sides of the street. As the northern project site boundary, Jefferson Drive provides direct access to the project site.

Existing Bicycle and Pedestrian Facilities

The City of Menlo Park *Circulation* Public Review Draft Report, dated January 2015, of the General Plan Update, describes the different bicycle facilities within the City, according to California's system of classifications of bikeways. The bicycle facilities include:

- Class I Bikeway – bike paths within exclusive right-of-way, sometimes shared with pedestrians
- Class II Bikeway – bike lanes for bicycle use only that are striped within the paved area of roadways
- Class III Bikeways – bike routes that are shared with motor vehicles on the street. Class III bikeways may be defined by a wide curb lane and/or use of a shared use arrow stencil marking on the pavement known as a "sharrow"
- Class IV Bikeways – cycle tracks or separated bikeways that contain dedicated right-of-way with physical separation, such as grade separation, flexible posts, or on-street parking

The San Francisco Bay Trail (Class I bikeway) runs through Menlo Park along Bayfront Expressway (generally on the north side) between Haven Avenue and the Dumbarton Bridge.

In the vicinity of the project site, Class II bikeways are provided along Chilco Street, between Bayfront Expressway and just south of the railroad tracks (north of Hamilton Avenue). Other bike lanes in the general project area include the following:

- Willow Road (along its entire length although a gap exists along the US 101 interchange)
- Bay Road (between Marsh Road and ending north of Willow Road)
- University Avenue (between O'Brien Drive and Bayfront Expressway)
- Middlefield Road (between Marsh Road and Willow Road)
- Ringwood Avenue (between Middlefield Road and Bay Road)

Some Class III bicycle routes exist in Menlo Park and are typically designated to connect neighborhoods and Class II facilities. For example, a Class III bike route provides a connection over US 101 between the Class II bike lanes on Willow Road.

No bicycle facilities are currently provided in the immediate vicinity of the project site, and therefore, bicyclist must share the roadway with vehicular traffic. The existing bicycle facilities in the study area are presented graphically on Figure 3.

Pedestrian facilities in the project area consist primarily of sidewalks along the streets as well as marked crosswalks at intersections and pedestrian push buttons and signal heads at signalized intersections. In the immediate vicinity of the project site, sidewalks are found along at least one side of the street on all previously described roadways in the study area, with the exception of Bayfront Expressway. Sidewalks are provided along both sides of all streets within the Belle Haven neighborhood and along Marsh Road. Partial sidewalks (either sidewalks are partially or complete missing along at least one side of the road) are found along Jefferson Drive, Independence Drive, Constitution Drive, Chrysler Drive, and Chilco Street. Sidewalks are found along most of the west side of Jefferson Drive and only along a few segments on the east side of the street. Although no sidewalks are providing along Bayfront Expressway, the San Francisco Bay Trail runs along the east side of Bayfront Expressway and can be used by both pedestrians and bicyclists.

All of the signalized intersections in the vicinity of the project site have marked crosswalks and include pedestrian push buttons and signal heads.

Existing Transit Service

Existing transit service in Menlo Park is provided by the San Mateo County Transit District (Samtrans), Caltrain, and the Alameda-Contra Costa Transit District (AC Transit). The existing transit services are described below. The description of the existing transit services is based on the information provided in the Samtrans and AC Transit's website, April 2016. The existing transit services in the vicinity of the project site are shown on Figure 4.

Samtrans Services

The study area is served directly by one shuttle route. The ***Marsh Road Shuttle*** route provides free shuttle service between the Menlo Park Caltrain Station and the project area on weekdays. This service is available to the general public and is funded by the City of Menlo Park and through grants by agencies such as Caltrain, C/CAG, and the Bay Area Air Quality Management District. The shuttle runs along Middlefield Road, Marsh Road, Constitution Drive, Jefferson Drive, Chilco Street, and Bayfront Expressway with scheduled stops directly at the project site (at 150 Jefferson Drive). Four trips are made from the Menlo Park Caltrain Station to the project area between 6:58 and 9:25 AM, with the last trip arriving at the project site around 9:42 AM. Five trips are made in the afternoon/evening, with the stops at the project site scheduled for 2:27, 3:31, 4:09, 4:44, and 5:51 PM.

Although the Marsh Road Shuttle route is the only transit service currently serving the project site directly, other transit services in the general project area include ***Routes 82, 88, 270, and 281.*** These local bus routes are described below.

Local Route 82 provides service during school days only between the intersection of Bay Road and Marsh Road and Hillview School. One trip (from Bay Road/Marsh Road to Hillview School) is provided in the morning, between 7:42 and 8:07 AM and two trips (from Hillview School to Bay Road/Marsh Road) is provided in the afternoon, between 2:35 and 3:44 PM on selected days.

Local Route 88 provides service during school days only between the intersection of Bay Road and Marsh Road and Encinal Elementary School. One trip (from Bay Road/Marsh Road to Encinal Elementary School) is provided in the morning, between 7:17 and 7:50 AM and two trips (from Encinal Elementary School to Bay Road/Marsh Road) is provided in the afternoon, between 2:02 and 3:43 PM on selected days.

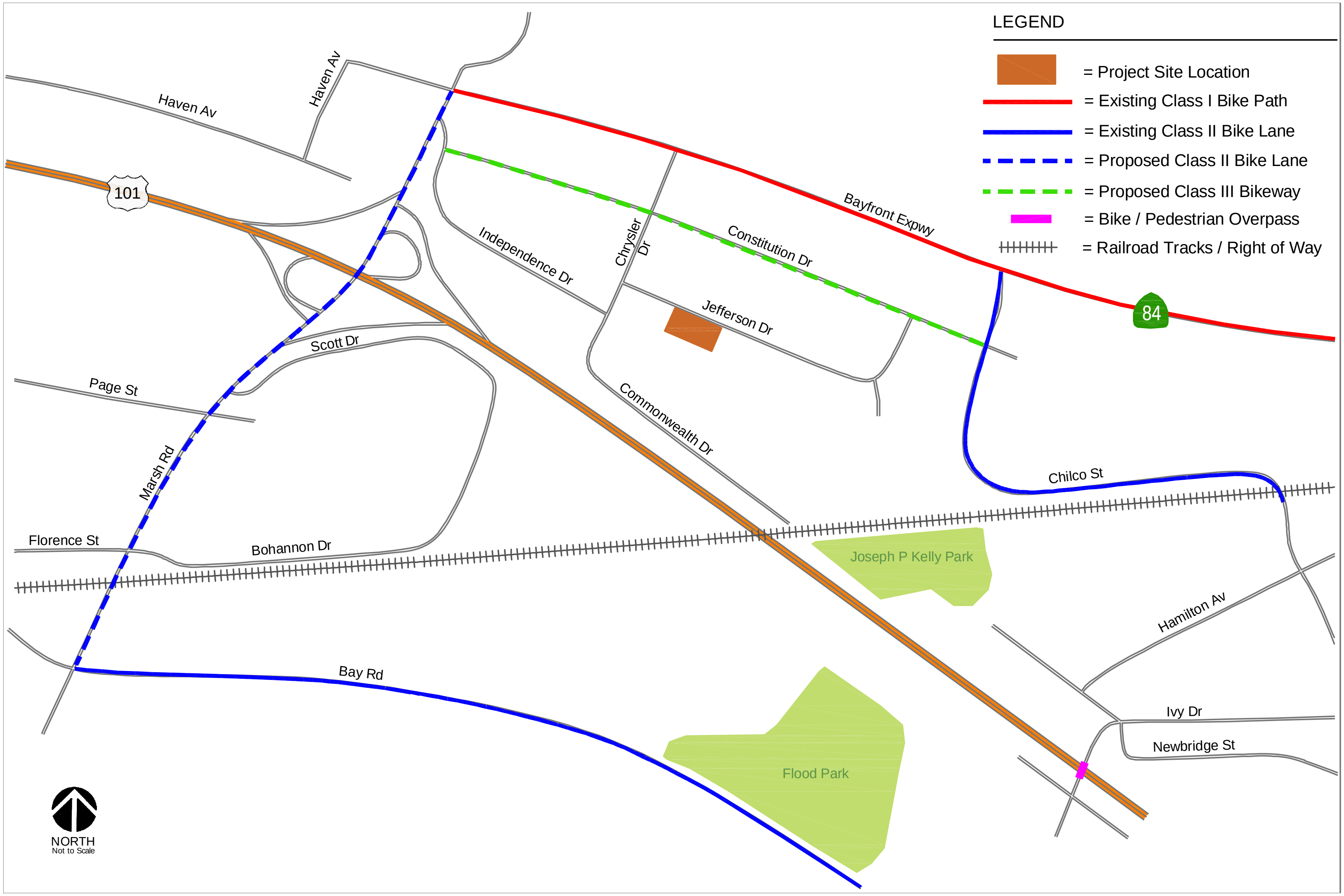

Figure 3
Existing Bicycle Facilities

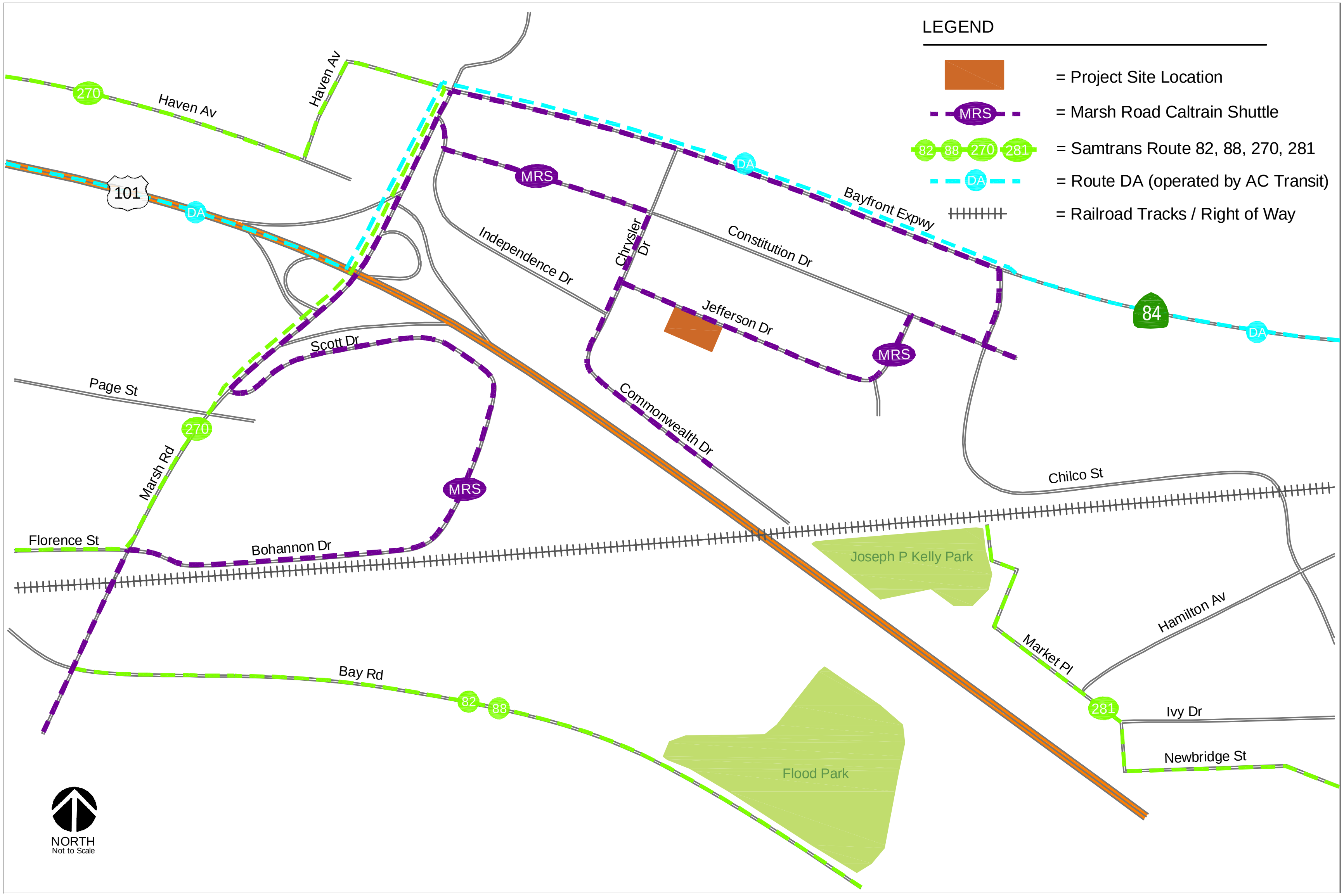

Figure 4
Existing Transit Services

Local Route 270 provides service to the Redwood City Transit Center via Bay Road, Marsh Road, and Haven Avenue in the vicinity of the project site. The closest bus stop to the project site for Route 270 is located along Haven Avenue, north of Marsh Road. Route 270 operates on weekdays and Saturdays with 60-minute headways.

Local Route 281 provides service to the Stanford Shopping Mall and Onetta Harris Center via New Bridge Street and Ivy Drive in the Belle Haven neighborhood. Route 281 operates seven days a week with 15-minute headways during the weekday peak commute hours.

Caltrain

Caltrain operates a commuter rail service seven days a week between the Diridon Station in San Jose and San Francisco. During weekday commuting hours, Caltrain also serves south San Jose and the south county including Gilroy, San Martin, and Morgan Hill.

The Menlo Park Caltrain Station is located near the Downtown area, at the north-east corner of the El Camino Real/Ravenswood Avenue intersection. The Menlo Park Caltrain Station serves the project area via the Marsh Road Shuttle. The Marsh Road Shuttle is scheduled to serve trains arriving from San Francisco between 6:56 and 9:25 AM (six trains) and 3:14 and 6:19 PM (seven trains), and from San Jose between 6:39 and 9:17 AM (seven trains) and 3:02 and 6:36 PM (six trains).

AC Transit

Other transit service provider in the City of Menlo Park include AC Transit. AC Transit provides transit service between the East Bay and the Peninsula, with scheduled stops in the City of Menlo Park. AC Transit routes include the “U” line and the Dumbarton Express routes DB and DB1. These bus lines do not serve the project site area directly.

The “U” line provides service between the Fremont BART Station and Stanford University via the Dumbarton Bridge (SR 84) and Willow Road with five trips from Fremont to Stanford between 5:55 and 8:11 AM and six trips from Stanford to Fremont between 2:45 and 5:55 PM.

The DB route provides service between the Union City Bart Station and Stanford University on Mondays through Fridays (except holidays) via Dumbarton Bridge, Willow Road, and University Avenue.

The DB1 route provides service between the Union City Bart Station and the Stanford Research Park on Mondays through Fridays (except holidays) via Dumbarton Bridge, US 101, and Oregon Expressway.

Existing Intersection Lane Configurations

The existing lane configurations at the study intersections were provided by City staff and confirmed by observations in the field. The existing intersection lane configurations are shown on Figure 5.

Existing Traffic Volumes

Existing intersection volumes were obtained from the City of Menlo Park and consist of AM and PM peak-hour turn movement volumes included in the *Circulation - Existing Conditions Report*, January 2015, which is part of the City's *General Plan Update*. Local roadway counts were obtained from the Circulation report while counts for state facilities (roadway segments and interchange ramps) were obtained from Caltrans. The existing peak-hour intersection volumes are shown on Figure 6.

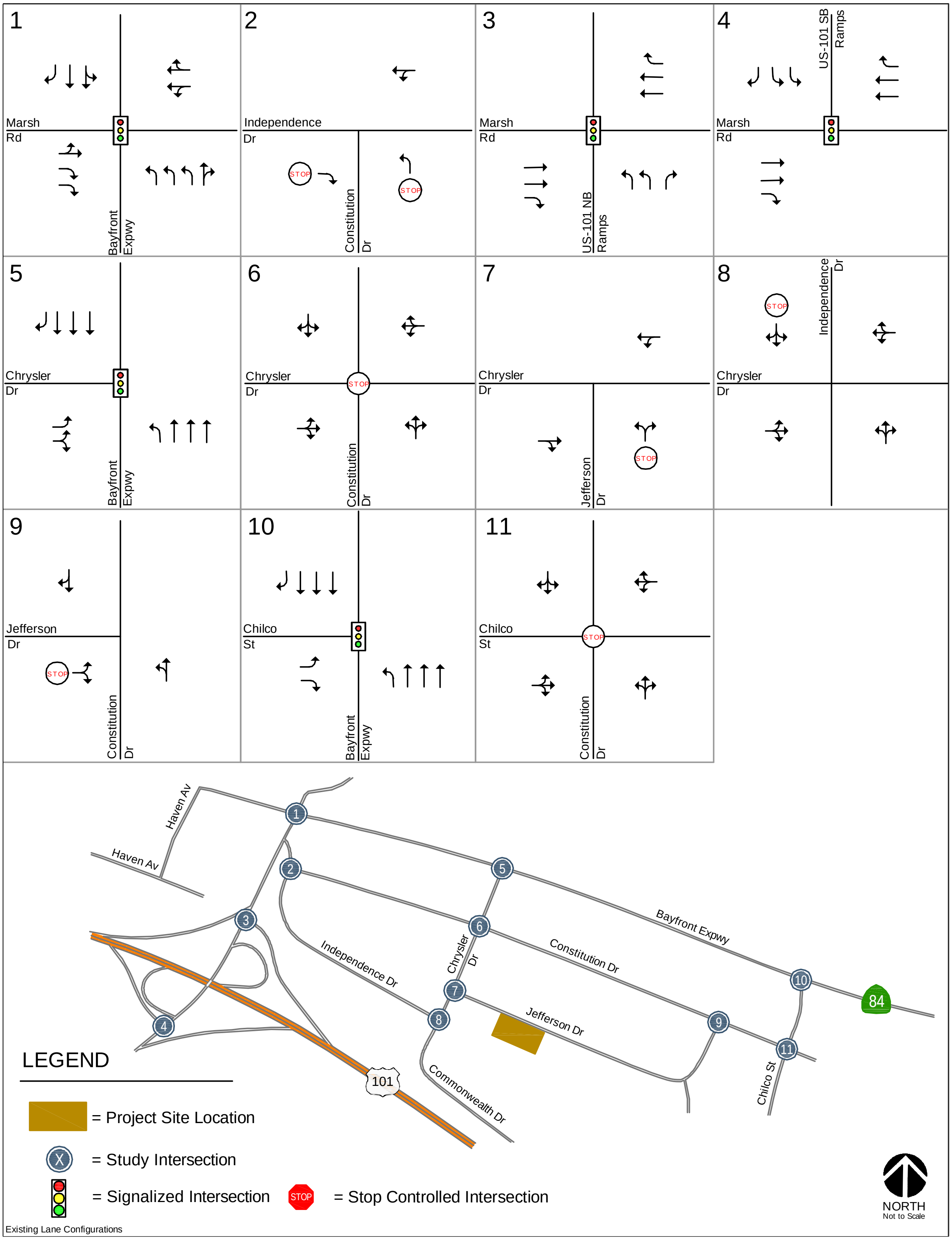

Figure 5
Existing Lane Configurations

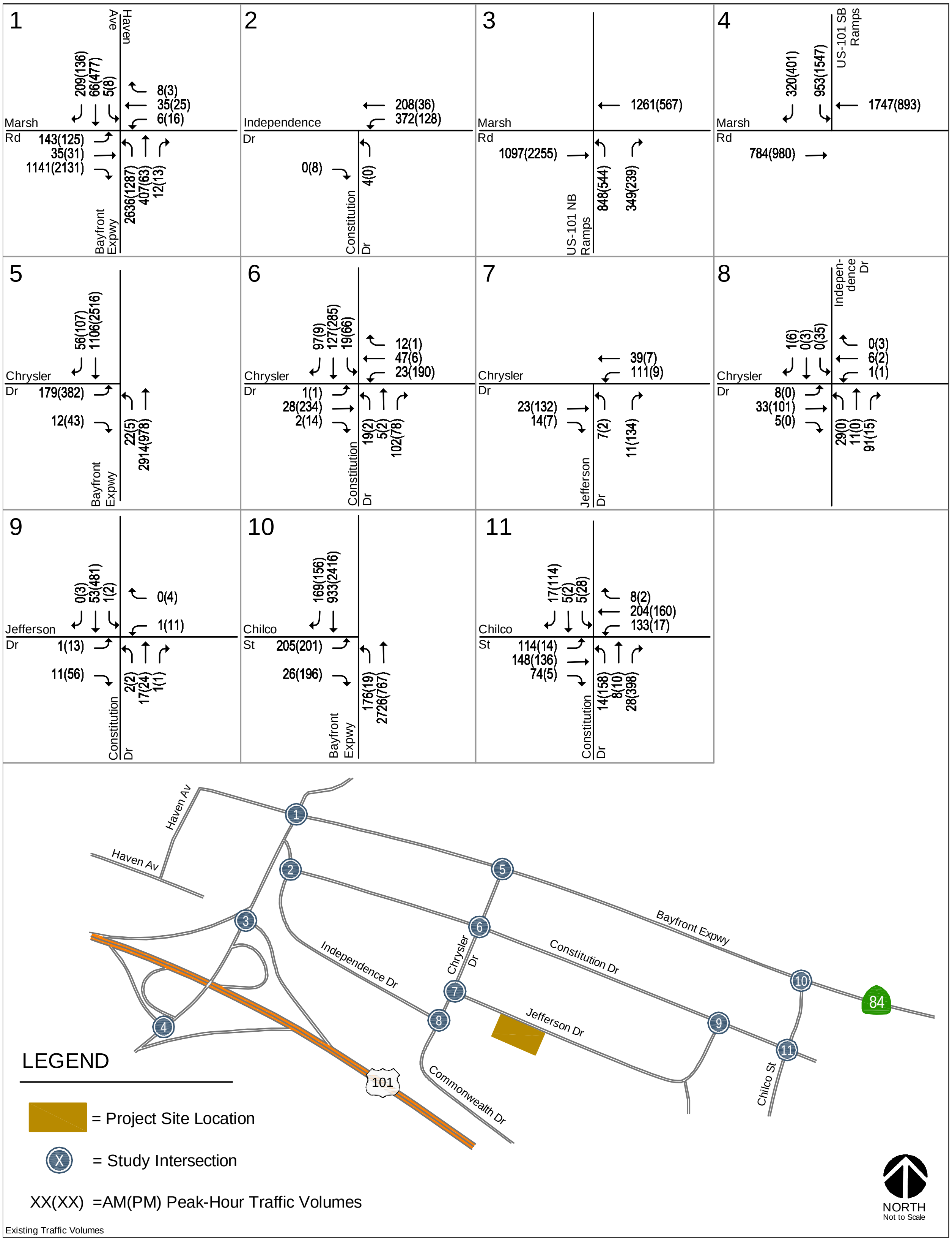

Figure 6
Existing Traffic Volumes

Existing Intersection Levels of Service

Intersection levels of service were evaluated against City of Menlo Park and Caltrans standards. The results of the intersection level of service analysis under existing conditions are summarized in Table 6.

City of Menlo Park Intersections

The results of the level of service analysis show that, measured against the City of Menlo Park level of service policy, the study intersection of *Bayfront Expressway and Marsh Road* (intersection #1) currently operate at unacceptable LOS F during both the AM and PM peak hours.

The remainder of the study intersections are shown to currently operate at acceptable levels of service during both the AM and PM peak hours.

Caltrans Intersections

The results of the level of service analysis show that, measured against LOS D standard, the Caltrans intersection of *Bayfront Expressway and Marsh Road* (intersection #1) currently operates at an unacceptable LOS F during both the AM and PM peak hours.

The remainder of the Caltrans study intersections are shown to currently operate at acceptable levels of service during both the AM and PM peak hours. The intersection level of service calculation sheets are included in Appendix B.

Existing Roadway Segment Analysis

The roadway segment analysis consists of the comparison of the study roadway segment's average daily traffic (ADT) volumes to the segment's designated capacity, which is based on the roadway's classification. Although the City of Menlo Park does not designate a roadway as operating acceptably or unacceptable, this evaluation provides a good indication of a project's contribution to an acceptable or unacceptable level of growth on the roadway. The study roadway segments are shown in Figure 7.

Three of the study roadway segments (Jefferson Drive, Chrysler Drive west of Constitution Drive, and Independence Drive) are classified as local streets in the City's *Circulation* report of the General Plan Update. Local streets have lower traffic thresholds that are more typical of residential areas, intended to preserve the quality of life of residents. Nevertheless, the local street traffic volume capacity was applied to these three roadway segments, located in an industrial area, resulting in a conservative analysis of the segments.

Existing traffic volumes for all study roadway segments, with the exception of two segments, were obtained from the *Circulation* report. Traffic volumes for the segments of #1 Jefferson Drive, south of Chrysler Drive and #4 Independence Drive, north of Chrysler Drive, were obtained from the *Commonwealth Corporate Center* Draft Environmental Impact Report, February 2014, since these count locations were not included in the City's report.

The results of the analysis show that all study roadway segments, with the exception of the segment of Chrysler Drive, west of Constitution Drive, currently carry traffic volumes that fall within their acceptable capacities. The segment of Chrysler Drive, west of Constitution Drive, currently carries traffic volumes that are higher than the designated capacity for a local street.

The segment of Chilco Street, between Constitution Drive and Bayfront Expressway, currently carries the most traffic out of all the study roadway segments but continues to be well within the designated capacity for this segment.

The results of the roadway segment analysis are summarized in Table 7.

Table 6
Existing Intersection Levels of Service

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Existing Delay [1]	Existing LOS [2]
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches) /CMP	D	AM	**541.3** [3]	**F**
	SB Critical Delay					***79.8***	***E***
	WB Critical Delay					*53.9*	*D*
					PM	**759.5** [3]	**F**
	SB Critical Delay					***58.3***	***E***
	WB Critical Delay					***64.9***	***E***
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	C	AM	22.3	C
					PM	10.6	B
3	US-101 NB Ramps and Marsh Road	Signal	State	D	AM	20.1	C
					PM	52.5	D
4	US-101 SB Ramps and Marsh Road	Signal	State	D	AM	53.4	D
					PM	25.5	C
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local approaches)	D	AM	11.2	B
					PM	20.1	C
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	C	AM	8.8	A
					PM	14.4	B
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	9.8	A
					PM	9.9	A
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	9.4	A
					PM	9.6	A
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	C	AM	9.2	A
					PM	13.6	B
10	Bayfront Expressway and Chilco Street	Signal	State (with local approaches)	D	AM	16.3	B
					PM	28.8	C
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	C	AM	11.6	B
					PM	23.6	C

Notes:

[1] Delay = average seconds of delay per vehicle for all vehicles at signalized and 4-way stop-controlled intersections, and average worst approach delay for vehicles at 2-way/1-way stop-controlled intersections.

[2] LOS = level of service for the entire intersection at signalized and 4-way stop-controlled intersections, and for the worst approach at 2-way/1-way stop-controlled intersections.

[3] The HCM methodology for intersection analysis does not accurately calculate actual intersection operating conditions once the calculated intersection delay exceeds 100+ seconds. Once an intersection is calculated to operate with delays exceeding 100 seconds, any additional traffic to the intersection will increase the intersection delay exponentially, resulting in unrealistic excessive delays that most likely would never be experienced at an actual intersection. However, for the purpose of quantifying the projected increase in delay due to the proposed project, all calculated delays are reported, including those exceeding 100 seconds.

Entries denoted in **bold** indicate conditions that exceed the City's (and/or Caltrans for the applicable intersections) current level of service standard.

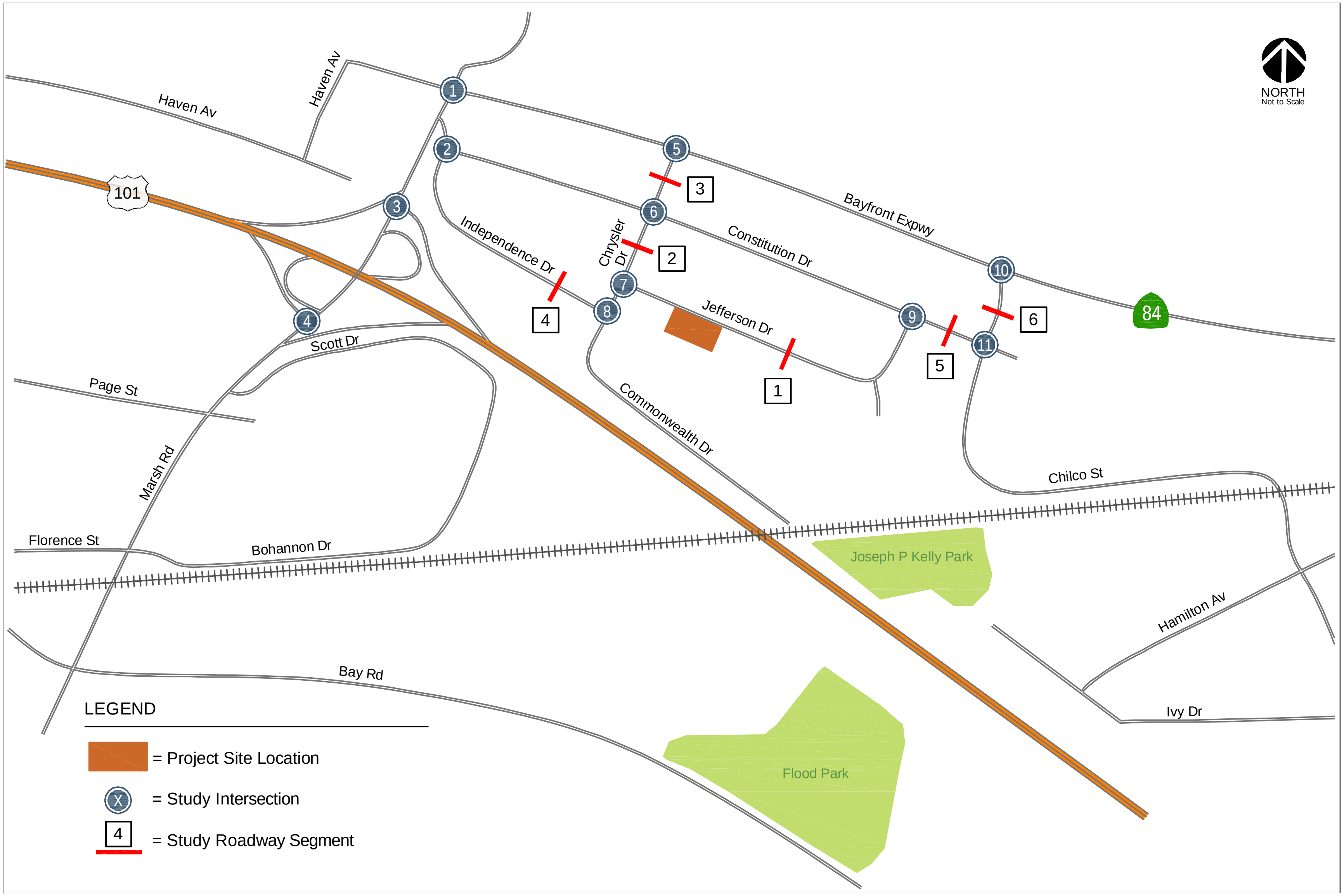

Figure 7
Study Roadway Segments

Table 7
Existing Roadway Segment Analysis Results

	Roadway Segment	Classification	Capacity	Existing ADT
1	Jefferson Drive, south of Chrysler Drive [1]	Local	1,500	1,290
2	Chrysler Drive, between Jefferson Drive and Constitution Drive	Local	1,500	**3,300**
3	Chrysler Drive, between Constitution Drive and Bayfront Expressway	Collector	10,000	4,000
4	Independence Drive, north of Chrysler Drive [1]	Local	1,500	1,020
5	Constitution Drive, between Jefferson Drive and Chilco Street	Collector	10,000	2,400
6	Chilco Street, between Constitution Drive and Bayfront Expressway	Collector	10,000	7,000

Notes:
ADT = Average Daily Traffic
Roadway segment classification, capacity, and existing ADT information obtained from the *Circulation Existing Conditions* Report (City of Menlo Park General Plan), January 2015, with the exception of segments #1 and #4.
[1] Existing ADT for segments #1 and #4 obtained from the *Commonwealth Corporate Center Project* Draft Environmental Impact Report, February 2014.
Bold indicates ADT values that exceed the acceptable capacity.

Existing Routes of Regional Significance Analysis

The CMP *Land Use Analysis Program* guidelines require that Routes of Regional Significance be evaluated to determine the impact of the additional traffic projected to be generated by new projects adding 100 or more peak hour trips to the CMP roadway network.

Three routes of regional significance segments (or a total of six directional segments) were evaluated: one along Bayfront Expressway and two along US 101. These are the regional routes that would be most affected by the proposed school traffic. According to the 2015 CMP Monitoring Report, the study freeway segments on US 101 have a level of service standard of LOS F while SR 84 has a level of service standard of LOS D. Existing traffic volumes for the study segments were obtained from Caltrans and consist of 2015 counts.

The results of the analysis shows that all directional roadway segments analyzed currently operate within the segments' level of service standard.

The results of the routes of regional significance analysis are summarized in Table 8.

Existing Freeway Ramp Analysis

A freeway ramp analysis was conducted for the US 101 interchange at Marsh Road. This is the primary freeway interchange that currently serves the project site. The analysis is based on calculated volume-to-capacity (V/C) ratios at the study freeway ramps. Existing peak-hour ramp volumes were obtained from Caltrans and consist of 2015 freeway ramp counts. The ramp capacities are discussed below.

Existing Freeway Ramp Configurations and Capacities

The study US 101 at Marsh Road interchange consists of partial cloverleaf interchange. The proposed project would add traffic to the following ramps of the interchange:

Table 8
Existing Routes of Regional Significance Analysis Results

Route	Segment	Direction	LOS Standard [1]	Capacity [2]	Peak Hour	Existing Volume [3]	Existing V/C	Existing LOS
US 101	North of Marsh Road	NB	F	9,200	AM	6,964	0.757	D
				9,200	PM	6,642	0.722	D
	North of Marsh Road	SB	F	9,200	AM	8,378	0.911	E
				9,200	PM	7,962	0.865	E
US 101	South of Marsh Road	NB	F	9,200	AM	6,386	0.694	D
				9,200	PM	6,091	0.662	C
	South of Marsh Road	SB	F	9,200	AM	7,683	0.835	D
				9,200	PM	7,302	0.794	D
Bayfront Expressway (SR 84)	from Willow Road (SR 114) to US 101	NB	D	3,300	AM	2,779	0.842	D
				3,300	PM	1,489	0.451	A
	from US 101 to Willow Road (SR 114)	SB	D	3,300	AM	1,773	0.537	A
				3,300	PM	2,543	0.771	C

Notes:
V/C = Volume to Capacity Ratio; LOS = Level of Service.
[1] Level of service standards as defined in the C/CAG *LOS and Performance Measure Monitoring Report*, 2015.
[2] The *Highway Capacity Manual* identifies capacity values for freeway segments with six or more lanes as 2,300 vehicles per hour per lane (vphpl); the capacity for four-lane freeway segments is identified as 2,200 vphpl.
Arterial capacity is estimated to be 1,100 vphpl, based on a saturation flow rate of 1,900 vphpl and assuming the arterial facility receives 60 percent of the green time.
[3] Existing volumes obtained from Caltrans and consist of 2015 counts.

- US 101 northbound off-ramp to Marsh Road
- US 101 northbound on-ramp from westbound Marsh Road
- US 101 southbound off-ramp to Marsh Road
- US 101 southbound on-ramp from westbound Marsh Road

For this ramp analysis, the ramp capacity for the off-ramps is dictated by the number of lanes at the ramps' diverging point from the freeway mainline, or the constraint point, since this is the location on the ramp that dictates how much traffic exits the freeway. The operations of the portion of the ramp that widens at the off-ramp intersection are reflected in the intersection level of service analysis.

The study on-ramps are controlled by a ramp meter during the peak hours. For metered on-ramps, the constraint point is at the meter.

Typical capacity for a diagonal freeway ramp ranges between 1,800 and 2,200 vehicles per hour per lane (vphpl). Therefore, a capacity of 2,000 vphpl was assumed for the study diagonal non-metered ramps.

For metered on-ramps, the capacity depends on the ramp meter rate. Based on previous correspondence with Caltrans, it was determined that 4.0 seconds per vehicle (sec/veh) is the maximum meter rate output for Caltrans District 4, with typical meter rates of 4.5 to 4.0 sec/veh, or approximately 820 to 900 vehicles per hour (vph), for each the HOV lanes and mixed-flow lanes, regardless of the number of lanes. Therefore, for the purpose of this analysis, the metered on-ramps were assumed to have a capacity of 900 vph for each the mixed-flow and HOV traffic lanes.

Based on the above capacities, the study freeway ramps' configurations and capacities are as follows:

- US 101 northbound off-ramp to Marsh Road (diagonal ramp) – this ramp consists of one lane where it diverges from the freeway mainline, for a total capacity of 2,000 vph.

- US 101 northbound on-ramp from westbound Marsh Road (diagonal ramp) – this ramp is controlled by a ramp meter and consists of two mixed-flow lanes and one HOV lane up to the meter and narrows down to a single lane after the meter to the freeway merging point. The capacity of the ramp is assumed to be 900 vph for each the HOV and mixed-flow lanes.

- US 101 southbound off-ramp to Marsh Road (diagonal ramp) – this ramp consists of two lanes where it diverges from the freeway mainline, for a total capacity of 4,000 vph.
- US 101 southbound on-ramp from westbound Marsh Road (loop ramp) – this ramp is controlled by a ramp meter and consists of a single lane, for a total ramp capacity of 900 vph.

Freeway Ramp Analysis Procedure

The following characteristics and assumptions were applied to calculate the V/C ratios for the off-ramps:

- The study off-ramps have the capacity of one and two lanes at their constraint point, even though portions of the ramps have three lanes.
- The ramp's constraint point must serve all vehicles within the ramp exiting the freeway.
- The V/C ratio for the off-ramps, therefore, was calculated based on the total volume on the ramp divided by the ramp's capacity at the constraint point.

For the metered on-ramps, the following characteristics and assumptions were applied to calculate the V/C ratios:

- For the on-ramp with mixed-flow and HOV lanes, the percentage of HOV traffic was assumed to be 25 and 30 percent of the total peak-hour volume during the AM and PM peak hours, respectively. This assumption was made based on the percentage of HOV traffic on the freeway mainline at the freeway segment of US 101 south of Embarcadero Road, in Palo Alto, obtained from the 2014 Santa Clara County CMP Annual Monitoring Report. This segment is approximately 4 miles south of the study interchange at Marsh Road.
- It was estimated that the existing HOV traffic volume on the metered northbound on-ramp is well below the HOV capacity of the ramp and could be easily served by the on-ramp during the peak hours. Therefore, it was concluded that the HOV lane on the northbound on-ramp currently operates at acceptable levels and the analysis of this ramp corresponds to the mixed-flow lanes only (mixed-flow traffic volumes and mixed-flow lanes capacity).

Existing Freeway Ramp Analysis Results

Table 9 shows the existing ramp volumes and levels of service during the peak hours.

Based on the calculated V/C ratios, the following freeway ramp was found to currently operate at substandard levels, based on Caltrans standards:

Northbound on-ramp from westbound Marsh Road (LOS F – AM, LOS D – PM peak hours)

The remainder of the study interchange ramps currently operate at acceptable levels.

Table 9
Existing Freeway Ramp Analysis Results

Interchange/Ramp	Ramp Type	Existing Control Type	Peak Hour	Existing Number of Lanes: Mixed-flow	Existing Number of Lanes: HOV	Existing Number of Lanes: Constraint Point[1]	Ramp Capacity (vph)[2]	Existing Conditions: Total Volume[3]	Existing Conditions: Mixed-flow Volume (vph)	Existing Conditions: HOV Volume (vph)[4]	Existing Conditions: V/C [5]	Existing Conditions: LOS [5]
US 101 at Marsh Road												
NB off-ramp to Marsh Rd	Diagonal	Signal	AM	3	0	1	2,000	1,008	1,008	N/A	0.504	A
		Signal	PM			1	2,000	882	882	N/A	0.441	A
NB on-ramp from WB Marsh Rd	Diagonal	Meter	AM	2	1	1	**900**	**2,184**	**1,638**	**546**	**1.820**	**F**
		Meter	PM			1	**900**	**1,098**	**769**	**329**	**0.854**	**D**
SB off-ramp to Marsh Rd	Diagonal	Signal	AM	3	0	2	4,000	1,524	1,524	N/A	0.381	A
		Signal	PM			2	4,000	1,549	1,549	N/A	0.387	A
SB on-ramp from WB Marsh Rd	Loop	Meter	AM	1	0	1	900	200	200	N/A	0.222	A
		Meter	PM			1	900	285	285	N/A	0.317	A

Notes:

[1] The constraint point of a ramp is the location on the ramp that dictates how much traffic enters/exits the freeway. The constraint point determines the ramp's capacity.
For freeway off-ramps, the constraint point is at the ramp's diverging point from the freeway mainline.
For non-metered on-ramps, the constraint point is at the ramp's merging point with the freeway.
For metered on-ramps, the constraint point is at the meter.

[2] Typical capacity for diagonal ramps is 2,000 vehicles per hour per lane (vphpl).
The capacity for non-metered ramps is determined based on the number of lanes at the ramp's constraint point.
The capacity for metered on-ramps was assumed to be 900 vphpl for mixed-flow lane ramps, regardless of the number of lanes.
At ramps that include HOV lanes, the analysis is based on the mixed-flow lane(s) ONLY.

[3] Existing ramp count data provided by Caltrans and consists of 2015 counts.

[4] HOV traffic volumes at the northbound on-ramp from westbound Marsh Road was assumed to be 25% and 30% of total traffic volume during the AM and PM peak hour, respectively, based on the percentage of HOV traffic on the freeway mainline.

[5] The calculated volume-to-capacity (V/C) ratio at the northbound on-ramp from westbound Marsh Road corresponds to the mixed-flow traffic volumes and capacity ONLY (the HOV lane is projected to operate adequately).
The ramp level of service corresponds to the calculated ramp V/C ratios.

Bold indicates substandard level of service conditions, based on Caltrans level of service standard of LOS C or better.

3.
Existing Plus Project Conditions

This chapter describes existing traffic conditions with the addition of the traffic that would be generated by the proposed project. Existing plus project traffic conditions could potentially exist if the project was constructed and occupied prior to the other approved projects in the area. It is unlikely that this traffic condition would occur, since other approved projects expected to add traffic to the study area would likely be built and occupied during the time the project is going through the development review and construction process. This scenario describes a less congested traffic condition, since it ignores any potential traffic from prior approvals.

Transportation Network under Existing Plus Project Conditions

No off-site transportation improvements are planned by the project. Therefore, it is assumed in this analysis that the transportation network under existing plus project conditions is the same as the existing transportation network.

Project Description

The proposed new high school would be part of the Sequoia Union High School District (SUHSD). The project site is located at 150 Jefferson Drive and consists of an approximately 2.1-acre site within an area in Menlo Park that is transitioning from industrial/warehouse land uses to newer corporate campuses and mixed biotechnology, commercial, and office uses.

Currently, an approximately 44,000 square-foot building occupies the site and serves as the corporate headquarters and sales office for Bay Associates Wireless Technologies, a cable and cable assemblies business. The existing facilities on site are proposed to be demolished and replaced with a new school campus. The new school, as proposed, would serve up to 400 students in the grades 9 through 12 with 35 faculty/staff members, and would consist of an approximately 40,000 square-foot three-story building. The school is planned to be in session from 8:15-8:30 AM to 3:30-3:45 PM during the traditional school year, with summer school offerings as well.

The proposed school is intended to alleviate increases in the SUHSD's existing and projected student enrollment, and therefore, would be open to all SUHSD students. However, the SUHSD anticipates the school would primarily serve students from the southern part of the SUHSD (Redwood City, Menlo Park, and East Palo Alto). Menlo Park's Belle Haven neighborhood is approximately less than half a mile southeast of the project site (across the Dumbarton rail corridor) and the City's Suburban Park/Lorelei Manor/Flood Park neighborhood is approximately 0.2 miles south of the site (across US 101). It was projected that approximately 10 percent (%) of the students of the new school would come from these two neighborhoods (this is discussed in more detail in the following sections).

Construction of the proposed school is anticipated to begin in the first quarter of 2017, with the target date of August 2018 for opening the new school. The first year (2018-2019 school year), the school is anticipated to serve a maximum of 100 freshman students, increasing its size by 100 new freshman students each year thereafter until the maximum student enrollment of 400 students (2021-2022 school year) is reached.

Additionally, the SUHSD may enter into a partnership with the San Mateo County Community College District (SMCCCD) to provide content-specific high school courses as well as provide community college courses at the school campus several nights a week. If the SUHSD and SMCCCD decide to offer community college classes at the proposed Menlo Park Small High School campus, they would be no more than four night classes with start times after 7:00 PM.

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear are estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic entering and exiting the site is estimated for the peak hours. As part of the project trip distribution step, an estimate is made of the directions to and from which the project trips would travel. In the project trip assignment step, the project trips are assigned to specific streets and intersections in the study area. These procedures are described further in the following sections.

Trip Generation

Through empirical research, data have been collected that correlate to common land uses their propensity for producing traffic. Thus, for the most common land uses there are standard trip generation rates that can be applied to help predict the future traffic increases that would result from a new development. Trip generation rates for common land uses are contained in the Institute of Transportation Engineers' (ITE's) *Trip Generation Manual*, 9th Edition, 2012. The trip generation resulting from new development, therefore, typically is estimated by multiplying the ITE trip generation rates by the size of the development. However, since the ITE Trip Generation Manual does not have trip generation rates that would truly represent the proposed project (a small high school) or are specific to the project area, the trips generated by the proposed school were estimated based on trip generation counts conducted at Everest High School.

Everest High School is an existing SUHSD small high school with similar characteristics to the proposed school project, including the school's maximum capacity of 400 students and the general service area. Everest High School is located at 445 5th Avenue, in the City of Redwood City, less than 3 miles (driving distance) from the proposed project site. Trip generation counts were conducted at the Everest school site on April 9th, 2015, between the hours of 7:30 to 8:30 AM and 3:00 to 4:00 PM, during the start time and dismissal time, respectively, for the high school. The trip generation counts showed that at the beginning of the school day, the peak-hour trip generation rate for Everest High School was estimated to be 0.88 trips per student while the peak-hour trip generation rate during school dismissal was estimated to be 0.51 trips per student.

For comparison purpose, ITE trip generation rates for high school (land use code 530) were compared to the surveyed rates. The surveyed trip generation rates are higher than ITE rates (0.43 and 0.29 AM and afternoon school peak hours, respectively), providing for a more conservative analysis of the proposed project.

The surveyed trip generation rates and comparison with ITE rates are summarized in Table 10 below.

Table 10
Everest High School Trip Generation Counts Summary

			AM Peak Hour						PM Peak Hour					
			Pk-Hr	Splits		Trips			Pk-Hr	Splits		Trips		
Land Use	Size		Factor	In	Out	In	Out	Total	Factor	In	Out	In	Out	Total
Everest High School	391	students	0.88	57%	43%	197	149	346	0.51	44%	56%	88	113	201
High School (ITE)[1]	400	students	0.43	68%	32%	117	55	172	0.29	33%	67%	38	78	116

Source: Trip generation counts conducted at Everest High School (445 5th Avenue, Redwood City) on April 9th, 2015, during the school's start and dismissal times.
391 was the student enrollment at the time the trip generation counts were conducted.
[1] For comparison purposes, trip generation estimated based on average trip generation rates for high school (land use code 530) contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual* , 9th Edition, 2012.

Existing Use On Site

Trips generated by the existing building on site were estimated by applying the ITE trip generation rates for manufacturing land use (ITE land use code 140) to the size of the building. Based on ITE trip generation rates, the existing building on site is estimated to generate 32 trips during the AM peak-hour (25 inbound and 7 outbound trips) and 32 trips during the PM peak-hour (12 inbound and 20 outbound trips).

Proposed School Project

The magnitude of traffic added to the roadway system by the proposed project was estimated by multiplying the proposed number of student by the surveyed Everest High School trip generation rates. Based on the surveyed rates, it is estimated that the proposed 400-student school would generate a total of approximately 354 trips (202 inbound and 152 outbound) during the AM peak hour and 206 trips (91 inbound and 115 outbound) during the PM peak hour. This represents the peak-hour traffic projected to be generated by the proposed project (gross project trips) at the school's full capacity.

Since the project site is currently occupied, traffic generated by the existing building on site is included in the existing traffic counts. Once the proposed project is built, existing site traffic would no longer be on the roadway network. For this reason, credit for the existing site-generated traffic is given to the site and the total net project trips that would be added to the roadway network by the proposed school are estimated by subtracting the site's existing trip credit from the estimated school traffic (gross project trips). After reduction of the existing site trips, the proposed 400-student school project is estimated to generate a net total of 322 AM peak hour trips (177 inbound and 145 outbound) and 174 PM peak hour trips (79 inbound and 95 outbound).

The trip generation estimates are presented in Table 11.

Table 11
Proposed School Trip Generation Estimates - 400-Student School

			AM Peak Hour						PM Peak Hour					
			Pk-Hr	Splits		Trips			Pk-Hr	Splits		Trips		
Land Use	Size		Factor	In	Out	In	Out	Total	Factor	In	Out	In	Out	Total
Existing Land Use[1]														
Bay Associate	44,000	s.f.	0.73	78%	22%	25	7	32	0.73	36%	64%	12	20	32
Proposed Project[2]														
High School	400	students	0.88	57%	43%	202	152	354	0.51	44%	56%	91	115	206
Net Project Trips (400-student school)						**177**	**145**	**322**				**79**	**95**	**174**

Notes:
[1] Trip generation estimates for the existing use on site are based on average trip generation rates for manufacturing land use (land use code 140) contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual* , 9th Edition, 2012.
[2] Trip generation estimates for the proposed school project are based on trip generation counts conducted at Everest High School on April 9, 2015.

Trip Distribution

The trip distribution pattern for the proposed school was estimated based on information provided by the school on the anticipated service areas, on information on the existing service areas for Everest High School, and on existing travel patterns and the location of complementary land uses in the project area. The trip distribution patterns for the proposed project are illustrated on Figure 8.

Trip Assignment

The peak hour trips generated by the proposed development were assigned to the roadway system in accordance with the trip distribution patterns discussed above.

The assignment assumes that all project traffic represents new trips on the roadway network. However, this is not entirely true. The new school would not result in enrollment growth in the SUHSD but would serve the existing demand. Presumably, all students that would be attending the new school represent students who currently attend other SUHSD schools. Whether by bus or passenger vehicle, these student trips are on the roadway network today. Providing a new high school would result in shorter diverted existing student trips. Additionally, it can be expected that a large percentage of students being dropped-off at the school would be dropped-off by a parent/family member on their way to work. These trips would not be entirely new trips but existing trips on the roadway network that would detour to the school site and proceed back to their normal direction of travel and on to their final destination. Detoured trips would show up as new trips only at intersections off their normal direction of travel, most likely intersections in the immediate vicinity of the project site. Assuming all school trips are new trips may result in double counting existing trips already on the roadway network (and included in the existing traffic counts). However, since there is not sufficient information available to determine the current travel path or travel mode choice of the anticipated student population, it is not possible to quantify the existing school traffic originating from the area and traveling to schools outside the area. For this reason, it is conservatively assumed in the analysis of the project that all project traffic represents new trips at all study intersections.

Additionally, traffic associated with the existing building on site was assigned to the roadway network as negative trips, representing the elimination of these trips from the roadway network. Thus, with the addition of the traffic projected to be generated by the proposed school project (gross project trips) to the roadway network and the elimination of the trips associated with the existing building (negative trips), the total traffic assignment represents the net site generated traffic.

The net project trip assignment at the study intersections is shown graphically on Figure 9.

Existing Plus Project Traffic Volumes

The project trips, as represented in the project trip assignment discussed above, were added to existing traffic volumes to obtain existing plus project traffic volumes. The existing plus project traffic volumes are presented on Figure 10. Traffic volumes for all components of traffic are tabulated in Appendix A.

Projected peak-hour project trips also were added to the existing volumes at the study Routes of Regional Significance segments and freeway interchange ramps for the analysis of those facilities. Daily project traffic volumes for the analysis of the roadway segments were estimated by adding the AM and PM peak-hour project trips and increasing them by 10%. The 10% increase in project traffic represents all traffic generated by the proposed school during the off-peak hours.

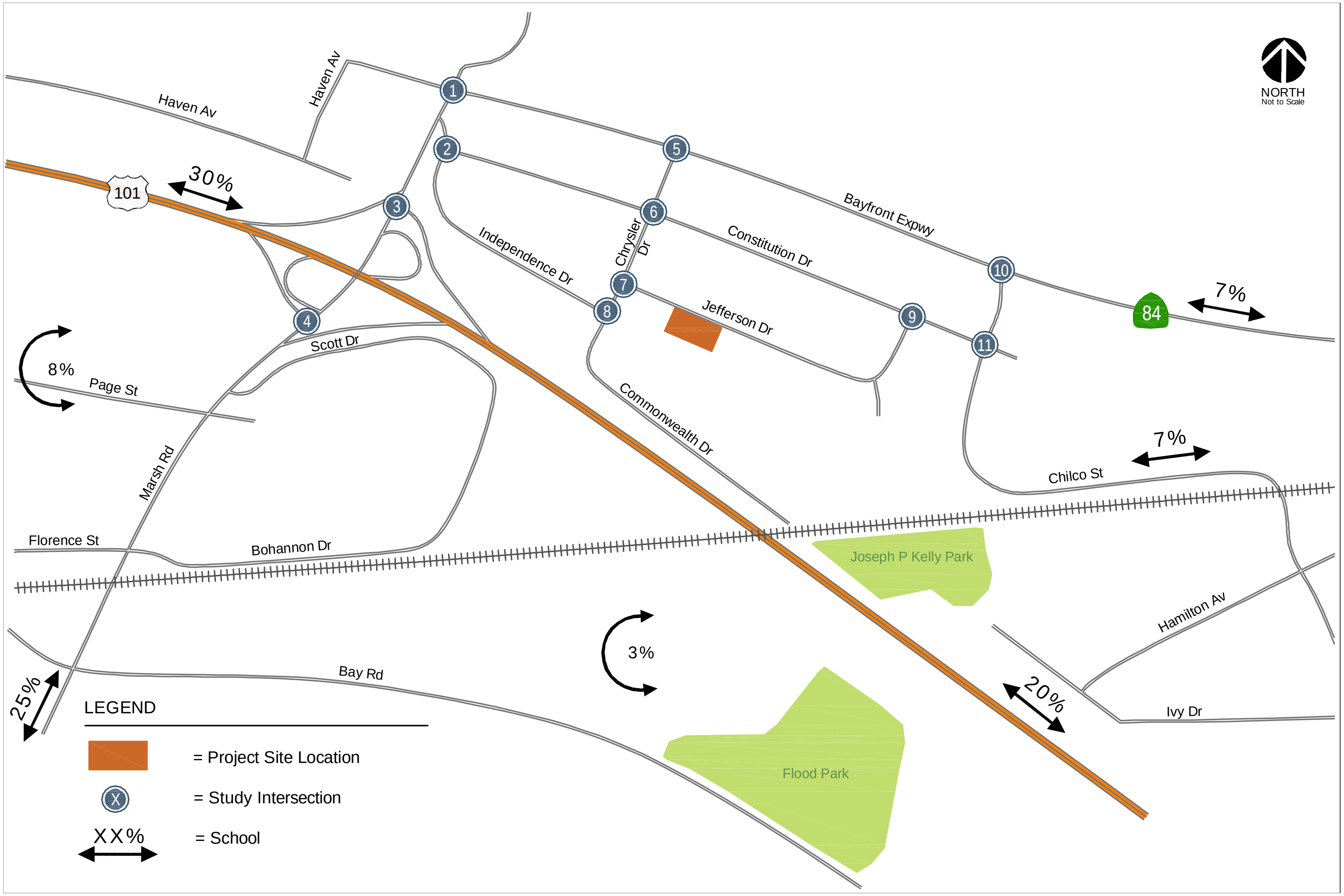

Figure 8
Project Trip Distribution

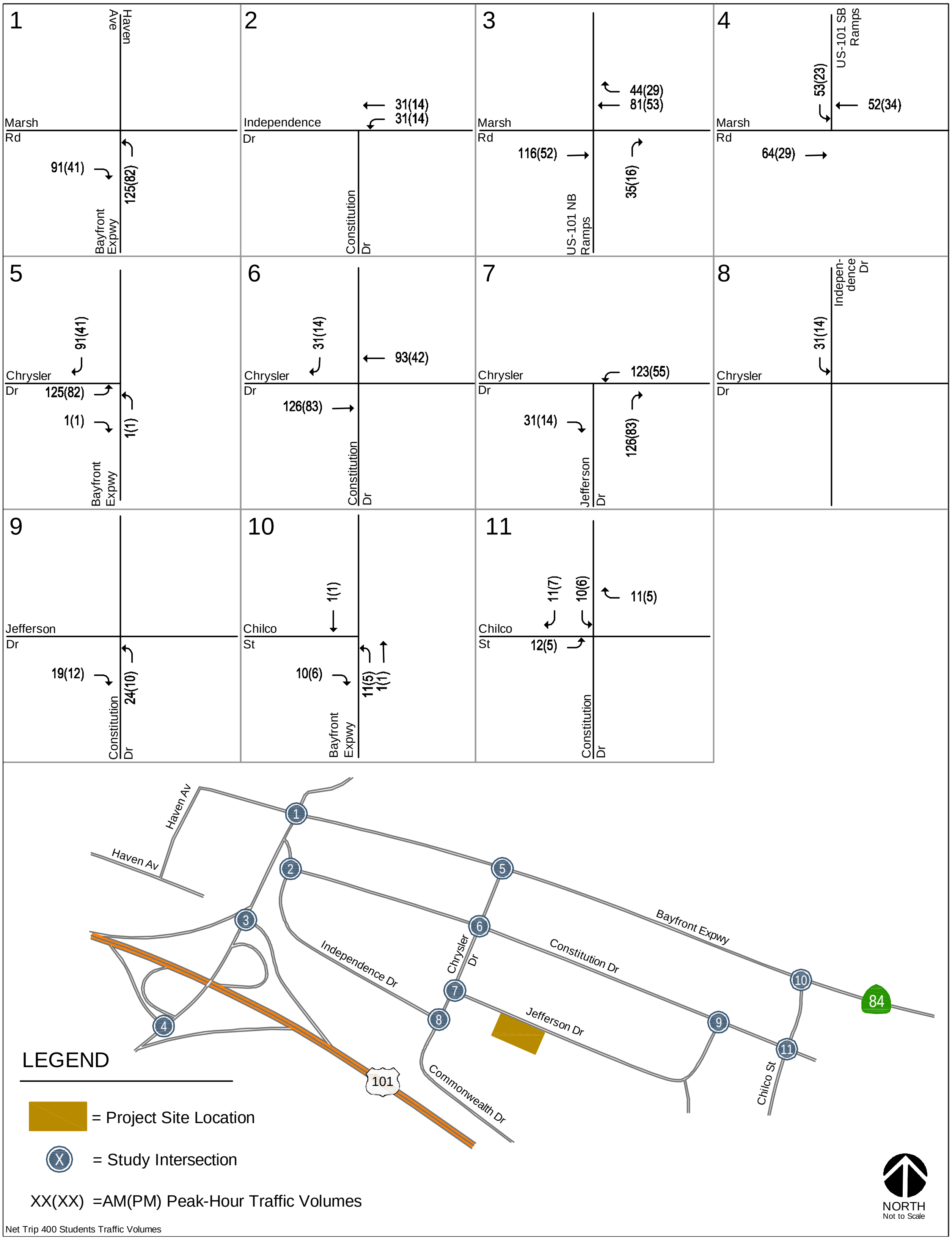

Figure 9
Net Project Trip Assignment (400-Student School)

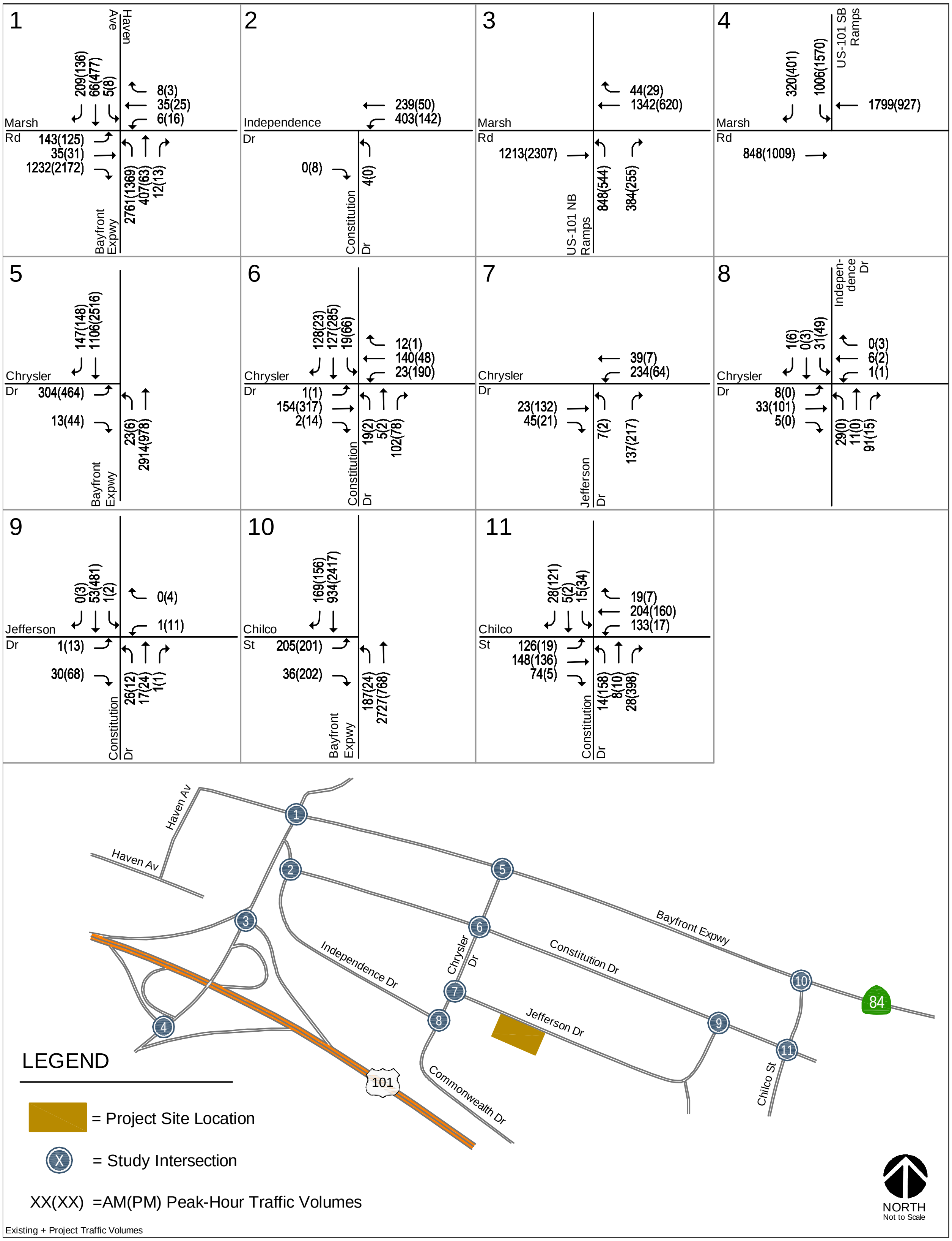

Figure 10
Existing Plus Project Traffic Volumes

Intersection Levels of Service Under Existing Plus Project Conditions

Intersection levels of service were evaluated against City of Menlo Park and Caltrans standards. The results of the intersection level of service analysis under existing plus project conditions are summarized in Table 12.

City of Menlo Park Intersections

The results of the level of service analysis show that, measured against the City of Menlo Park level of service policy, the following study intersections are projected to operate at unacceptable levels of service during at least one of the peak hours under existing plus project conditions:

1. Bayfront Expressway and Marsh Road - (LOS F – AM & PM peak hours)
2. Constitution Drive and Independence Drive - (LOS D - AM peak hour)
3. US 101 Northbound Ramps and Marsh Road – (LOS E – PM peak hour)
4. US 101 Southbound Ramps and Marsh Road - (LOS E - AM peak hour)
11. Constitution Drive and Chilco Street – (LOS D – PM peak hour)

The remainder of the study intersections are projected to operate at acceptable levels of service during both the AM and PM peak hours under existing plus project conditions.

Caltrans Intersections

The results of the level of service analysis show that, measured against LOS D standard, the following Caltrans intersections are projected to operate at unacceptable levels of service during at least one of the peak hours analyzed:

1. Bayfront Expressway and Marsh Road - (LOS F – AM & PM peak hours)
3. US 101 Northbound Ramps and Marsh Road – (LOS E – PM peak hour)
4. US 101 Southbound Ramps and Marsh Road - (LOS E, AM peak hour)

The remainder of the Caltrans study intersections are shown to currently operate at acceptable levels of service during both the AM and PM peak hours. The intersection level of service calculation sheets are included in Appendix B.

Existing Plus Project Roadway Segment Analysis

The results of the roadway segment analysis under existing plus project conditions are summarized in Table 13. The results of the analysis show that the following roadway segments are projected to have traffic volumes that exceed their acceptable capacity:

1. Jefferson Drive, south of Chrysler Drive
2. Chrysler Drive, between Jefferson Drive and Constitution Drive

It should be noted that both of the study roadway segments listed above are classified as local streets. Local streets tend to have lower traffic thresholds that are more typical of residential areas. If the designated capacity for collector streets was assumed for these segments, even with the addition of project traffic, traffic volumes on both Jefferson and Chrysler Drives would be well within the acceptable segments' capacity. The evaluation of Jefferson Drive and Chrysler Drive, between Jefferson Drive and Constitution Drive (as well as Independence Drive), therefore, represents a conservative analysis.

The roadway segment of Chrysler Drive, between Constitution Drive and Bayfront Expressway, is projected to carry the most traffic out of all the study roadway segments under existing plus project conditions.

Table 12
Existing Plus Project Intersection Levels of Service

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Existing Delay [1]	Existing LOS [2]	Existing plus Project (400 students) Delay [1]	Existing plus Project (400 students) LOS [2]
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches)/ CMP	D	AM	**541.3** [3]	**F**	**611.1** [3]	**F**
	SB Critical Delay					***79.8***	***E***	***79.8***	***E***
	WB Critical Delay					*53.9*	*D*	*53.9*	*D*
					PM	**759.5** [3]	**F**	**771.4** [3]	**F**
	SB Critical Delay					***58.3***	***E***	***58.3***	***E***
	WB Critical Delay					***64.9***	***E***	***64.9***	***E***
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	C	AM	22.3	C	**25.4**	**D**
					PM	10.6	B	11.0	B
3	US-101 NB Ramps and Marsh Road	Signal	State	D	AM	20.1	C	21.4	C
					PM	52.5	D	**58.5**	**E**
4	US-101 SB Ramps and Marsh Road	Signal	State	D	AM	53.4	D	**59.8**	**E**
					PM	25.5	C	26.6	C
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local	D	AM	11.2	B	12.8	B
					PM	20.1	C	20.7	C
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	C	AM	8.8	A	10.9	B
					PM	14.4	B	18.8	C
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	9.8	A	10.2	B
					PM	9.9	A	10.7	B
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	9.4	A	10.1	B
					PM	9.6	A	9.7	A
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	C	AM	9.2	A	9.9	A
					PM	13.6	B	14.3	B
10	Bayfront Expressway and Chilco Street	Signal	State (with local	D	AM	16.3	B	16.6	B
					PM	28.8	C	29.0	C
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	C	AM	11.6	B	12.2	B
					PM	23.6	C	**25.0**	**D**

Notes:
[1] Delay = average seconds of delay per vehicle for all vehicles at signalized and 4-way stop-controlled intersections, and average worst approach delay for vehicles at 2-way/1-way stop-controlled intersections.
[2] LOS = level of service for the entire intersection at signalized and 4-way stop-controlled intersections, and for the worst approach at 2-way/1-way stop-controlled intersections.
[3] The HCM methodology for intersection analysis does not accurately calculate actual intersection operating conditions once the calculated intersection delay exceeds 100+ seconds. Once an intersection is calculated to operate with delays exceeding 100 seconds, any additional traffic to the intersection will increase the intersection delay exponentially, resulting in unrealistic excessive delays that most likely would never be experienced at an actual intersection. However, for the purpose of quantifying the projected increase in delay due to the proposed project, all calculated delays are reported, including those exceeding 100 seconds.
Entries denoted in **bold** indicate conditions that exceed the City's (and/or Caltrans for the applicable intersections) current level of service standard.

Table 13
Existing Plus Project Roadway Segment Analysis Results

	Roadway Segment	Classification	Capacity	Existing ADT	ADT Project Trips	ADT Existing Plus Project
1	Jefferson Drive, south of Chrysler Drive [1]	Local	1,500	1,290	**388**	**1,678**
2	Chrysler Drive, between Jefferson Drive and Constitution Drive	Local	1,500	**3,300**	**350**	**3,650**
3	Chrysler Drive, between Constitution Drive and Bayfront Expressway	Collector	10,000	4,000	311	4,311
4	Independence Drive, north of Chrysler Drive [1]	Local	1,500	1,020	39	1,059
5	Constitution Drive, between Jefferson Drive and Chilco Street	Collector	10,000	2,400	60	2,460
6	Chilco Street, between Constitution Drive and Bayfront Expressway	Collector	10,000	7,000	28	7,028

Notes:
ADT = Average Daily Traffic
Roadway segment classification, capacity, and existing ADT information obtained from the *Circulation Existing Conditions* Report (City of Menlo Park General Plan), January 2015, with the exception of segments #1 and #4.
[1] Existing ADT for segments #1 and #4 obtained from the *Commonwealth Corporate Center Project* Draft Environmental Impact Report, February 2014.
Bold indicates ADT values that exceed the acceptable capacity.

Existing Plus Project Routes of Regional Significance Analysis

The results of the routes of regional significance analysis under existing plus project conditions are summarized in Table 14. The results of the analysis shows that, with the addition of project traffic to the study roadway segments, all study roadway segments are projected to operate within the segments' level of service standard under existing plus project conditions.

Existing Plus Project Freeway Ramp Analysis

Table 15 shows the projected ramp volumes and levels of service during the peak hours under existing plus project conditions.

Based on the calculated V/C ratios, the following freeway ramp is projected to operate at substandard levels, based on Caltrans standards:

Northbound on-ramp from westbound Marsh Road (LOS F – AM, LOS D – PM peak hours)

The remainder of the study interchange ramps are projected to operate at acceptable levels.

Table 14
Existing Plus Project Routes of Regional Significance Analysis Results

							Existing Plus Project			
Route	Segment	Direction	LOS Standard[1]	Capacity[2]	Peak Hour	Existing Volume[3]	Net Project Trips	Total Volume	V/C	LOS
US 101	North of Marsh Road	NB	F	9,200	AM	6,964	44	7,008	0.762	D
				9,200	PM	6,642	29	6,671	0.725	D
	North of Marsh Road	SB	F	9,200	AM	8,378	53	8,431	0.916	E
				9,200	PM	7,962	24	7,986	0.868	E
US 101	South of Marsh Road	NB	F	9,200	AM	6,386	35	6,421	0.698	D
				9,200	PM	6,091	16	6,107	0.664	C
	South of Marsh Road	SB	F	9,200	AM	7,683	29	7,712	0.838	D
				9,200	PM	7,302	19	7,321	0.796	D
Bayfront Expressway (SR 84)	from Willow Road (SR 114) to US 101	NB	D	3,300	AM	2,779	125	2,904	0.880	D
				3,300	PM	1,489	82	1,571	0.476	A
	from US 101 to Willow Road (SR 114)	SB	D	3,300	AM	1,773	91	1,864	0.565	A
				3,300	PM	2,543	41	2,584	0.783	C

Notes:
V/C = Volume to Capacity Ratio; LOS = Level of Service.
[1] Level of service standards as defined in the C/CAG *LOS and Performance Measure Monitoring Report*, 2015.
[2] The *Highway Capacity Manual* identifies capacity values for freeway segments with six or more lanes as 2,300 vehicles per hour per lane (vphpl); the capacity for four-lane freeway segments is identified as 2,200 vphpl.
Arterial capacity is estimated to be 1,100 vphpl, based on a saturation flow rate of 1,900 vphpl and assuming the arterial facility receives 60 percent of the green time.
[3] Existing volumes obtained from Caltrans and consist of 2015 counts.

Table 15
Existing Plus Project Freeway Ramp Analysis Results

					Existing Conditions					Existing Plus Project Conditions					
Interchange/Ramp	Ramp Type	Existing Control Type	Peak Hour	Ramp Capacity (vph)[1]	Total Volume[2]	Mixed-flow Volume (vph)	HOV Volume (vph)[3]	V/C [4]	LOS [4]	Total Volume	Project Trips	Mixed-flow Volume (vph)	HOV Volume (vph)[3]	V/C [4]	LOS [4]
US 101 at Marsh Road															
NB off-ramp to Marsh Rd	Diagonal	Signal	AM	2,000	1,008	1,008	N/A	0.504	A	1,043	35	1,043	N/A	0.522	A
		Signal	PM	2,000	882	882	N/A	0.441	A	896	14	896	N/A	0.448	A
NB on-ramp from WB Marsh Rd	Diagonal	Meter	AM	900	**2,184**	**1,638**	**546**	**1.820**	**F**	**2,228**	**44**	**1,671**	**557**	**1.857**	**F**
		Meter	PM	900	**1,098**	**769**	**329**	**0.854**	**D**	**1,127**	**29**	**789**	**338**	**0.877**	**D**
SB off-ramp to Marsh Rd	Diagonal	Signal	AM	4,000	1,524	1,524	N/A	0.381	A	1,577	53	1,577	N/A	0.394	A
		Signal	PM	4,000	1,549	1,549	N/A	0.387	A	1,573	24	1,573	N/A	0.393	A
SB on-ramp from WB Marsh Rd	Loop	Meter	AM	900	200	200	N/A	0.222	A	229	29	229	N/A	0.254	A
		Meter	PM	900	285	285	N/A	0.317	A	304	19	304	N/A	0.338	A

Notes:
[1] Typical capacity for diagonal ramps is 2,000 vehicles per hour per lane (vphpl).
The capacity for non-metered ramps is determined based on the number of lanes at the ramp's constraint point.
The capacity for metered on-ramps was assumed to be 900 vphpl for mixed-flow lane ramps, regardless of the number of lanes.
At ramps that include HOV lanes, the analysis is based on the mixed-flow lane(s) ONLY.
[2] Existing ramp count data provided by Caltrans and consists of 2015 counts.
[3] HOV traffic volumes at the northbound on-ramp from westbound Marsh Road was assumed to be 25% and 30% of total traffic volume during the AM and PM peak hour, respectively, based on the percentage of HOV traffic on the freeway mainline.
[4] The calculated volume-to-capacity (V/C) ratio at the northbound on-ramp from westbound Marsh Road corresponds to the mixed-flow traffic volumes and capacity ONLY (the HOV lane is projected to operate adequately). The ramp level of service corresponds to the calculated ramp V/C ratios.
Bold indicates substandard level of service conditions, based on Caltrans level of service standard of LOS C or better.

4.
Near Term Conditions

This chapter presents Near Term traffic conditions, which are defined as conditions just prior to completion of the proposed project. Traffic volumes for near term conditions comprise volumes from existing traffic counts plus traffic generated by other approved developments in the vicinity of the project site. This chapter describes the procedure used to determine near term traffic volumes and the resulting traffic conditions. The near term scenario predicts a realistic traffic condition that would occur as approved development gets built and occupied.

The school is proposing to begin operations in August 2018 with a 100-freshman class, and increase its size by 100 new freshman students each year thereafter until the maximum student enrollment of 400 students (2021-2022 school year) is reached. For this reason, near term conditions were evaluated under both year 2018 and 2021 conditions. Near term conditions represent the baseline conditions to which project conditions are compared for the purpose of determining project impacts.

Near Term Transportation Network

Although improvements at some of the study intersections have been identified as mitigation measures for approved projects in the area (Commonwealth, Facebook, and Menlo Gateway projects), it is assumed in this analysis that the transportation network under near term conditions would be the same as the existing transportation network. Assuming the existing roadway network in the analysis of the project provides a more conservative evaluation of potential project impacts.

Near Term Traffic Volumes

Near Term conditions traffic volumes were estimated by adding to existing peak hour volumes the estimated traffic from approved but not yet constructed developments. Approved project information was obtained from the City of Menlo Park in the form of a list. The list of approved projects (summarized in Table 16 below) includes all projects in Menlo Park that were approved at the time the proposed project's Notice of Preparation (NOP) was released. Project trip assignment for approved projects was obtained from their respective traffic studies, including the *Commonwealth Corporate Center Project* Environmental Impact Report (EIR) and the *Menlo Park Facebook Campus Project* EIR. Approved projects for which a trip assignment was not available, traffic associated with these projects was derived based on the three-step process (trip generation, distribution, and assignment) described in the previous chapter.

Additionally, based on City staff recommendations on previous traffic studies and as a conservative approach, a one percent (1%) per year growth factor also was applied to the existing traffic counts to represent year 2018 and 2021 conditions. The 1% per year growth in the ambient traffic conservatively

Table 16
List of Approved Projects in the City of Menlo Park

Project Name Project address	Type of Use	Size	Units of Measure	Status
1460 El Camino Real	Residential Office Commercial	16 26,800 -12,016	du sf sf	Approved
702 Oak Grove Ave	Residential Office Residential	4 3,469 -4	du sf du	Approved
555 Glenwood Ave Marriott Residence Inn	Hotel Senior Living	138 -138	rooms rooms	Approved
1283 Willow Rd (Police/City Service Center)	Office Retail	3,800 5,096	sf sf	Approved
100-155 Constitution Dr & 100-190 Independence Dr (Menlo Gateway)	Office Health Club Restaurant Hotel Hotel Office Office	694,664 41,000 6,947 250 197,050 -133,690 -63,360	sf sf sf rooms sf sf sf	Approved
Facebook West (Bldg 20) 1 Facebook Way	Office Office	433,656 -127,246	sf sf	Approved
Commonwealth Corp. Center (151 Commonwealth - Sobrato) 162 & 164 Jefferson Dr	Office Office Warehouse Manufacturing	259,920 -19,173 -55,627 -163,058	sf sf sf sf	Approved
VA/Core 605 Willow Rd	Residential	60	du	Approved
Anton Menlo 3639 Haven Ave	Residential Manufacturing Warehousing	394 -36,471 -40,837	du sf sf	Approved
777 Hamilton Ave Greanheart	Residential manufacturing	195 -47,999	du sf	Approved
3645 Haven Ave Greystar	Residential Warehousing	146 -15,000	du sf	Approved
Sequoia Belle Haven 1221 Willow Rd MidPen	Residential Residential	90 -48	du du	Approved
Facebook Building 23 300 Constitution Dr	Office Warehouse	180,108 -184,438	sf sf	Approved
Laurel Upper School former O'Connor/GAIS 275 Elliott Dr	School School	360 -280	students students	Approved
German American School former Menlo Oaks School 475 Pope St	School School	400 -532	students students	Approved

Source: City of Menlo Park, June 18, 2015.

represents regional growth not reflected by the approved projects in the City and it is consistent with the C/CAG model regional growth projections.

Near Term traffic volumes under year 2018 and 2021 are shown graphically on Figures 11 and 12, respectively. Traffic volumes for all components of traffic are tabulated in Appendix A.

Intersection Levels of Service Under Near Term Conditions

Intersection levels of service were evaluated against City of Menlo Park and Caltrans standards. The results of the intersection level of service analysis under near term conditions are shown in Table 17.

City of Menlo Park Intersections

The results of the level of service analysis show that, measured against the City of Menlo Park level of service policy, all of the study intersection are projected to operate at unacceptable levels of service during at least one of the peak hours under both 2018 and 2021 near term conditions (results below correspond to 2021 near term conditions which are slightly worse than 2018 near term conditions):

1. Bayfront Expressway and Marsh Road - (LOS F – AM & PM peak hours)
2. Constitution Drive and Independence Drive - (LOS F – AM peak hour)
3. US 101 NB Ramps and Marsh Road - (LOS F – AM & PM peak hours)
4. US 101 SB Ramps and Marsh Road - (LOS F – AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (LOS F – PM peak hour)
6. Constitution Drive and Chrysler Drive - (LOS E – AM, LOS F – PM peak hours)
7. Jefferson Drive and Chrysler Drive - (LOS D – PM peak hour)
8. Independence Drive and Chrysler Drive - (LOS D – PM peak hour)
9. Constitution Drive and Jefferson Drive - (LOS F – PM peak hour)
10. Bayfront Expressway and Chilco Street - (LOS E – AM, LOS F – PM peak hours)
11. Constitution Drive and Chilco Street - (LOS F – AM & PM peak hours)

Caltrans Intersections

The results of the level of service analysis show that, measured against LOS D standard, all of the study Caltrans intersections are projected to operate at unacceptable levels of service during at least one of the peak hours analyzed under both 2018 and 2021 near term conditions:

1. Bayfront Expressway and Marsh Road - (LOS F – AM & PM peak hours)
3. US 101 NB Ramps and Marsh Road - (LOS F – AM & PM peak hours)
4. US 101 SB Ramps and Marsh Road - (LOS F – AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (LOS F – PM peak hour)
10. Bayfront Expressway and Chilco Street - (LOS E – AM, LOS F – PM peak hours)

The intersection level of service calculation sheets are included in Appendix B.

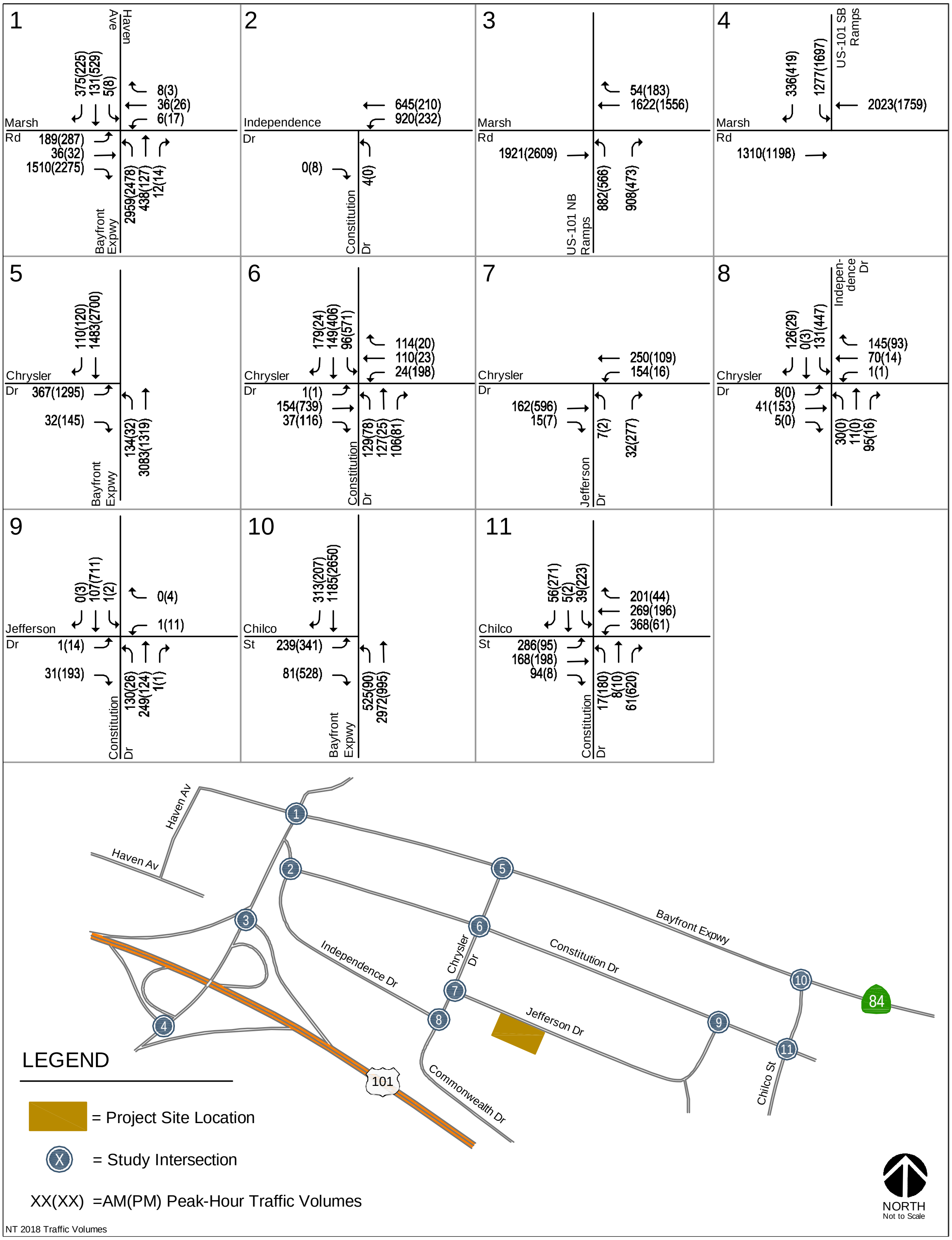

Figure 11
Near Term (Year 2018) Traffic Volumes

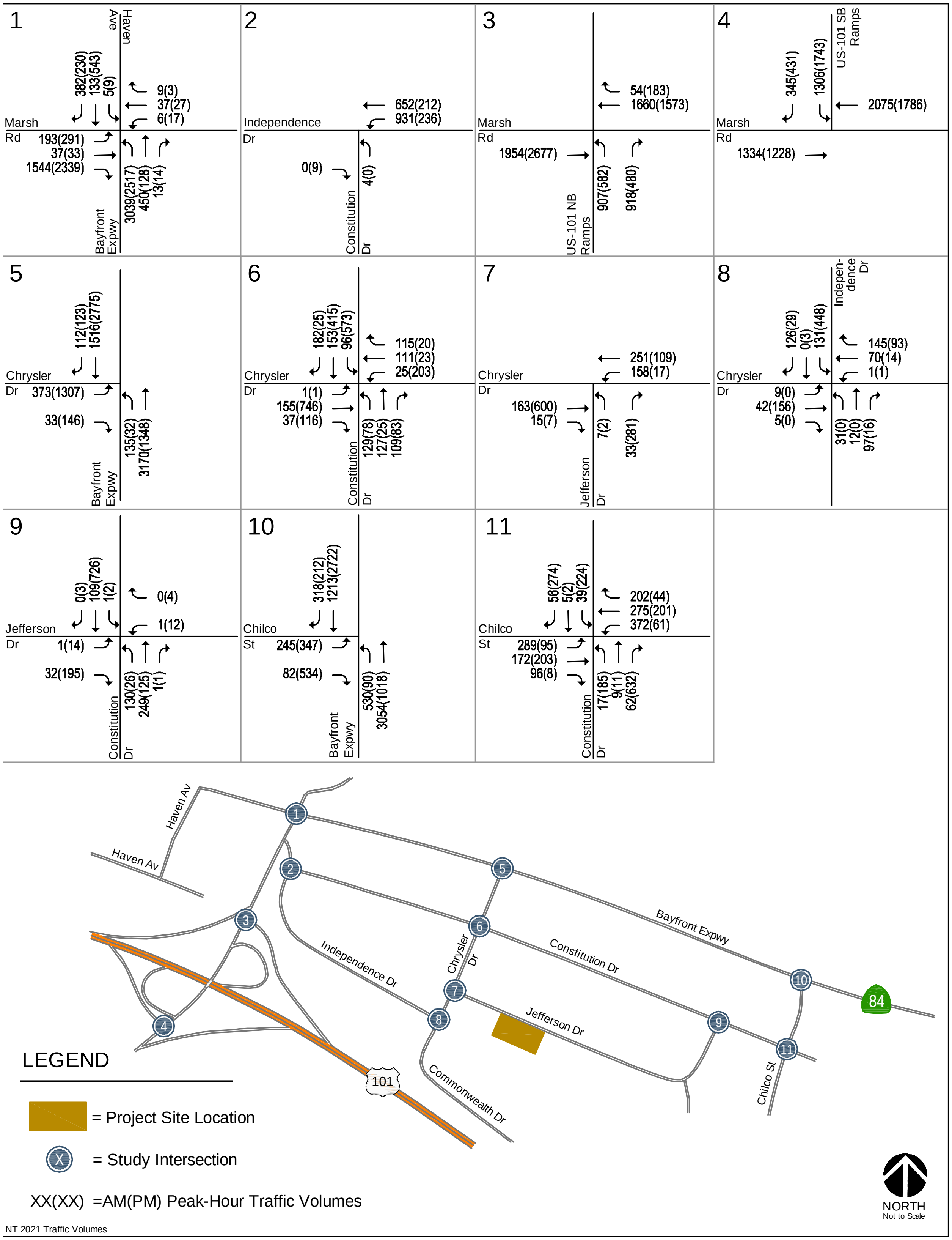

Figure 12
Near Term (Year 2021) Traffic Volumes

Table 17
Near Term Conditions Intersection Levels of Service

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Existing Delay [1]	Existing LOS [2]	Near Term 2018 (No Project) Delay [1]	Near Term 2018 (No Project) LOS [2]	Near Term 2021 (No Project) Delay [1]	Near Term 2021 (No Project) LOS [2]
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches)/ CMP	D	AM	**541.3** [3]	**F**	**801.6** [3]	**F**	**827.3** [3]	**F**
	SB Critical Delay					***79.8***	***E***	***263.3*** [3]	***F***	***273.8*** [3]	***F***
	WB Critical Delay					*53.9*	*D*	*53.9*	*D*	*54.0*	*D*
					PM	**759.5** [3]	**F**	**719.9** [3]	**F**	**748.5** [3]	**F**
	SB Critical Delay					***58.3***	***E***	***60.9***	***E***	***61.8***	***E***
	WB Critical Delay					***64.9***	***E***	***65.0***	***E***	***65.1***	***E***
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	C	AM	22.3	C	**2293.5** [3]	**F**	**3057.3** [3]	**F**
					PM	10.6	B	15.3	C	15.4	C
3	US-101 NB Ramps and Marsh Road	Signal	State	D	AM	20.1	C	**134.4** [3]	**F**	**139.2** [3]	**F**
					PM	52.5	D	**96.2**	**F**	**104.6** [3]	**F**
4	US-101 SB Ramps and Marsh Road	Signal	State	D	AM	53.4	D	**87.4**	**F**	**95.2**	**F**
					PM	25.5	C	**135.8** [3]	**F**	**140.2** [3]	**F**
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local approaches)	D	AM	11.2	B	29.7	C	30.3	C
					PM	20.1	C	**94.0**	**F**	**95.7**	**F**
	EB Critical Delay					*40.6*	*D*	***309.4*** [3]	***F***	***316.0*** [3]	***F***
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	C	AM	8.8	A	**37.6**	**E**	**40.5**	**E**
					PM	14.4	B	**465.5** [3]	**F**	**478.5** [3]	**F**
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	9.8	A	12.1	B	12.1	B
					PM	9.9	A	**31.3**	**D**	**32.7**	**D**
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	9.4	A	14.4	B	14.6	B
					PM	9.6	A	**29.1**	**D**	**29.7**	**D**
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	C	AM	9.2	A	20.0	C	20.1	C
					PM	13.6	B	**47.6**	**E**	**53.5**	**F**
10	Bayfront Expressway and Chilco Street	Signal	State (with local approaches)	D	AM	16.3	B	**64.2**	**E**	**64.9**	**E**
	EB Critical Delay					***66.5***	***E***	***78.9***	***E***	***82.3***	***F***
					PM	28.8	C	**104.7** [3]	**F**	**109.6** [3]	**F**
	EB Critical Delay					***73.3***	***E***	***580.6*** [3]	***F***	***590.7*** [3]	***F***
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	C	AM	11.6	B	**136.5** [3]	**F**	**144.5** [3]	**F**
					PM	23.6	C	**281.7** [3]	**F**	**299.7** [3]	**F**

Table 17 (Continued)
Near Term Conditions Intersection Levels of Service

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Existing		Near Term 2018 (No Project)		Near Term 2021 (No Project)	
						Delay [1]	LOS [2]	Delay [1]	LOS [2]	Delay [1]	LOS [2]

Notes:

[1] Delay = average seconds of delay per vehicle for all vehicles at signalized and 4-way stop-controlled intersections, and average worst approach delay for vehicles at 2-way/1-way stop-controlled intersections.

[2] LOS = level of service for the entire intersection at signalized and 4-way stop-controlled intersections, and for the worst approach at 2-way/1-way stop-controlled intersections.

[3] The HCM methodology for intersection analysis does not accurately calculate actual intersection operating conditions once the calculated intersection delay exceeds 100+ seconds. Once an intersection is calculated to operate with delays exceeding 100 seconds, any additional traffic to the intersection will increase the intersection delay exponentially, resulting in unrealistic excessive delays that most likely would never be experienced at an actual intersection. However, for the purpose of quantifying the projected increase in delay due to the proposed project, all calculated delays are reported, including those exceeding 100 seconds.

Entries denoted in **bold** indicate conditions that exceed the City's (and/or Caltrans for the applicable intersections) current level of service standard.

Near Term Roadway Segment Analysis

The results of the roadway segment analysis under near term conditions are summarized in Table 18. The results of the analysis show that four study roadway segments are projected to have traffic volumes that exceed their acceptable capacities. The segments include:

1. Jefferson Drive, south of Chrysler Drive
2. Chrysler Drive, between Jefferson Drive and Constitution Drive
3. Chrysler Drive, between Constitution Drive and Bayfront Expressway
4. Independence Drive, north of Chrysler Drive

Three of the above study roadway segments (Jefferson Drive, Chrysler Drive, between Jefferson Drive and Constitution Drive, and Independence Drive) are classified as local streets (which tend to have lower traffic thresholds that are more typical of residential areas) although they are located in an industrial area. If collector capacities were to be assumed for these three roadway segments, they would be projected to have traffic volumes within their capacities. The evaluation of these three segments, therefore, represents a conservative analysis.

The roadway segment of Chrysler Drive, between Constitution Drive and Bayfront Expressway, is projected to carry the most traffic out of all the study roadway segments under near term conditions.

Table 18
Near Term Conditions Roadway Segment Analysis Results

	Roadway Segment	Classification	Capacity	Existing ADT	Approved ADT	Near Term ADT
1	Jefferson Drive, south of Chrysler Drive [1]	Local	1,500	1,290	1,040	**2,330**
2	Chrysler Drive, between Jefferson Drive and Constitution Drive	Local	1,500	**3,300**	**5,070**	**8,370**
3	Chrysler Drive, between Constitution Drive and Bayfront Expressway	Collector	10,000	4,000	**9,670**	**13,670**
4	Independence Drive, north of Chrysler Drive [1]	Local	1,500	1,020	**4,720**	**5,740**
5	Constitution Drive, between Jefferson Drive and Chilco Street	Collector	10,000	2,400	3,010	5,410
6	Chilco Street, between Constitution Drive and Bayfront Expressway	Collector	10,000	7,000	1,990	8,990

Notes:
ADT = Average Daily Traffic
Roadway segment classification, capacity, and existing ADT information obtained from the *Circulation Existing Conditions* Report (City of Menlo Park General Plan), January 2015, with the exception of segments #1 and #4.
[1] Existing ADT for segments #1 and #4 obtained from the *Commonwealth Corporate Center Project* Draft Environmental Impact Report, February 2014.
Bold indicates ADT values that exceed the acceptable capacity.

Near Term Routes of Regional Significance Analysis

The results of the routes of regional significance analysis under near term conditions are summarized in Table 19. The results of the analysis shows that all directional roadway segments analyzed, with the exception of the northbound direction of the segment of Bayfront Expressway, from Willow Road to US 101, are projected to continue to operate within the segments' level of service standard.

The segment of Bayfront Expressway, northbound direction from Willow Road to US 101, is projected to operate at unacceptable LOS E during the AM peak hour under near term conditions.

Table 19
Near Term Conditions Routes of Regional Significance Analysis Results

Route	Segment	Direction	LOS Standard[1]	Capacity[2]	Peak Hour	Existing Volume[3]	Near-Term Conditions Approved Trips	Total Volume	V/C	LOS
US 101	North of Marsh Road	NB	F	9,200	AM	6,964	78	7,042	0.765	D
				9,200	PM	6,642	322	6,964	0.757	D
	North of Marsh Road	SB	F	9,200	AM	8,378	380	8,758	0.952	E
				9,200	PM	7,962	100	8,062	0.876	E
US 101	South of Marsh Road	NB	F	9,200	AM	6,386	610	6,996	0.760	D
				9,200	PM	6,091	245	6,336	0.689	D
	South of Marsh Road	SB	F	9,200	AM	7,683	185	7,868	0.855	E
				9,200	PM	7,302	547	7,849	0.853	E
Bayfront Expressway (SR 84)	from Willow Road (SR 114) to US 101	NB	D	3,300	**AM**	**2,779**	**233**	**3,012**	**0.913**	**E**
				3,300	PM	1,489	1,200	2,689	0.815	D
	from US 101 to Willow Road (SR 114)	SB	D	3,300	AM	1,773	385	2,158	0.654	B
				3,300	PM	2,543	92	2,635	0.798	C

Notes:
V/C = Volume to Capacity Ratio; LOS = Level of Service.
[1] Level of service standards as defined in the C/CAG *LOS and Performance Measure Monitoring Report* , 2015.
[2] The *Highway Capacity Manual* identifies capacity values for freeway segments with six or more lanes as 2,300 vehicles per hour per lane (vphpl); the capacity for four-lane freeway segments is identified as 2,200 vphpl.
Arterial capacity is estimated to be 1,100 vphpl, based on a saturation flow rate of 1,900 vphpl and assuming the arterial facility receives 60 percent of the green time.
[3] Existing volumes obtained from Caltrans and consist of 2015 counts.
Bold indicates segment operating at substandard levels of service.

Near Term Freeway Ramp Analysis

Table 20 shows the projected near term ramp volumes and levels of service during the peak hours.

Based on the calculated V/C ratios, the following freeway ramps are projected to operate at substandard levels, based on Caltrans standards:

Northbound on-ramp from westbound Marsh Road (LOS F – AM, LOS E – PM peak hours)
Southbound on-ramp from westbound Marsh Road (LOS D - PM peak hour)

The remainder of the study interchange ramps are projected to operate at acceptable levels.

Table 20
Near Term Conditions Freeway Ramp Analysis Results

Interchange/Ramp	Ramp Type	Existing Control Type	Peak Hour	Ramp Capacity (vph)[1]	Near-Term Conditions: Total Volume	Mixed-flow Volume (vph)[2]	HOV Volume (vph)[3]	V/C [4]	LOS [4]
US 101 at Marsh Road									
NB off-ramp to Marsh Rd	Diagonal	Signal	AM	2,000	1,553	1,553	N/A	0.777	C
		Signal	PM	2,000	1,106	1,106	N/A	0.553	A
NB on-ramp from WB Marsh Rd	Diagonal	Meter	AM	900	**2,238**	**1,679**	**560**	**1.865**	**F**
		Meter	PM	900	**1,281**	**897**	**384**	**0.996**	**E**
SB off-ramp to Marsh Rd	Diagonal	Signal	AM	4,000	2,116	2,116	N/A	0.529	A
		Signal	PM	4,000	1,841	1,841	N/A	0.460	A
SB on-ramp from WB Marsh Rd	Loop	Meter	AM	900	305	305	N/A	0.339	A
		Meter	PM	900	**791**	**791**	**N/A**	**0.879**	**D**

Notes:
[1] Typical capacity for diagonal ramps is 2,000 vehicles per hour per lane (vphpl).
The capacity for non-metered ramps is determined based on the number of lanes at the ramp's constraint point.
The capacity for metered on-ramps was assumed to be 900 vphpl for mixed-flow lane ramps, regardless of the number of lanes. At ramps that include HOV lanes, the analysis is based on the mixed-flow lane(s) ONLY.
[2] Existing ramp count data provided by Caltrans and consists of 2015 counts.
[3] HOV traffic volumes at the northbound on-ramp from westbound Marsh Road was assumed to be 25% and 30% of total traffic volume during the AM and PM peak hour, respectively, based on the percentage of HOV traffic on the freeway mainline.
[4] The calculated volume-to-capacity (V/C) ratio at the northbound on-ramp from westbound Marsh Road corresponds to the mixed-flow traffic volumes and capacity ONLY (the HOV lane is projected to operate adequately).
The ramp level of service corresponds to the calculated ramp V/C ratios.
Bold indicates substandard level of service conditions, based on Caltrans level of service standard of LOS C or better.

5. Near Term Plus Project Conditions

This chapter describes near-term traffic conditions that most likely would occur when the project is complete. It includes a description of the method by which project traffic is estimated and any impacts caused by the project. Near term plus project conditions, also referred to as *project conditions*, were evaluated relative to near term conditions in order to determine potential project impacts. This traffic scenario represents a more congested traffic condition than the existing plus project scenario, since it includes traffic generated by approved but not yet built projects in the area.

The school is proposing to begin operations in August 2018 with a 100-freshman class, and increase its size by 100 new freshman students each year thereafter until the maximum student enrollment of 400 students (2021-2022 school year) is reached. For this reason, near term plus project conditions were evaluated under two project scenarios:

- Year 2018 (school opening year/100 students) project conditions
- Year 2021 (maximum student enrollment/400 students) project conditions

Near term project conditions were evaluated relative to near term conditions in order to determine potential project impacts.

Although some of the information presented within this chapter has already being described in Chapter 3 (Existing Plus Project Conditions), it is presented again within this chapter for the reader's convenience.

Significant Impact Criteria

For this analysis, the criteria used to determine significant impacts on signalized intersections are based on City of Menlo Park Level of Service standards. The City of Menlo Park LOS Policy is the adopted established threshold for CEQA. Project impacts also were analyzed according to the Caltrans methodology and level of service standards for the State study intersections and freeway interchange. Impacts on Routes of Regional Significance were evaluated based on CMP methodology and standards.

The level of service standards and significant impact criteria are described in Chapter 1 (Introduction) of this report.

Transportation Network Under Near Term Plus Project Conditions

It is assumed in this analysis that the transportation network under project conditions would be the same as described under background conditions.

Project Description

The proposed new high school would be part of the Sequoia Union High School District (SUHSD). The project site is located at 150 Jefferson Drive and consists of an approximately 2.1-acre site within an area in Menlo Park that is transitioning from industrial/warehouse land uses to newer corporate campuses and mixed biotechnology, commercial, and office uses.

Currently, an approximately 44,000 square-foot building occupies the site and serves as the corporate headquarters and sales office for Bay Associates Wireless Technologies, a cable and cable assemblies business. The existing facilities on site are proposed to be demolished and replaced with a new school campus. The new school, as proposed, would serve up to 400 students in the grades 9 through 12 with 35 faculty/staff members, and would consist of an approximately 40,000 square-foot three-story building. The school is planned to be in session from 8:15-8:30 AM to 3:30-3:45 PM during the traditional school year, with summer school offerings as well.

The proposed school is intended to alleviate increases in the SUHSD's existing and projected student enrollment, and therefore, would be open to all SUHSD students. However, the SUHSD anticipates the school would primarily serve students from the southern part of the SUHSD (Redwood City, Menlo Park, and East Palo Alto). Menlo Park's Belle Haven neighborhood is approximately less than half a mile southeast of the project site (across the Dumbarton rail corridor) and the City's Suburban Park/Lorelei Manor/Flood Park neighborhood is approximately 0.2 miles south of the site (across US 101). It was projected that approximately 10 percent (%) of the students of the new school would come from these two neighborhoods (this is discussed in more detail in the following sections).

Construction of the proposed school is anticipated to begin in the first quarter of 2017, with the target date of August 2018 for opening the new school. The first year (2018-2019 school year), the school is anticipated to serve a maximum of 100 freshman students, increasing its size by 100 new freshman students each year thereafter until the maximum student enrollment of 400 students (2021-2022 school year) is reached.

Additionally, the SUHSD may enter into a partnership with the San Mateo County Community College District (SMCCCD) to provide content-specific high school courses as well as provide community college courses at the school campus several nights a week. If the SUHSD and SMCCCD decide to offer community college classes at the proposed Menlo Park Small High School campus, they would be no more than four night classes with start times after 7:00 PM.

Project Trip Generation, Distribution, and Assignments

The project trip generation, distributions, and assignments for the proposed 400-student school were presented in Chapter 3 (Existing plus Project Conditions). These are summarized below. Additionally, the trip generation and assignment for a 100-student school also are described below.

Trip Generation Estimates

The trips generated by the proposed school were estimated based on trip generation counts conducted at Everest High School. Everest High School is an existing SUHSD small high school with similar characteristics to the proposed school project, including the school's maximum capacity of 400 students and the general service area.

The magnitude of traffic added to the roadway system by the proposed project was estimated by multiplying the proposed number of student by the surveyed Everest High School trip generation rates. Based on the surveyed rates, it is estimated that the proposed 100-student school would generate a total of approximately 88 trips (50 inbound and 38 outbound) during the AM peak hour and 51 trips (22 inbound and 29 outbound) during the PM peak hour. As discussed in Chapter 3, the 400-student school would generate a total of approximately 354 trips (202 inbound and 152 outbound) during the AM peak hour and 206 trips (91 inbound and 115 outbound) during the PM peak hour. This represents the peak-hour traffic projected to be generated by the proposed project (gross project trips) at the school's schools opening year (year 2018) and at full capacity (year 2021).

After reduction of the existing site trips, the proposed 100-student school is projected to generate a net total of 56 AM peak hour trips (25 inbound and 31 outbound) and 19 PM peak hour trips (10 inbound and 9 outbound) while the 400-student school project is estimated to generate a net total of 322 AM peak hour trips (177 inbound and 145 outbound) and 174 PM peak hour trips (79 inbound and 95 outbound).

The trip generation estimates for both the 100- and 400-student school are presented in Table 21.

Trip Distribution

The trip distribution pattern for the proposed school was estimated based on information provided by the school on the anticipated service areas, on information on the existing service areas for Everest High School, and on existing travel patterns and the location of complementary land uses in the project area. The trip distribution patterns for the proposed project are illustrated on Figure 8, in Chapter 3.

Trip Assignment

The peak hour trips generated by the proposed development were assigned to the roadway system in accordance with the trip distribution patterns discussed above.

The assignment conservatively assumes that all project traffic represents new trips on the roadway network. Additionally, traffic associated with the existing building on site was assigned to the roadway network as negative trips, representing the elimination of these trips from the roadway network. Thus, with the addition of the traffic projected to be generated by the proposed school project (gross project trips) to the roadway network and the elimination of the trips associated with the existing building (negative trips), the total traffic assignment represents the net site generated traffic.

The net project trip assignment at the study intersections under the 100-student school traffic conditions scenario is shown graphically on Figure 13. The net project trip assignment for the 400-student school traffic conditions scenario is presented on Figure 9, in Chapter 3.

Table 21
Proposed School Trip Generation Estimates - 100- and 400-Student School

			AM Peak Hour						PM Peak Hour					
			Pk-Hr	Splits		Trips			Pk-Hr	Splits		Trips		
Land Use	Size		Factor	In	Out	In	Out	Total	Factor	In	Out	In	Out	Total
Existing Land Use[1]														
Bay Associate	44,000	s.f.	0.73	78%	22%	25	7	32	0.73	36%	64%	12	20	32
Proposed Project[2]														
High School	100	students	0.88	57%	43%	50	38	88	0.51	44%	56%	22	29	51
High School	400	students	0.88	57%	43%	202	152	354	0.51	44%	56%	91	115	206
Net Project Trips (100-student school)						**25**	**31**	**56**				**10**	**9**	**19**
Net Project Trips (400-student school)						**177**	**145**	**322**				**79**	**95**	**174**

Notes:
[1] Trip generation estimates for the existing use on site are based on average trip generation rates for manufacturing land use (land use code 140) contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition, 2012.
[2] Trip generation estimates for the proposed school project are based on trip generation counts conducted at Everest High School on April 9, 2015.

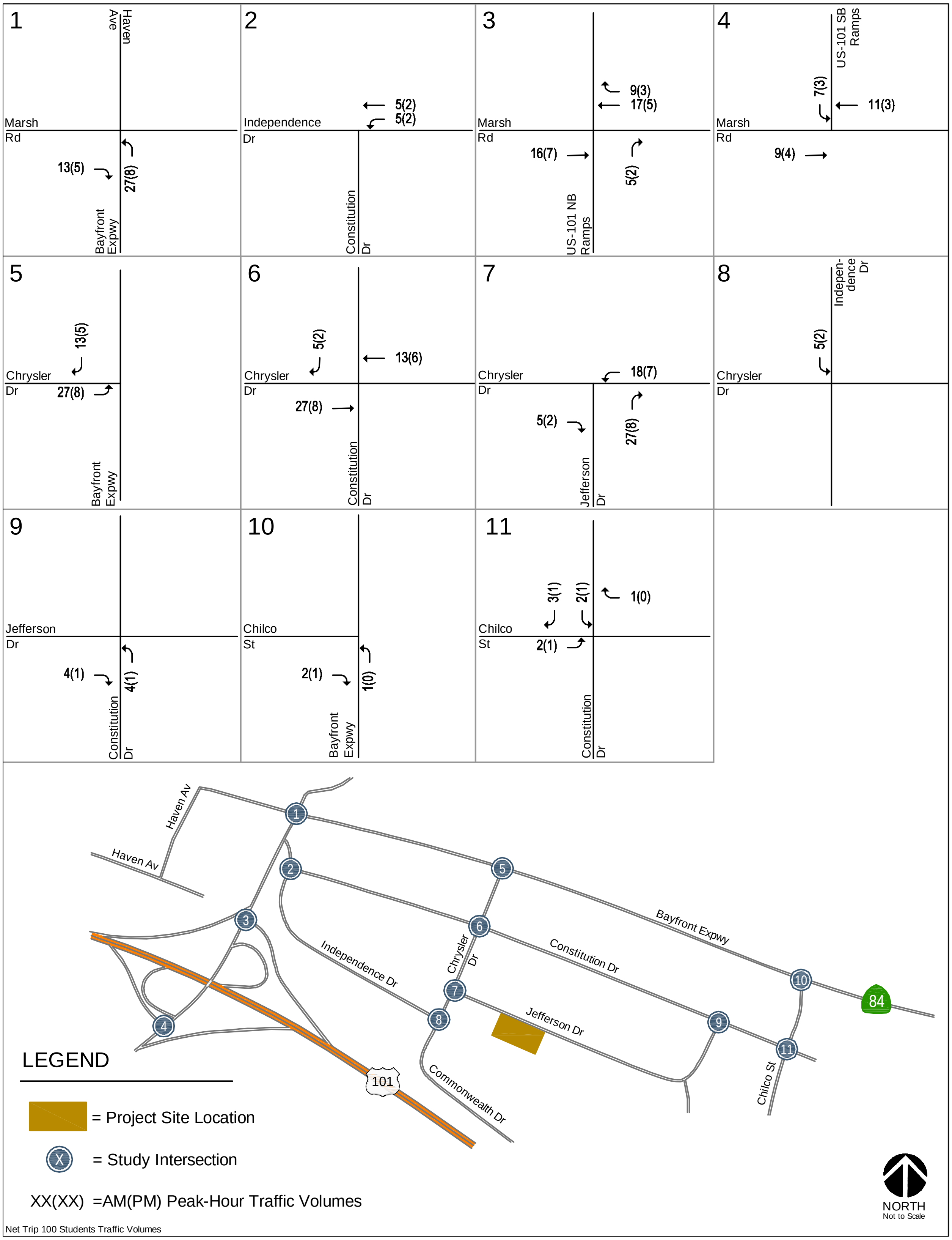

Figure 13
Net Project Trip Assignment (100-Student School)

Near Tear Plus Project Traffic Volumes

The project trips, as represented in the project trip assignments discussed above, were added to near term traffic volumes to obtain near term plus project traffic volumes. The near term plus project traffic volumes for the 100-student and 400-student school scenarios are presented on Figures 14 and 15, respectively. Traffic volumes for all components of traffic are tabulated in Appendix A.

Projected peak-hour project trips also were added to the near term traffic volumes at the study Routes of Regional Significance segments and freeway interchange ramps for the analysis of those facilities. Daily project traffic volumes for the analysis of the roadway segments were estimated by adding the AM and PM peak-hour project trips and increasing them by 10%. The 10% increase in project traffic represents all traffic generated by the proposed school during the off-peak hours. The roadway segment and ramp analyses under near term plus project conditions were completed for the 400-student school scenario only.

Intersection LOS Under Near Term Plus Project Conditions

Intersection levels of service were evaluated against City of Menlo Park and Caltrans Level of Service standards. The results of the level of service analysis under near term plus project conditions are summarized in Tables 22 and 23 for the 100-student school (year 2018) and 400-student school (year 2021) scenarios, respectively.

It should be noted that some of the calculated intersection delays are unrealistically excessive delays that most likely would never be experienced at an intersection (drivers tend to look for alternative routes, or different times to travel, when long delays are experienced at an intersection). This is the result of the limitations of the HCM methodology equations, which will calculate inaccurate intersection operating conditions/delays once the calculated delay exceeds more than 100 seconds (LOS F conditions). Once the intersection is calculated to operate with delays exceeding 100+ seconds, any additional traffic added to the intersection increases the intersection delay exponentially, resulting in unrealistic delays. Thus, the effect that 10 additional trips would have at an intersection operating with an average delay of 100 seconds, for example, would be much greater than the effect the same 10 trips would have at an intersection operating with an average delay of 20 seconds. Nevertheless, all intersection delays are reported for the purpose of quantifying the projected increase in delay due to the proposed project.

City of Menlo Park Intersections

The results of the level of service analysis show that, measured against the City of Menlo Park level of service policy, all of the signalized study intersection are projected to operate at unacceptable levels of service during at least one of the peak hours under both the 100-student and 400-student school project scenarios.

The proposed 100-student school scenario would have a negative impact, based on City of Menlo Park impact criteria, on the following study intersections:

2. Constitution Drive and Independence Drive - (Impact - AM peak hour)
3. US 101 NB Ramps and Marsh Road - (Impact – AM & PM peak hours)
4. US 101 SB Ramps and Marsh Road – (Impact – AM peak hour)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
6. Constitution Drive and Chrysler Drive - (Impact - AM & PM peak hours)
7. Jefferson Drive and Chrysler Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - PM peak hour)
11. Constitution Drive and Chilco Street - (Impact – AM & PM peak hours)

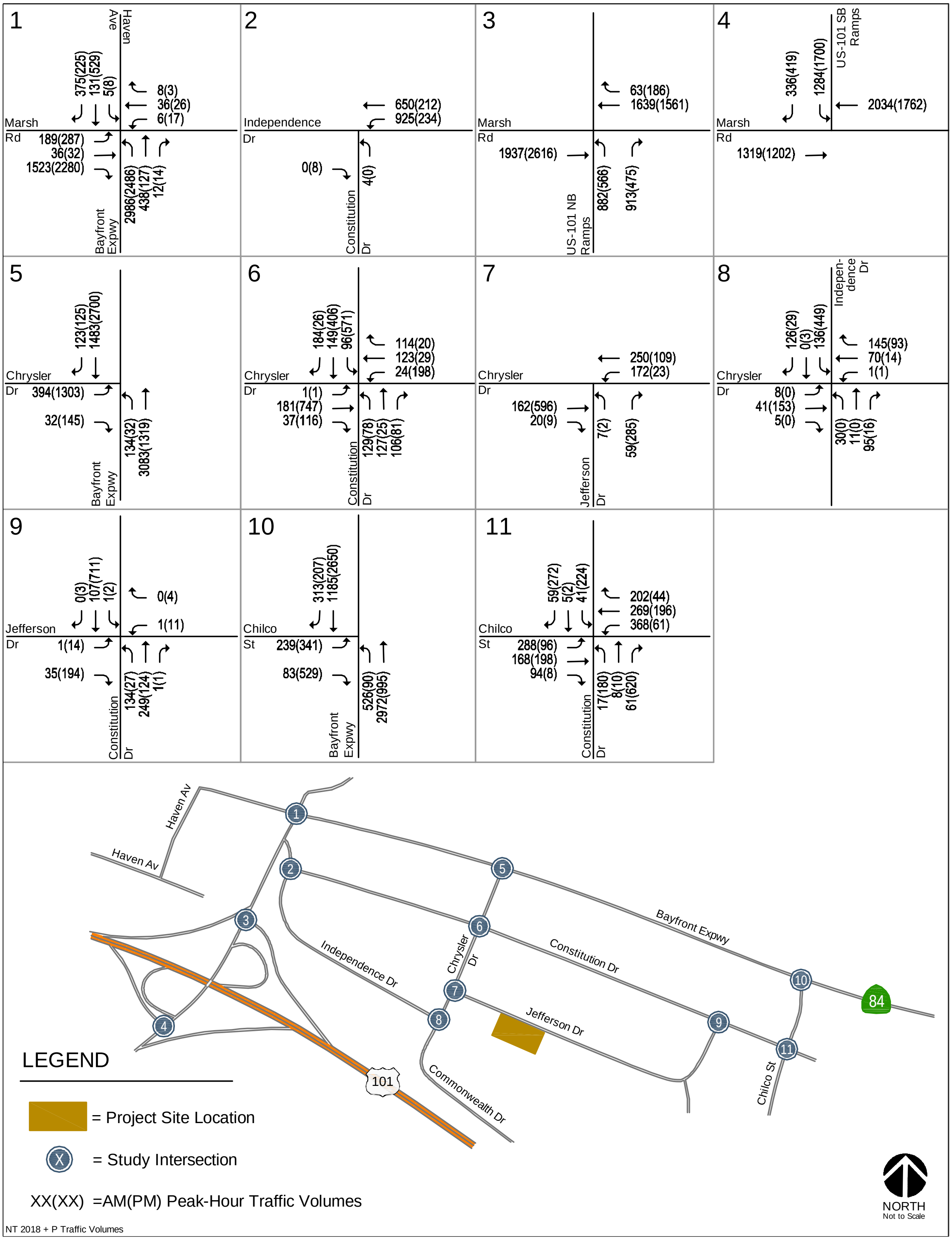

Figure 14
Near Term Plus Project Traffic Volumes (100-Student School Scenario)

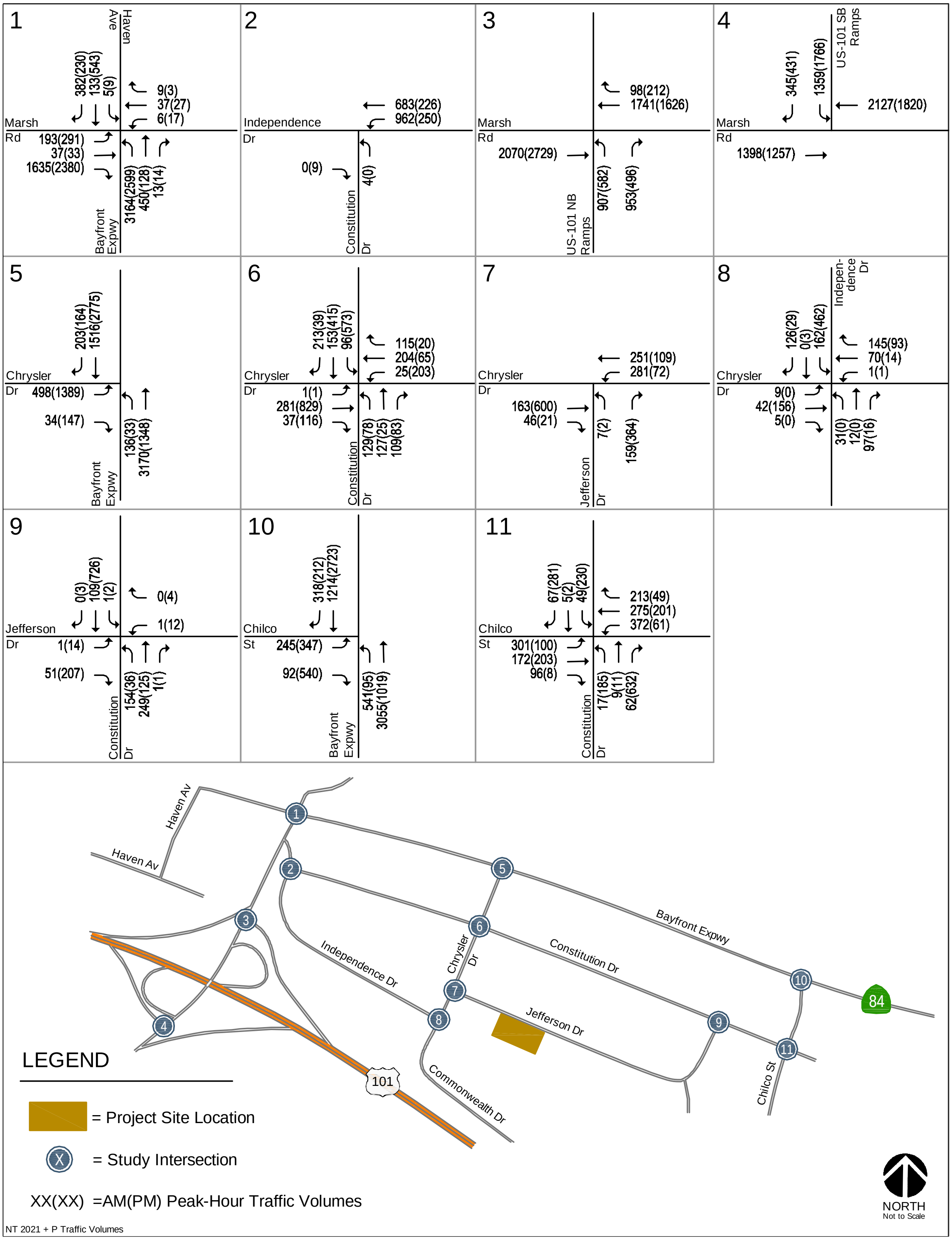

Figure 15
Near Term Plus Project Traffic Volumes (400-Student School Scenario)

Table 22
Near Term Plus Project Conditions Intersection Levels of Service – 100-Student School Scenario

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Near Term 2018 (No Project) Delay [1]	Near Term 2018 (No Project) LOS [2]	Near Term 2018 With Project (100 students) Delay [1]	Near Term 2018 With Project (100 students) LOS [2]	Near Term 2018 With Project (100 students) Change in Delay [3]
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches)/ CMP	D	AM	**801.6** [4]	**F**	**812.3** [4]	**F**	**10.7**
	SB Critical Delay					***263.3*** [4]	***F***	***263.3*** [4]	***F***	***0.0***
	WB Critical Delay					*53.9*	*D*	*53.9*	*D*	*0.0*
					PM	**719.9** [4]	**F**	**722.4** [4]	**F**	**2.5**
	SB Critical Delay					***60.9***	***E***	***60.9***	***E***	***0.0***
	WB Critical Delay					***65.0***	***E***	***65.0***	***E***	***0.0***
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	C	AM	**2293.5** [4]	**F**	**2664.1** [4]	**F**	**370.6**
					PM	15.3	C	15.4	C	0.1
3	US-101 NB Ramps and Marsh Road	Signal	State	D	AM	**134.4** [4]	**F**	**136.8** [4]	**F**	**2.4**
					PM	**96.2**	**F**	**97.1**	**F**	**0.9**
4	US-101 SB Ramps and Marsh Road	Signal	State	D	AM	**87.4**	**F**	**89.1**	**F**	**1.7**
					PM	**135.8** [4]	**F**	**136.3** [4]	**F**	**0.5**
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local approaches)	D	AM	29.7	C	30.6	C	0.9
					PM	**94.0**	**F**	**95.2**	**F**	**1.2**
	EB Critical Delay					***309.4*** [4]	***F***	***313.1*** [4]	***F***	***3.7***
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	C	AM	**37.6**	**E**	**47.6**	**E**	**10.0**
					PM	**465.5** [4]	**F**	**472.0** [4]	**F**	**6.5**
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	12.1	B	11.8	B	-0.3
					PM	**31.3**	**D**	**33.2**	**D**	**1.9**
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	14.4	B	14.7	B	0.2
					PM	**29.1**	**D**	**29.4**	**D**	**0.3**
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	C	AM	20.0	C	20.5	C	0.5
					PM	**47.6**	**E**	**48.1**	**E**	**0.6**
10	Bayfront Expressway and Chilco Street	Signal	State (with local approaches)	D	AM	**64.2**	**E**	**64.4**	**E**	**0.2**
	EB Critical Delay					***78.9***	***E***	***78.9***	***E***	***0.0***
					PM	**104.7** [4]	**F**	**104.9** [4]	**F**	**0.2**
	EB Critical Delay					***580.6*** [4]	***F***	***582.3*** [4]	***F***	***1.7***
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	C	AM	**136.5** [4]	**F**	**140.1** [4]	**F**	**3.6**
					PM	**281.7** [4]	**F**	**282.7** [4]	**F**	**1.0**

Table 22 (Continued)
Near Term Plus Project Conditions Intersection Levels of Service – 100-Student School Scenario

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Near Term 2018 (No Project) Delay [1]	Near Term 2018 (No Project) LOS [2]	Near Term 2018 With Project (100 students) Delay [1]	Near Term 2018 With Project (100 students) LOS [2]	Near Term 2018 With Project (100 students) Change in Delay [3]

Notes:

[1] Delay = average seconds of delay per vehicle for all vehicles at signalized and 4-way stop-controlled intersections, and average worst approach delay for vehicles at 2-way/1-way stop-controlled intersections.

[2] LOS = level of service for the entire intersection at signalized and 4-way stop-controlled intersections, and for the worst approach at 2-way/1-way stop-controlled intersections.

[3] Level of service impact thresholds include a change in the average intersection delay of 23 seconds or more at intersections operating at acceptable levels and a change in all critical movements of 0.8 seconds or more at City of Menlo Park intersections or a change of 0.8 seconds or more on the local approaches' most critical movement at State-controlled intersections operating at substandard levels.
Level of service impact threshold for State intersections operating at unacceptable levels of service (LOS E or F) is the increase of 4 or more seconds to the average intersection delay.

[4] The HCM methodology for intersection analysis does not accurately calculate actual intersection operating conditions once the calculated intersection delay exceeds 100+ seconds. Once an intersection is calculated to operate with delays exceeding 100 seconds, any additional traffic to the intersection will increase the intersection delay exponentially, resulting in unrealistic excessive delays that most likely would never be experienced at an actual intersection. However, for the purpose of quantifying the projected increase in delay due to the proposed project, all calculated delays are reported, including those exceeding 100 seconds.

Entries denoted in **bold** indicate conditions that exceed the City's (and/or Caltrans for the applicable intersections) current level of service standard.

- Denotes significant impact based on City of Menlo Park criteria.

- Denotes significant impact based on Caltrans criteria.

Table 23
Near Term Plus Project Conditions Intersection Levels of Service – 400-Student School Scenario

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Near Term 2021 (No Project) Delay [1]	Near Term 2021 (No Project) LOS [2]	Near Term 2021 With Project (400 students) Delay [1]	Near Term 2021 With Project (400 students) LOS [2]	Near Term 2021 With Project (400 students) Change in Delay [3]
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches)/ CMP	D	AM	**827.3** [4]	**F**	**899.5** [4]	**F**	**72.2**
	SB Critical Delay					***273.8*** [4]	***F***	***273.8*** [4]	***F***	***0.0***
	WB Critical Delay					*54.0*	*D*	*54.0*	*D*	*0.0*
					PM	**748.5** [4]	**F**	**770.3** [4]	**F**	**21.8**
	SB Critical Delay					***61.8***	***E***	***61.8***	***E***	***0.0***
	WB Critical Delay					***65.1***	***E***	***65.1***	***E***	***0.0***
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	C	AM	**3057.3** [4]	**F**	**10000.0** [4]	**F**	**6942.8**
					PM	15.4	C	16.2	C	0.8
3	US-101 NB Ramps and Marsh Road	Signal	State	D	AM	**139.2** [4]	**F**	**158.6** [4]	**F**	**19.4**
					PM	**104.6** [4]	**F**	**111.9** [4]	**F**	**7.3**
4	US-101 SB Ramps and Marsh Road	Signal	State	D	AM	**95.2**	**F**	**104.1**	**F**	**8.9**
					PM	**140.2** [4]	**F**	**146.4** [4]	**F**	**6.2**
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local approaches)	D	AM	30.3	C	38.3	D	8.0
					PM	**95.7**	**F**	**108.8** [4]	**F**	**13.1**
	EB Critical Delay					***316.0*** [4]	***F***	***356.2*** [4]	***F***	***40.2***
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	C	AM	**40.5**	**E**	**120.9**	**F**	**80.4**
					PM	**478.5** [4]	**F**	**540.0** [4]	**F**	**61.5**
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	12.1	B	13.8	B	**1.6**
					PM	**32.7**	**D**	**65.3**	**F**	**32.6**
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	14.6	B	16.1	C	1.5
					PM	**29.7**	**D**	**32.1**	**D**	**2.4**
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	C	AM	20.1	C	22.9	C	2.9
					PM	**53.5**	**F**	**63.0**	**F**	**9.5**
10	Bayfront Expressway and Chilco Street	Signal	State (with local approaches)	D	AM	**64.9**	**E**	**67.6**	**E**	**2.7**
	EB Critical Delay					***82.3***	***F***	***82.3***	***F***	***0.0***
					PM	**109.6** [4]	**F**	**111.5** [4]	**F**	**1.9**
	EB Critical Delay					***590.7*** [4]	***F***	***602.5*** [4]	***F***	***11.8***
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	C	AM	**144.5** [4]	**F**	**156.6** [4]	**F**	**12.1**
					PM	**299.7** [4]	**F**	**309.6** [4]	**F**	**9.9**

Table 23 (Continued)
Near Term Plus Project Conditions Intersection Levels of Service – 400-Student School Scenario

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Near Term 2021 (No Project)		Near Term 2021 With Project (400 students)		
						Delay [1]	LOS [2]	Delay [1]	LOS [2]	Change in Delay [3]

Notes:

[1] Delay = average seconds of delay per vehicle for all vehicles at signalized and 4-way stop-controlled intersections, and average worst approach delay for vehicles at 2-way/1-way stop-controlled intersections.

[2] LOS = level of service for the entire intersection at signalized and 4-way stop-controlled intersections, and for the worst approach at 2-way/1-way stop-controlled intersections.

[3] Level of service impact thresholds include a change in the average intersection delay of 23 seconds or more at intersections operating at acceptable levels and a change in all critical movements of 0.8 seconds or more at City of Menlo Park intersections <u>or</u> a change of 0.8 seconds or more on the local approaches' most critical movement at State-controlled intersections operating at substandard levels.
Level of service impact threshold for State intersections operating at unacceptable levels of service (LOS E or F) is the increase of 4 or more seconds to the average intersection delay.

[4] The HCM methodology for intersection analysis does not accurately calculate actual intersection operating conditions once the calculated intersection delay exceeds 100+ seconds. Once an intersection is calculated to operate with delays exceeding 100 seconds, any additional traffic to the intersection will increase the intersection delay exponentially, resulting in unrealistic excessive delays that most likely would never be experienced at an actual intersection. However, for the purpose of quantifying the projected increase in delay due to the proposed project, all calculated delays are reported, including those exceeding 100 seconds.

Entries denoted in **bold** indicate conditions that exceed the City's (and/or Caltrans for the applicable intersections) current level of service standard.

- Denotes significant impact based on City of Menlo Park criteria.
- Denotes significant impact based on Caltrans criteria.

The proposed 400-student school scenario would have a negative impact, based on City of Menlo Park impact criteria, on the following study intersections:

2. Constitution Drive and Independence Drive - (Impact - AM peak hour)
3. US 101 NB Ramps and Marsh Road - (Impact - AM and PM peak hours)
4. US 101 SB Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
6. Constitution Drive and Chrysler Drive - (Impact - AM & PM peak hours)
7. Jefferson Drive and Chrysler Drive - (Impact - PM peak hour)
8. Independence Drive and Chrysler Drive - (Impact - PM peak hour)
9. Constitution Drive and Jefferson Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - PM peak hour)
11. Constitution Drive and Chilco Street - (Impact - AM & PM peak hours)

Caltrans Intersections

The results of the level of service analysis show that, measured against LOS D standard, all of the study Caltrans intersections are projected to operate at unacceptable levels of service during at least one of the peak hours analyzed under both the 100-student school (year 2018) and 400-student school (year 2021) project scenarios.

The proposed 100-student school scenario would have a negative impact, based on Caltrans impact criteria, on the following intersection:

1. Bayfront Expressway and Marsh Road - (Impact - AM peak hour)

The proposed 400-student school scenario would have a negative impact, based on Caltrans impact criteria, on the following Caltrans intersections:

1. Bayfront Expressway and Marsh Road - (Impact - AM & PM peak hours)
3. US 101 Northbound Ramps and Marsh Road - (Impact - AM & PM peak hours)
4. US 101 Southbound Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)

The intersection level of service calculation sheets are included in Appendix B.

Intersection Mitigation Measures under 2018 and 2021 Project Conditions

Based on City of Menlo Park impact criteria, it is projected that a total of seven study intersections would be impacted by the proposed project under the 2018 project conditions (100-student school) scenario, while ten study intersections would be impacted by the 2021 project conditions (400-student school) scenario. In addition, four of the five Caltrans intersections also are projected to be impacted by the proposed 400-student school project scenario, based on Caltrans impact criteria.

Described below are the intersection impacts that are projected to occur under both project conditions scenarios analyzed and possible intersection mitigation improvements. However, their feasibility has yet to be determined by the lead agency (City of Menlo Park or Caltrans). Subsequent detailed analyses of the improvements, in conjunction with the implementation of other approved projects in the area, is needed to determine the feasibility of each of the improvements below. Such reviews may show that the full intersection improvements, as described below, are not feasible due to right-of-way constraints, detrimental impacts to non-auto modes, or other environmental impacts. If the full intersection improvements are not implemented or if there are no feasible improvements, the intersection would continue to operate at substandard levels and it would be considered a ***significant and unavoidable*** level of service impact.

At locations where implementation of the proposed improvements is not feasible, the proposed project could be required to contribute to the implemention of alternative transportation system improvements that are focused on making the transportation system more efficient and improving the City's overall multimodal transportation system. Multimodal transporation system improvements could be required in lieu of intersection improvements to offset a project impact, improving the transporation system for all users. Examples of such improvements could include signal timing changes, signal synchronization, adaptive traffic signal systems, bicycle, pedestrian and transit infrastructure improvements, and streetscape projects to enhance the pedestrian environment. However, such improvements may not completely offset the intersection impact. As such, the impact would still be considered significant and unavoidable. Therefore, it is recommended that the SUHSD work with the City of Menlo Park to determine the feasibility of each of the proposed mitigations and their implementation, or determine the implementation of alternative transportation system improvements as possible mitigation measures, as well as determine the project's fair share contribution towards the intersection improvements.

It should be noted that some of the improvements listed below have already been identified as mitigation measures for approved projects in the vicinity of the project site. However, those improvements were not assumed in place for the analysis of the proposed project in an effort to identify the effect of the proposed project on the existing transportation network and provide a more conservative evaluation of potential project impacts.

The proposed improvements are shown graphically on Figure 16. The resulting level of service conditions with the proposed intersection improvements under 2021 near term plus project conditions are summarized in Table 24.

1. Bayfront Expressway and Marsh Road

Impact: This State-controlled signalized intersection is projected to operate at unacceptable LOS F during both the AM and PM peak hours under both the 2018 (100-student scenario) and 2021 (400-student scenario) project conditions. However, the project is not projected to increase the most critical delay on the local approaches of the intersection. Therefore, based on City of Menlo Park intersection level of service impact criteria, the proposed project would not have a significant impact at this intersection (***less than significant impact***).

Based on Caltrans intersection impact criteria, the proposed project is projected to result in an impact at this intersection during the AM peak hour under the 2018 project conditions scenario and during both the AM and PM peak hours under the 2021 project conditions scenario (project would increase intersection delay by 4 seconds or more).

Mitigation: A potential mitigation measure at this intersection includes the addition of a third eastbound right-turn lane on Marsh Road and restriping the southbound through lane as a shared right-and-through lane. Intersection operations would improve with implementation of the above improvements. However, the intersection would continue to operate at unacceptable levels of service during the peak hours under the 2021 project conditions scenario. Additionally, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

The restriping of the southbound approach of this intersection has been identified as an improvement for the St. Anton (Haven Avenue Residential) development and it is currently in the design phase. The addition of a third eastbound right-turn lane on Marsh Road was identified as a potential mitigation measure for the approved Commonwealth Corporate Center project. However, the impact was determined significant and unavoidable because the intersection is under the jurisdiction of Caltrans and the City cannot guarantee that the mitigation measure would be implemented.

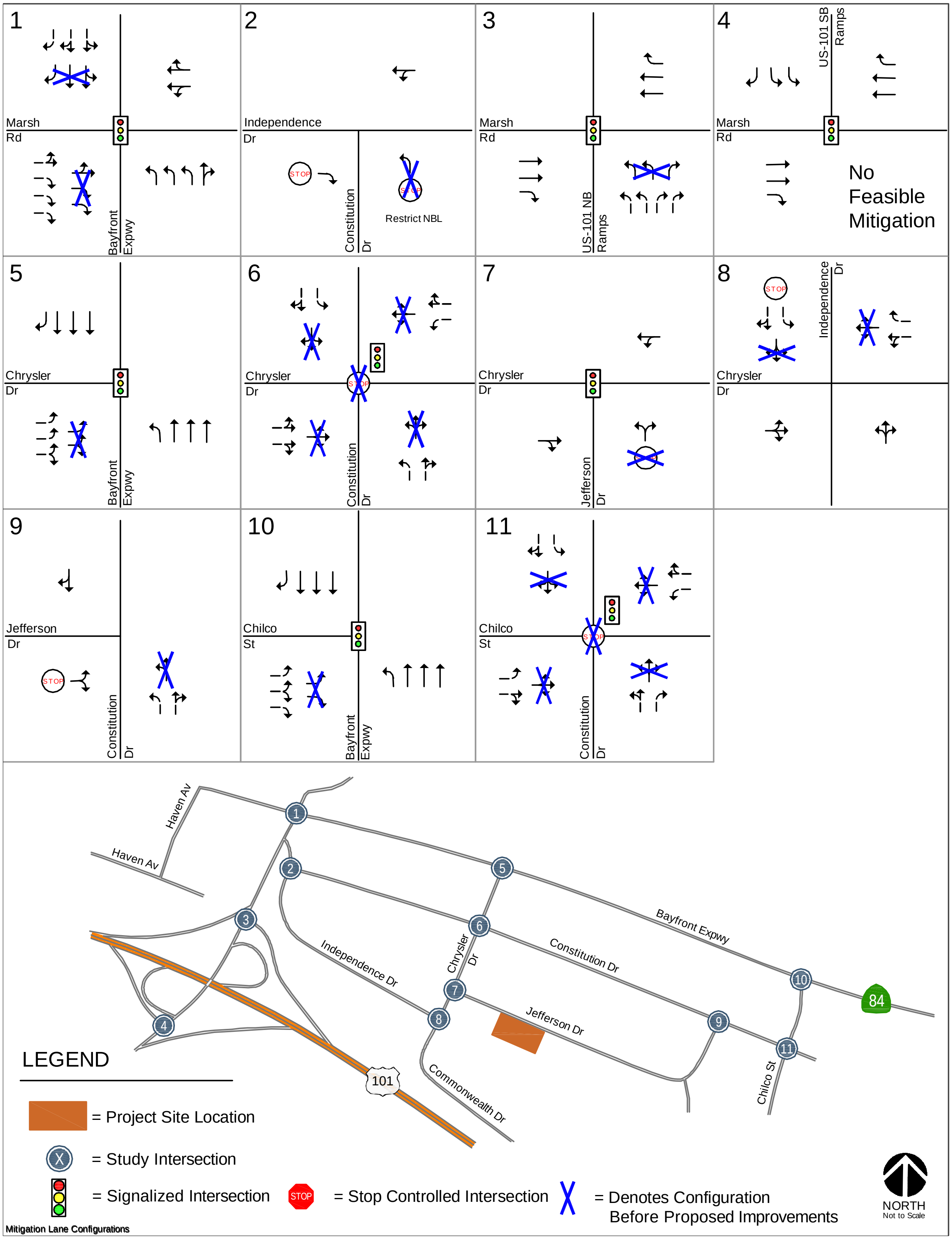

Figure 16
Proposed Intersction Mitigation Measures

Table 24
Near Term Plus Project Conditions Intersection Levels of Service – With Mitigations (400-Student School Scenario)

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Near Term 2021 (No Project) Delay [1]	Near Term 2021 (No Project) LOS [2]	Near Term 2021 With Project (400 students) Delay [1]	Near Term 2021 With Project (400 students) LOS [2]	Near Term 2021 With Project (400 students) Change in Delay [3]	Near Term 2021 With Project (400 students) With Mitigations Delay [1]	Near Term 2021 With Project (400 students) With Mitigations LOS [2]	Near Term 2021 With Project (400 students) With Mitigations Change in Delay [3]
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches) /CMP	D	AM	**827.3** [4]	**F**	**899.5** [4]	**F**	**72.2**	**621.9** [4]	**F**	**-205.4**
	SB Critical Delay					***273.8*** [4]	***F***	***273.8*** [4]	***F***	***0.0***	***74.2***	***E***	***-199.6***
	WB Critical Delay					*54.0*	*D*	*54.0*	*D*	*0.0*	*54.0*	*D*	*0.0*
					PM	**748.5** [4]	**F**	**770.3** [4]	**F**	**21.8**	**505.4** [4]	**F**	**-243.1**
	SB Critical Delay					***61.8***	***E***	***61.8***	***E***	***0.0***	***61.8***	***E***	***0.0***
	WB Critical Delay					***65.1***	***E***	***65.1***	***E***	***0.0***	***65.1***	***E***	***0.0***
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	C	AM	**3057.3** [4]	**F**	**10000.0** [4]	**F**	**6942.8**	6.1	A	-3051.2
					PM	15.4	C	16.2	C	0.8	4.0	A	-11.4
3	US-101 NB Ramps and Marsh Road	Signal	State	D	AM	**139.2** [4]	**F**	**158.6** [4]	**F**	**19.4**	**95.7**	**F**	**-43.5**
					PM	**104.6** [4]	**F**	**111.9** [4]	**F**	**7.3**	**95.4**	**F**	**-9.2**
4	US-101 SB Ramps and Marsh Road	Signal	State	D	AM	**95.2**	**F**	**104.1**	**F**	**8.9**	**No Feasible Mitigation**		
					PM	**140.2** [4]	**F**	**146.4** [4]	**F**	**6.2**			
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local approaches)	D	AM	30.3	C	38.3	D	8.0	30.1	C	-0.2
					PM	**95.7**	**F**	**108.8** [4]	**F**	**13.1**	40.7	D	-55.0
	EB Critical Delay					***316.0*** [4]	***F***	***356.2*** [4]	***F***	***40.2***	***61.5***	***E***	***-254.5***
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	C	AM	**40.5**	**E**	**120.9**	**F**	**80.4**	26.9	C	-13.6
					PM	**478.5** [4]	**F**	**540.0** [4]	**F**	**61.5**	**117.6** [4]	**F**	**-360.9**
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	12.1	B	13.8	B	1.6	27.3	C	15.2
					PM	**32.7**	**D**	**65.3**	**F**	**32.6**	24.2	C	-8.5
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	14.6	B	16.1	C	1.5	11.5	B	-3.1
					PM	**29.7**	**D**	**32.1**	**D**	**2.4**	21.9	C	-7.8
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	C	AM	20.1	C	22.9	C	2.9	22.4	C	2.3
					PM	**53.5**	**F**	**63.0**	**F**	**9.5**	**62.7**	**F**	**9.2**
10	Bayfront Expressway and Chilco Street	Signal	State (with local approaches)	D	AM	**64.9**	**E**	**67.6**	**E**	**2.7**	22.6	C	-42.3
	EB Critical Delay					***82.3***	***F***	***82.3***	***F***	***0.0***	***72.5***	***E***	***-9.8***
					PM	**109.6** [4]	**F**	**111.5** [4]	**F**	**1.9**	34.3	C	-75.3
	EB Critical Delay					***590.7*** [4]	***F***	***602.5*** [4]	***F***	***11.8***	***69.5***	***E***	***-521.2***
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	C	AM	**144.5** [4]	**F**	**156.6** [4]	**F**	**12.1**	**46.0**	**D**	**-98.5**
					PM	**299.7** [4]	**F**	**309.6** [4]	**F**	**9.9**	**64.4**	**E**	**-235.3**

Notes:
[1] Delay = average seconds of delay per vehicle for all vehicles at signalized and 4-way stop-controlled intersections, and average worst approach delay for vehicles at 2-way/1-way stop-controlled intersections.
[2] LOS = level of service for the entire intersection at signalized and 4-way stop-controlled intersections, and for the worst approach at 2-way/1-way stop-controlled intersections.
[3] Level of service impact thresholds include a change in the average intersection delay of 23 seconds or more at intersections operating at acceptable levels and a change in all critical movements of 0.8 seconds or more at City of Menlo Park intersections or a change of 0.8 seconds or more on the local approaches' most critical movement at State-controlled intersections operating at substandard levels.
Level of service impact threshold for State intersections operating at unacceptable levels of service (LOS E or F) is the increase of 4 or more seconds to the average intersection delay.
[4] The HCM methodology for intersection analysis does not accurately calculate actual intersection operating conditions once the calculated intersection delay exceeds 100+ seconds. Once an intersection is calculated to operate with delays exceeding 100 seconds, any additional traffic to the intersection will increase the intersection delay exponentially, resulting in unrealistic excessive delays that most likely would never be experienced at an actual intersection. However, for the purpose of quantifying the projected increase in delay due to the proposed project, all calculated delays are reported, including those exceeding 100 seconds.
Entries denoted in **bold** indicate conditions that exceed the City's (and/or Caltrans for the applicable intersections) current level of service standard.
- Denotes significant impact based on City of Menlo Park criteria.
- Denotes significant impact based on Caltrans criteria.

2. Constitution Drive and Independence Drive

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS F during the AM peak hour under both the 2018 and 2021 near term conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the AM peak hour under both the 2018 and 2021 project conditions scenarios. This constitutes a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Mitigation: A potential mitigation measure at this intersection consists of prohibiting the northbound left-turn movement from Constitution Drive to westbound Independence Drive. The traffic volumes projected to make this movement under near term project conditions are less than 10 vehicles during the peak hours, which would be rerouted to the intersection of Chrysler Drive and Constitution Drive. With the elimination of the northbound left-turn movement at this intersection, the intersection is projected to operate at acceptable LOS A during both peak hours under 2021 near-term plus project conditions.

Although the above improvements would reduce to project impact to less than significant, additional comprehensive analysis of this improvement is required in order to determine its feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvement. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*****.**

The above improvement also was identified as a potential mitigation measure for the approved Commonwealth Corporate Center project but its feasibility was not determined (impact was determined significant and unavoidable).

3. US 101 Northbound Ramps and Marsh Road

Impact: This State signalized intersection is projected to operate at unacceptable LOS F during both peak hours under both the 2018 and 2021 near term conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both the AM and PM peak hours under both the 2018 and 2021 project conditions scenarios. This constitutes a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Additionally, based on Caltrans intersection impact criteria, the proposed project is projected to result in an impact at this intersection during both the AM and PM peak hours under the 2021 project conditions scenario (project would increase intersection delay by 4 seconds or more).

Mitigation: A potential mitigation measure at this intersection includes the widening of the northbound off-ramp to include a second northbound right-turn lane. Intersection operations would improve to better than no project conditions with implementation of the second northbound right-turn lane. However, the intersection would continue to operate at unacceptable levels of service during the peak hours under the 2021 project conditions scenario. In order to improve the intersection's level of service to acceptable levels, Marsh Road, and the bridge structure over US 101, would have to be widened from four to six lanes. A project of such magnitude could not feasibly be implemented by a single development project. Additionally, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

The widening of the northbound off-ramp to include a second northbound right-turn lane was identified as a potential mitigation measure for the approved Facebook Campus project. However, the impact was determined significant and unavoidable because the intersection is under the jurisdiction of Caltrans and the City cannot guarantee that the mitigation measure would be implemented.

4. US 101 Southbound Ramps and Marsh Road

Impact: This State signalized intersection is projected to operate at unacceptable LOS F during both peak hours under both the 2018 and 2021 near term conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the AM peak-hour under the 2018 project conditions scenario and during both the AM and PM peak hours under the 2021 project conditions scenario. This constitutes a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Additionally, based on Caltrans intersection impact criteria, the proposed project is projected to result in an impact at this intersection during both the AM and PM peak hours under the 2021 project conditions scenario (project would increase intersection delay by 4 seconds or more).

Mitigation: A potential mitigation measure at this intersection includes the widening of the southbound off-ramp to add a second southbound right-turn lane and converting the existing southbound right-turn lane into a shared left-and-right turn lane. In addition to widening the southbound off-ramp, this improvement would require the widening of Marsh Road in the eastbound direction to provide a third receiving lane. With implementation of the above improvements, the intersection is projected to operate at acceptable levels of service under project conditions. However, an improvement project of such magnitude could not feasibly be implemented by a single development project. Additionally, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

The widening of the southbound off-ramp to add a second southbound right-turn lane and converting the existing southbound right-turn lane into a shared left-and-right turn lane was identified as a potential mitigation measure for the approved Commonwealth Corporate Center project. However, the impact was determined significant and unavoidable due to right-of-way requirements that would be needed for the receiving lane on the Marsh Road bridge over US 101.

5. Bayfront Expressway and Chrysler Drive

Impact: This State-controlled signalized intersection is projected to operate at unacceptable LOS F during the PM peak-hour under both the 2018 and 2021 near term conditions. The proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour under both the 2018 and 2021 project conditions scenarios. This constitutes a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Additionally, based on Caltrans intersection impact criteria, the proposed project is projected to result in an impact at this intersection during the PM peak hour under the 2021 project conditions scenario (project would increase intersection delay by 4 seconds or more).

Improvement: The proposed mitigation measure at this intersection consists of the addition of a third eastbound left-turn lane on Chrysler Drive onto northbound Bayfront Expressway. Implementation of the proposed mitigation would improve intersection operations to acceptable levels during both peak hours under the 2021 project conditions scenario. However, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

The above proposed mitigation measure is included in the City's Traffic Impact Fee (TIF) program recommended intersections improvements. Therefore, payment of the TIF by the project, as stipulated in the TIF ordinance, will be considered mitigation for the project impact at this intersection. Transportation impact fees must be paid in full to the City of Menlo Park before a building permit is issued.

6. Constitution Drive and Chrysler Drive

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS E and F during both peak hours under both the 2018 and 2021 near term conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both peak hours under both the 2018 and 2021 project conditions scenarios. This constitutes a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Mitigation: A potential mitigation measure at this intersection consists of the installation of a traffic signal, the addition of a separate left-turn lane on both approaches of Constitution Drive and the westbound approach on Chrysler Drive, and restriping the eastbound approach to include a share left-and-through and a share right-and-through lane. The traffic signal warrant check showed that this intersection is projected to have traffic volumes that satisfy the CA MUTCD peak-hour warrant (Warrant #3) during the PM peak hour under the 2018 project conditions scenario and during both peak hours under the 2021 project conditions scenario (this is discussed in the following chapter). Implementation of the above improvements would improve the intersection operating conditions to better than no project conditions.

Although intersection operating conditions would improve with the above improvements, the intersection would continue to operate at an unacceptable level of service during the PM peak hour under the 2021 project conditions scenario. Additionally, the decision to install a traffic signal should not be based purely on the signal warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Engineering judgment should be exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak hour warrant, therefore, are subject to further analysis before determining that a traffic signal is necessary. Thus, comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvements. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*.**

The signalization of the intersection, addition of a separate southbound left-turn lane, and the restriping of the shared lanes on the eastbound approach were also identified as mitigation measures for the approved Menlo Gateway project.

7. Jefferson Drive and Chrysler Drive

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS D during the PM peak hour under both the 2018 and 2021 near term conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under both the 2018 and 2021 project conditions scenarios. This constitute a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Mitigation: A potential mitigation measure at this intersection consists of the installation of a traffic signal. The traffic signal warrant check showed that this intersection is projected to have traffic volumes that satisfy the CA MUTCD peak-hour warrant (Warrant #3) during the PM peak hour under the 2021 project conditions scenario (this is discussed in the following chapter). Signalizing the intersection would improve the intersection operating conditions to acceptable levels during both peak hours under project conditions.

Although the above improvements would reduce to project impact to less than significant, the decision to install a traffic signal should not be based purely on the signal warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Engineering judgment should be exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak hour warrant, therefore, are subject to further analysis before determining that a traffic signal is necessary. Thus, comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvements. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable***.

Installation of a traffic signal at this intersection was identified as a potential mitigation measure for the approved Commonwealth Corporate Center project but its feasibility was not determined (impact was determined significant and unavoidable).

8. Independence Drive and Chrysler Drive

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS D during the PM peak hour under both the 2018 and 2021 near term conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under the 2021 project conditions scenario only. This constitute a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Mitigation: A potential mitigation measure at this intersection consists of the addition of a separate left-turn lane on the southbound direction on Independence Drive and a separate right-turn lane on the westbound direction on Chrysler Drive. Implementation of the above improvements would improve the intersection operating conditions to acceptable levels during both peak hours under the 2021 project conditions scenario.

Although the above improvements would reduce to project impact to less than significant, additional comprehensive analysis of this improvement is required in order to determine its feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvement. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable***.

The above improvement, in addition to installation of a traffic signal, were identified as a potential mitigation measure for the approved Commonwealth Corporate Center project but its feasibility was not determined (impact was determined significant and unavoidable).

9. Constitution Drive and Jefferson Drive

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS E and F during the PM peak hour under the 2018 and 2021 near term conditions, respectively. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under the 2021 project conditions scenario only. This constitute a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Improvement: A potential mitigation measure at this intersection consists of the addition of a separate left-turn lane on the northbound approach on Constitution Drive. Implementation of the above improvements would improve the intersection operating conditions; however, the intersection would continue to operate at unacceptable level of service during the PM peak hour. There are no further feasible improvements available at this intersection. Therefore, the project impact at this intersection is deemed ***significant and unavoidable*****.**

10. Bayfront Expressway and Chilco Street

Impact: This State-controlled signalized intersection is projected to operate at unacceptable LOS F during the PM peak-hour under both the 2018 and 2021 near term conditions. The proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour under both the 2018 and 2021 project conditions scenarios. This constitute a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Improvement: A potential mitigation measure at this intersection includes the addition of a second eastbound left-turn lane on Chilco Drive and converting the existing eastbound left-turn lane into a shared left-and-right turn lane. With implementation of the above improvements, the intersection is projected to operate at acceptable levels of service during both peak hours under the 2021 project conditions scenario.

Although intersection operating conditions would improve with the above improvements, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

The addition of a second eastbound left-turn lane on Chilco Drive was identified as a project impact potential mitigation measure for the approved Menlo Gateway project.

11. Constitution Drive and Chilco Street

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS F during both peak hours under both the 2018 and 2021 near term conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both peak hours under both the 2018 and 2021 project conditions scenarios. This constitute a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Improvement: A potential mitigation measure at this intersection consists of the installation of a traffic signal and the addition of a separate left-turn lane on the southbound, eastbound, and westbound approaches and a separate right-turn lane on the northbound approach on Constitution Drive. The traffic signal warrant check showed that this intersection is projected to have traffic volumes that satisfy the CA MUTCD peak-hour warrant (Warrant #3) during the PM peak hour under the 2018 project conditions scenario and during both peak hours under the 2021 project conditions scenario (this is discussed in the following chapter). Implementation of the above intersection would improve the intersection operating conditions to better than no project conditions; However, the intersection would continue to operate at an unacceptable level of service during both peak hours.

Although intersection operating conditions would improve with the above improvements, the decision to install a traffic signal should not be based purely on the signal warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Engineering judgment should be exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak hour warrant, therefore, are subject to further analysis before determining that a traffic signal is necessary. Thus, comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvements. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*****.**

The addition of a separate southbound left-turn lane at this intersection was identified as a potential mitigation measure for the approved Commonwealth Corporate Center project.

A summary of the potential mitigation measures described above is presented in Table 25.

City of Menlo Park Traffic Impact Fee Program

The City of Menlo Park Traffic Impact Fee program was initiated with the purpose of developing a transportation impact fee (TIF) to help fund the transportation improvements that will be needed as development occurs in Menlo Park. This funding source links future development to identified roadway network improvements needed to maintain adequate service levels and is intended to allocate costs of development-related roadway improvements. The traffic impact fees ensure that new development and redevelopment within the City pays a proportional fair share contribution for the cost of new transportation infrastructure that is deemed necessary and reasonably related to accommodating the impact of new development within the City.

New development and redevelopment are subject to the TIFs. The TIFs may only be used for building new arterial streets, sidewalks, bicycle lanes, and other physical improvements to the City's multi-modal transportation network. All fees are paid in full to the City of Menlo Park before a building permit is issued. The TIF amount that development projects are subject to is determined, as stipulated by City ordinance (#964, Municipal Code Section 13.26), based on the project's PM peak hour trip generation. A set fee amount per PM peak hour trip, or per unit for specific land uses described in the *City of Menlo Park Traffic Impact Fee Program* document, dated August 2009 , must be paid by development projects to offset their project's impacts to the Citywide transportation network. The TIFs are adjusted annually, based on the ENR Construction Cost Index percentage for San Francisco.

By paying the TIF, a development project will have contributed their "fair share" to mitigate their project's impacts to the Citywide transportation system. However, if the development is also determined to result in an impact to specific roadway network facilities, in addition to the TIF, the development project may be conditioned to provide local transportation and streetscape improvements to mitigate the identified project impacts.

Table 25
Summary of Potential Mitigation Measures

Study Number	Intersection	Existing Intersection Control	Jurisdiction	Proposed Project Mitigation	Proposed Mitigation by Approved Development Projects[1]		Mitigation/Project Impact Status
					Mitigation	Project	
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches)/CMP	Restripe SB thru to shared T/R lane Add 3rd EB RT lane	Restripe SB thru to shared T/R lane Add 3rd EB RT lane	St. Anton Development Commonwealth Corporate Center	Caltrans facility; Project impact deemed **significant and unavoidable**
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	Prohibit NB LT from Constitution Drive	Prohibit NB LT from Constitution Drive	Commonwealth Corporate Center	Feasibility must be investigated; Project impact deemed **signficant and unavoidable**
3	US-101 NB Ramps and Marsh Road	Signal	State	Add additional NB RT Lane from NB off-ramp	Add additional NB RT Lane from NB off-ramp	Facebook Campus	Caltrans facility; Project impact deemed **significant and unavoidable**
4	US-101 SB Ramps and Marsh Road	Signal	State	No Feasible Mitigation	No Feasible Mitigation		No Feasible Mitigation
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local approaches)	Add third EB LT lane from Chrysler Drive	Restripe existing EB RT as shared LT/RT lane (already exists)	Facebook Campus	Caltrans facility; Project impact deemed **significant and unavoidable**
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	Signal + separate SB, NB, and WB LT lane + shared EB LT/TH and RT/Th lanes	Signal + separate SB + shared EB LT/TH and RT/Th lanes	Menlo Gateway	Feasibility must be investigated; Project impact deemed **signficant and unavoidable**
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	Signal	Pedestrian improvements + fair share contribution towards future improvement of intersection	Commonwealth Corporate Center	Feasibility must be investigated; Project impact deemed **signficant and unavoidable**
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	Separate SB LT lane + separate WB RT lane	Pedestrian improvements + fair share contribution towards future improvement of intersection	Commonwealth Corporate Center	Feasibility must be investigated; Project impact deemed **signficant and unavoidable**
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	Separate NB LT lane on Constitution Drive	None		Feasibility must be investigated; Project impact deemed **signficant and unavoidable**
10	Bayfront Expressway and Chilco Street	Signal	State (with local approaches)	Add second EB LT lane and convert existing LT lane to shared LT/RT lane	Add second EB LT lane	Menlo Gateway	Caltrans facility; Project impact deemed **significant and unavoidable**
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	Signal + separate SB, EB, & WB LT lanes + separate NB RT lane	Add separate SB LT on Constitution Drive	Commonwealth Corporate Center	Feasibility must be investigated; Project impact deemed **signficant and unavoidable**

Notes:
[1] Source:
Commonwealth Corporate Center Project Draft Environmental Impact Report (EIR) and Facebook Campus Project EIR

Near Term Plus Project Roadway Segment Analysis

The results of the roadway segment analysis under near term plus project conditions are summarized in Table 26. The results of the analysis show that four study roadway segments are projected to have traffic volumes that exceed their acceptable capacities. In addition, increases in daily traffic volumes associated with the proposed school project are projected to meet the potential impact criteria for the same four study roadway segments. Therefore, based on City of Menlo Park potential impact criteria for roadway segments, the proposed project would result in a potentially significant impact at the following roadway segments:

1. Jefferson Drive, south of Chrysler Drive
2. Chrysler Drive, between Jefferson Drive and Constitution Drive
3. Chrysler Drive, between Constitution Drive and Bayfront Expressway
4. Independence Drive, north of Chrysler Drive

The study roadway segments of Jefferson Drive, Chrysler Drive (between Jefferson Drive and Constitution Drive), and Independence Drive are classified as local streets (which tend to have lower traffic thresholds that are more typical of residential areas) although they are located in an industrial area. If these three roadway segments would be classified as collector roadways, they would have traffic volumes within their designated capacities and they would not be impacted by the project. The evaluation of these three segments, therefore, represents a conservative analysis.

The roadway segment of Chrysler Drive, between Constitution Drive and Bayfront Expressway, is projected to carry the most traffic out of all the study roadway segments under near term conditions.

Possible Roadway Improvements

Typical roadway network improvements focus in adding capacity to the facility in order to serve the projected increased in traffic volumes. However, the potential impacts to the above roadway segment are based on a designated daily traffic volume limit for the facility, which would not change with the addition of capacity to the roadway. In addition, increasing the capacity of the above roadways would require right-of-way acquisition, which would affect adjacent property owners and is considered unfeasible. Widening of roadways also could lead to other negative effects, such as induced travel demand (more people would be willing to drive rather than taking alternative transportation modes as a result of the increase roadway capacity), reduction in the use of alternative transportation modes, air quality degradation, increase in noise, and reduced safety for pedestrians and bicyclists (due to wider roadways and increased traffic volumes). Therefore, potential impacts on the above roadways are deemed ***significant and unavoidable***.

Although there are no feasible improvements to mitigate the potential roadway segment impacts, other possible improvements and efforts could be implemented to reduce the amount of project traffic added to the roadway segments. The improvements include the following:

- The project could contribute to the completion of planned bicycle facilities in the project area in an effort to encourage more students to bike to school. The City of Menlo Park *Comprehensive Bicycle Development Plan* identifies Class III bike routes along Constitution Drive. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.
- The project could contribute to the completion of planned sidewalk projects in the area that would close existing gaps in the sidewalk network and provide a continuous network connecting the project site to the adjacent neighborhoods. The City of Menlo Park *Sidewalk Master Plan* has identified the entire length of Jefferson Drive, as well as segments of Chrysler Drive, Constitution Drive, and Chilco Street, as priority (high ranking) streets for the installation of missing sidewalks. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within

Table 26
Near Term Plus Project Conditions Roadway Segment Analysis Results

	Roadway Segment	Classification	Capacity	Near Term ADT	ADT Project Trips	Near Term Plus Project	% Change from Near-Term	Potentially Significant Impact[1]
1	Jefferson Drive, south of Chrysler Drive	Local	1,500	**2,330**	**388**	**2,718**	16.7%	**Yes**
2	Chrysler Drive, between Jefferson Drive and Constitution Drive	Local	1,500	**8,370**	**350**	**8,720**	4.2%	**Yes**
3	Chrysler Drive, between Constitution Drive and Bayfront Expressway	Collector	10,000	**13,670**	**311**	**13,981**	2.3%	**Yes**
4	Independence Drive, north of Chrysler Drive	Local	1,500	**5,740**	**39**	**5,779**	0.7%	**Yes**
5	Constitution Drive, between Jefferson Drive and Chilco Street	Collector	10,000	5,410	60	5,470	1.1%	No
6	Chilco Street, between Constitution Drive and Bayfront Expressway	Collector	10,000	8,990	28	9,018	0.3%	No

Notes:
ADT = Average Daily Traffic
Roadway segment classification, capacity, and existing ADT information obtained from the *Circulation Existing Conditions* Report (City of Menlo Park General Plan), January 2015, with the exception of segments #1 and #4.
[1] The City of Menlo Park identifies the following roadway segment capacity thresholds as potential impact criteria:
Local Street - Potential impact if ADT is >1,350 vehicles and project adds >25 trips, or ADT is >750 and project increases ADT by 12.5%, or ADT is <750 and project increases ADT by 25%.
Collector Street - Potential impact if ADT is >9,000 vehicles and project adds >50 trips, or ADT is >5,000 and project increases ADT by 12.5%, or ADT is <5,000 and project increases ADT by 25%.
Bold indicates ADT values that exceed the acceptable capacity.

the study area.

- The City of Menlo Park, in conjunction with SamTrans, should consider adding bus services to directly serve the project area.
- The project should encourage students to walk, ride their bike, or take public transportation to school in an effort to reduce the amount of traffic generated by the proposed project.

Near Term Plus Project Routes of Regional Significance Analysis

The results of the routes of regional significance analysis under near term plus project conditions are summarized in Table 27. The results of the analysis shows that all directional roadway segments analyzed, with the exception of the northbound direction of the segment of Bayfront Expressway, from Willow Road to US 101, are projected to continue to operate within the segments' level of service standard.

The segment of Bayfront Expressway, northbound direction from Willow Road to US 101, is projected to operate at unacceptable LOS E during the AM peak hour under near term conditions. The proposed project is projected to add traffic to this segment representing less than four percent (4%) of the segment's capacity. Therefore, based on CMP impact criteria, the proposed project would have an impact at this study route of regional significance.

Possible Route of Regional Significance Improvements

Typical roadway improvements consist in the widening of the roadway to add travel lanes and capacity to serve the projected increased in traffic volumes. However, the study Routes of Regional Significance are under the jurisdiction of Caltrans and the City has no authority over the implementation of improvements. Additionally, an improvement project of such magnitude could not feasibly be implemented by a single development project. Freeway and other state roadway projects are planned and funded on a regional scale. Therefore, potential impacts on the above Route of Regional Significance are deemed ***significant and unavoidable***.

Table 27
Near Term Plus Project Conditions Routes of Regional Significance Analysis Results

Route	Segment	Direction	LOS Standard[1]	Capacity[2]	Peak Hour	Near Term Total Volume	Near Term V/C	Near-Term Plus Project Net Project Trips	Near-Term Plus Project Total Volume	Near-Term Plus Project V/C	Near-Term Plus Project LOS	Near-Term Plus Project Project % of Capacity
US 101	North of Marsh Road	NB	F	9,200	AM	7,042	0.765	44	7,086	0.770	D	0.5%
				9,200	PM	6,964	0.757	29	6,993	0.760	D	0.3%
	North of Marsh Road	SB	F	9,200	AM	8,758	0.952	53	8,811	0.958	E	0.6%
				9,200	PM	8,062	0.876	24	8,086	0.879	E	0.3%
US 101	South of Marsh Road	NB	F	9,200	AM	6,996	0.760	35	7,031	0.764	D	0.4%
				9,200	PM	6,336	0.689	16	6,352	0.690	D	0.2%
	South of Marsh Road	SB	F	9,200	AM	7,868	0.855	29	7,897	0.858	E	0.3%
				9,200	PM	7,849	0.853	19	7,868	0.855	E	0.2%
Bayfront Expressway (SR 84)	from Willow Road (SR 114) to US 101	NB	D	3,300	AM	**3,012**	**0.913**	**125**	**3,137**	**0.951**	**E**	**3.8%**
				3,300	PM	2,689	0.815	82	2,771	0.840	D	2.5%
	from US 101 to Willow Road (SR 114)	SB	D	3,300	AM	2,158	0.654	91	2,249	0.682	B	2.8%
				3,300	PM	2,635	0.798	41	2,676	0.811	D	1.2%

Notes:
V/C = Volume to Capacity Ratio; LOS = Level of Service.
[1] Level of service standards as defined in the C/CAG *LOS and Performance Measure Monitoring Report* , 2015.
[2] The *Highway Capacity Manual* identifies capacity values for freeway segments with six or more lanes as 2,300 vehicles per hour per lane (vphpl); the capacity for four-lane freeway segments is identified as 2,200 vphpl.
Arterial capacity is estimated to be 1,100 vphpl, based on a saturation flow rate of 1,900 vphpl and assuming the arterial facility receives 60 percent of the green time.
Bold indicates segment operating at substandard levels of service.
- Denotes potential significant project impact.

Although there are no feasible improvements to mitigate the potential Routes of Regional Significance impacts, other possible improvements and efforts could be implemented to reduce the amount of project traffic added to these roadway segments. The improvements include the following:

- The project could contribute to the completion of planned bicycle facilities in the project area in an effort to encourage more students to bike to school. The City of Menlo Park *Comprehensive Bicycle Development Plan* identifies Class III bike routes along Constitution Drive. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.
- The project could contribute to the completion of planned sidewalk projects in the area that would close existing gaps in the sidewalk network and provide a continuous network connecting the project site to the adjacent neighborhoods. The City of Menlo Park *Sidewalk Master Plan* has identified the entire length of Jefferson Drive, as well as segments of Chrysler Drive, Constitution Drive, and Chilco Street, as priority (high ranking) streets for the installation of missing sidewalks. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.
- The City of Menlo Park, in conjunction with SamTrans, should consider adding bus services to directly serve the project area.
- The project should encourage students to walk, ride their bike, or take public transportation to school in an effort to reduce the amount of traffic generated by the proposed project.

Near Term Plus Project Freeway Ramp Analysis

Table 28 shows the projected near term plus project ramp volumes and levels of service during the peak hours.

Based on the calculated V/C ratios, the following freeway ramps were projected to operate at substandard levels under near term project conditions, based on Caltrans standards:

Northbound on-ramp from westbound Marsh Road (LOS F – AM & PM peak hours)
Southbound on-ramp from westbound Marsh Road (LOS E - PM peak hour)

Based on Caltrans impact criteria, the proposed project would have an impact at the above freeway ramps since it would add traffic to a facility operating at substandard levels. The proposed project would add traffic to the above ramps representing no more than 5% of the ramps' capacity.

The remainder of the study interchange ramps are projected to operate at acceptable levels.

Possible Freeway Ramp Improvements

In order to improve the level of service conditions to acceptable levels at the study freeway ramps that are projected to be deficient under near term plus project conditions, the following measures can be implemented:

- Increase capacity on the deficient freeway ramps – This can be accomplished by providing a higher service rate (increase meter rate) at the metered on-ramps. However, this is a State facility and the City has no authority over its operations or improvements.
- Reduce project traffic on the deficient freeway ramps – Project traffic using the impacted freeway on-ramps could use alternative routes. However, it is possible that the displaced project traffic could have a negative impact at other facilities.

Table 28
Near Term Plus Project Conditions Freeway Ramp Analysis Results

					Near-Term Conditions					Near-Term Plus Project Conditions						
Interchange/Ramp	Ramp Type	Existing Control Type	Peak Hour	Ramp Capacity (vph)[1]	Total Volume	Mixed-flow Volume (vph)[2]	HOV Volume (vph)[3]	V/C [4]	LOS [4]	Total Volume	Project Trips	Mixed-flow Volume (vph)[2]	HOV Volume (vph)[3]	V/C [4]	LOS [4]	Project's % of Capacity
US 101 at Marsh Road																
NB off-ramp to Marsh Rd	Diagonal	Signal	AM	2,000	1,553	1,553	N/A	0.777	C	1,588	35	1,588	N/A	0.794	C	1.8%
		Signal	PM	2,000	1,106	1,106	N/A	0.553	A	1,120	14	1,120	N/A	0.560	A	0.7%
NB on-ramp from WB Marsh Rd	Diagonal	Meter	AM	900	**2,238**	**1,679**	**560**	**1.865**	**F**	**2,282**	**44**	**1,712**	**571**	**1.902**	**F**	4.9%
		Meter	PM	900	**1,281**	**897**	**384**	**0.996**	**E**	**1,310**	**29**	**917**	**393**	**1.019**	**F**	3.2%
SB off-ramp to Marsh Rd	Diagonal	Signal	AM	4,000	2,116	2,116	N/A	0.529	A	2,169	53	2,169	N/A	0.542	A	1.3%
		Signal	PM	4,000	1,841	1,841	N/A	0.460	A	1,865	24	1,865	N/A	0.466	A	0.6%
SB on-ramp from WB Marsh Rd	Loop	Meter	AM	900	305	305	N/A	0.339	A	334	29	334	N/A	0.371	A	3.2%
		Meter	PM	900	**791**	**791**	**N/A**	**0.879**	**D**	**810**	**19**	**810**	**N/A**	**0.900**	**E**	2.1%

Notes:

[1] Typical capacity for diagonal ramps is 2,000 vehicles per hour per lane (vphpl).
The capacity for non-metered ramps is determined based on the number of lanes at the ramp's constraint point.
The capacity for metered on-ramps was assumed to be 900 vphpl for mixed-flow lane ramps, regardless of the number of lanes.
At ramps that include HOV lanes, the analysis is based on the mixed-flow lane(s) ONLY.

[2] Existing ramp count data provided by Caltrans and consists of 2015 counts.

[3] HOV traffic volumes at the northbound on-ramp from westbound Marsh Road was assumed to be 25% and 30% of total traffic volume during the AM and PM peak hour, respectively, based on the percentage of HOV traffic on the freeway mainline.

[4] The calculated volume-to-capacity (V/C) ratio at the northbound on-ramp from westbound Marsh Road corresponds to the mixed-flow traffic volumes and capacity ONLY (the HOV lane is projected to operate adequately). The ramp level of service corresponds to the calculated ramp V/C ratios.

Bold indicates substandard level of service conditions, based on Caltrans level of service standard of LOS C or better.

☐ - Denotes potential project impact.

6.
Cumulative Conditions

This chapter presents a summary of the traffic conditions that would occur under cumulative conditions, without and with the proposed project. Cumulative conditions represent long-term traffic projections on the future transportation network. As stipulated by the City of Menlo Park *Transportation Impact Analysis Guidelines*, impacts of the project under cumulative conditions were evaluated for a span of ten years from existing conditions (year 2024).

Transportation Network Under Cumulative Conditions

Various intersection improvements are planned in the study area. These improvements are required mitigation measures for approved projects in the study area (Commonwealth Corporate Center, Facebook Campus, and Menlo Gateway projects). The planned improvements include the following:

3. US 101 NB Ramps and Marsh Road. The planned improvements at this intersection include widening the freeway northbound off-ramp to include a second northbound right-turn lane. This improvement is required mitigation measure for the Facebook Campus project.

6. Constitution Drive and Chrysler Drive. The planned improvements at this intersection include the installation of a traffic signal, and the restriping of the southbound approach on Constitution Drive to include a separate left-turn lane and the eastbound approach on Chrysler Drive to include one shared left-and-through and one shared right-and-through lane. These improvements are required mitigation measure for the Menlo Gateway project.

10. Bayfront Expressway and Chilco Street. The planned improvements at this intersection include widening of the eastbound approach on Chilco Street to include a second left-turn lane. This improvement is required mitigation measure for the Menlo Gateway project.

11. Constitution Drive and Chilco Street. The planned improvements at this intersection include the restriping of the southbound approach on Constitution Drive to include a separate left-turn lane. This improvement is required mitigation measure for the Commonwealth Corporate Center project.

In addition to the above physical intersection improvements, the Commonwealth Corporate Center project is planning to implement partial mitigation measures at the intersections of ***Jefferson Drive/Chrysler Drive*** (intersection #7) and ***Independence Drive/Chrysler Drive*** (intersection #8) as well as contribute a fair share contribution toward the future improvement of these intersections. The future improvement could possibly include the installation of a traffic signal or other traffic control devices such as roundabouts or traffic circles. The partial mitigation measures include the installation of sidewalks along segments segment of Jefferson and Chrysler Drives with missing sidewalks and installation of crosswalks and Americans with Disabilities Act (ADA)-compliant pedestrian curb ramps across specific legs of the intersections.

Although the above plan mitigation improvements most likely will be in place under cumulative conditions, it is unknown when or if the proposed mitigation measures will be implemented, in particular those proposed at Caltrans intersections, where the City has no authority over the intersection. For this reason, the roadway network under cumulative conditions was conservatively assumed to be the same as the existing conditions roadway network.

Cumulative Conditions Traffic Volumes

Cumulative conditions traffic volumes were estimated by adding to existing peak hour volumes the estimated traffic from approved and pending projects in the City of Menlo Park. Approved and pending project information was obtained from the City of Menlo Park in the form of a list and includes all projects in Menlo Park that were approved or the City had knowledge of at the time the proposed project's Notice of Preparation (NOP) was released. The list of approved projects was presented in the Near Term Conditions chapter (Chapter 4, Table 16). The list of pending projects is summarized in Table 29 below.

Project trip assignment for potential projects was derived based on the three-step process (trip generation, distribution, and assignment) described earlier in this report.

Additionally, a one percent (1%) per year growth factor also was applied to the existing traffic counts over a period of ten years, as stipulated by the City of Menlo Park *Transportation Impact Analysis Guidelines*. The 1% per year growth in the ambient traffic conservatively represents regional growth not reflected by the approved/potential projects in the City and it is consistent with the C/CAG model regional growth projections.

The peak hour cumulative with project traffic volumes are shown on Figure 17. Traffic volumes for all components of traffic are tabulated in Appendix A.

Intersection LOS Under Cumulative Conditions

Intersection levels of service were evaluated against City of Menlo Park and Caltrans Level of Service standards. The results of the level of service analysis under cumulative conditions are summarized in Table 30.

It should be noted that some of the calculated intersection delays are unrealistically excessive delays that most likely would never be experienced at an intersection (drivers tend to look for alternative routes, or different times to travel, when long delays are experienced at an intersection). This is the result of the limitations of the HCM methodology equations, which will calculate inaccurate intersection operating conditions/delays once the calculated delay exceeds more than 100 seconds (LOS F conditions). Once the intersection is calculated to operate with delays exceeding 100+ seconds, any additional traffic added to the intersection increases the intersection delay exponentially, resulting in unrealistic delays. Thus, the effect that 10 additional trips would have at an intersection operating with an average delay of 100 seconds, for example, would be much greater than the effect the same 10 trips would have at an intersection operating with an average delay of 20 seconds. Nevertheless, all intersection delays are reported for the purpose of quantifying the projected increase in delay due to the proposed project.

City of Menlo Park Intersections

The results of the level of service analysis show that, measured against the City of Menlo Park level of service policy, all of the signalized study intersection are projected to operate at unacceptable levels of service during at least one of the peak hours under cumulative conditions.

The proposed 400-student school project is projected to satisfy the applicable City of Menlo Park intersection impact criteria at the following study intersections:

Table 29
List of Potential Projects in the City of Menlo Park

Project Name Project address	Type of Use	Size	Units of Measure	Status
333 Ravenswood Ave	R&D Campus	3,000	employees	Pending
SRI	R&D Campus	-1,780	employees	
500 El Camino Real	Residential	170	du	Pending
	Office	199,500	sf	
(Stanford)	Retail	10,000	sf	
	Auto Dealer (Tesla)	-27,932	sf	
	Auto Dealer (Vacant)		sf	
840 Menlo Ave	Residential	3	du	Pending
	Office	6,936	sf	
1295 El Camino Real	Residential	15	du	Pending
	Office/Retail/Service	1,906	sf	
	Office/Retail/Service	-6,471	sf	
133 Encinal Ave	Residential	24	du	Pending
Roger Reynolds	Retail	-6,166	sf	
1300 El Camino Real	Residential	202	du	Pending
	Office	210,000	sf	
	Retail	7,000	sf	
Greenheart	Dance Studio	-3,800	sf	
	Fast Food Restaurant	-1,200	sf	
	Hardware Storage	-5,000	sf	
1020 Alma St	Office	25,004	sf	Pending
Lane Partners	Retail	-10,272	sf	
	Retail	172	sf	
650-660 Live Oak Ave	Office	16,811	sf	Pending
	Residential	17	du	
Minkoff Group	Residential	-2	du	
	Office	-5,996	sf	
New Magnate High School	School	400	students	Pending
150 Jefferson Dr	Light Industrial	-47,434	sf	
	R&D	113,382	sf	Pending
	Warehouse	61,338	sf	
1315 O'Brien Dr	Manufacturing	45,796	sf	
	Office	-56,002	sf	
	Warehouse	-162,839	sf	
1400 El Camino Real	Hotel	63	rooms	Pending
Hotel	Hotel	33,713	sf	
	Gas Station	-1,932	sf	
Facebook Expansion Project	Office	962,400	sf	Pending
	Hotel	200	rooms	
301-306 Constitution Dr	Manufacturing	-431,698	sf	
	R&D	-86,121	sf	
	Office	-318,019	sf	
ConnectMenlo	Office	2,100,000	sf	Pending
	Life Science	4,500	du	
General Plan & M-2 Update	Retail			
	Hotel	400	rooms	

Source: City of Menlo Park, June 18, 2015.

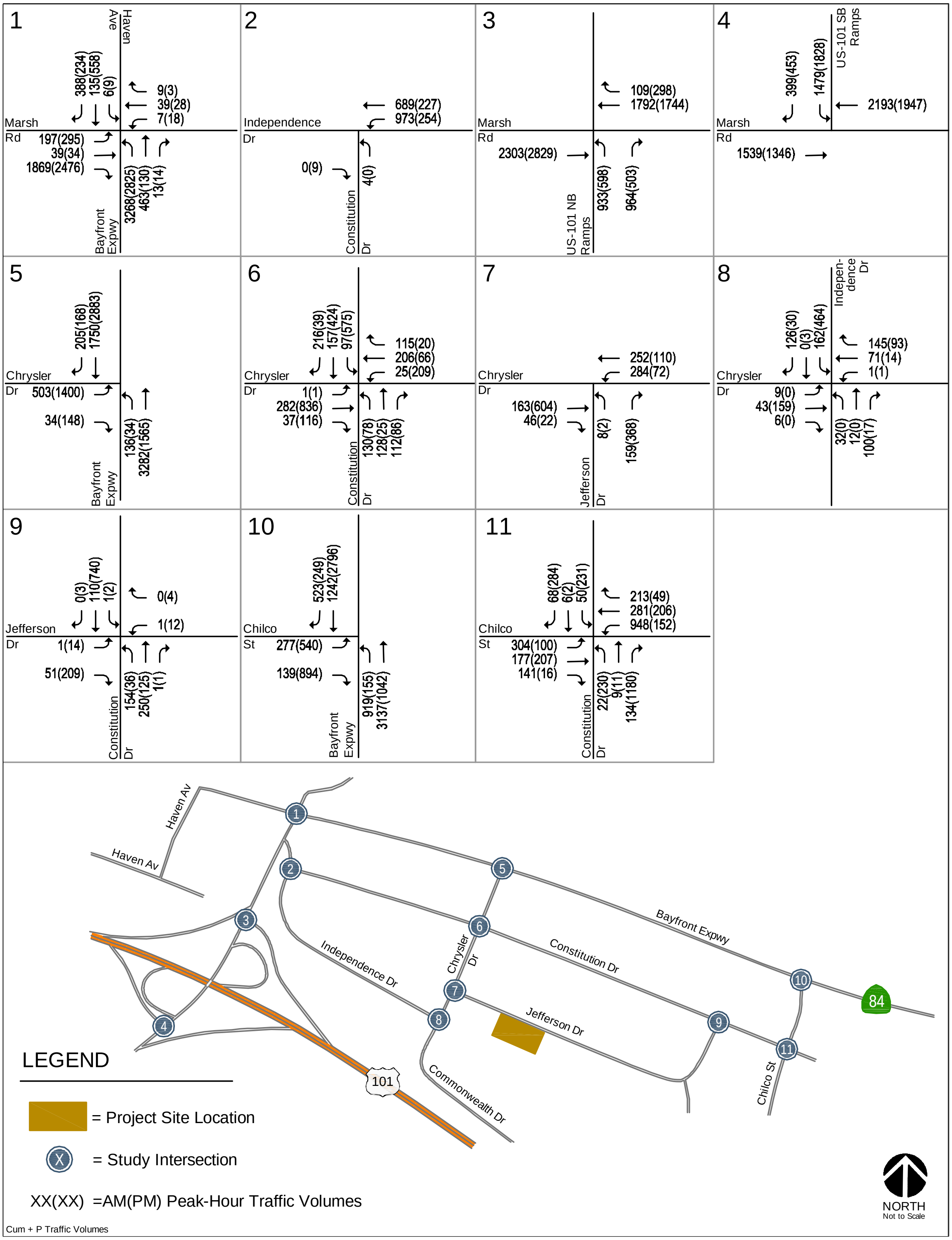

Figure 17
Cumulative Plus Project Traffic Volumes

Table 30
Cumulative Conditions Intersection Levels of Service

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Cumulative (No Project)		Cumulative with Project (400 students)		
						Delay [1]	LOS [2]	Delay [1]	LOS [2]	Change in Delay [3]
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches)/ CMP	D	AM	1009.1 [4]	F	1083.2 [4]	F	74.1
	SB Critical Delay					*282.8* [4]	*F*	*282.8* [4]	*F*	*0.0*
	WB Critical Delay					*54.0*	*D*	*54.0*	*D*	*0.0*
					PM	797.6 [4]	F	819.8 [4]	F	22.2
	SB Critical Delay					*62.8*	*E*	*62.8*	*E*	*0.0*
	WB Critical Delay					*65.2*	*E*	*65.2*	*E*	*0.0*
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	C	AM	4266.2 [4]	F	10000.0 [4]	F	5733.8
					PM	15.6	C	16.4	C	0.8
3	US-101 NB Ramps and Marsh Road	Signal	State	D	AM	167.1 [4]	F	187.8 [4]	F	20.7
					PM	115.2 [4]	F	122.5 [4]	F	7.3
4	US-101 SB Ramps and Marsh Road	Signal	State	D	AM	108.4 [4]	F	118.4 [4]	F	10.0
					PM	163.2 [4]	F	169.8 [4]	F	6.6
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local approaches)	D	AM	30.3	C	38.2	D	7.9
					PM	95.2	F	107.6 [4]	F	12.4
	EB Critical Delay					*322.1* [4]	*F*	*361.9* [4]	*F*	*39.7*
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	C	AM	44.9	E	125.8	F	80.9
					PM	492.1 [4]	F	554.6 [4]	F	62.5
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	12.4	B	14.1	B	1.7
					PM	34.2	D	69.5	F	35.4
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	14.7	B	16.3	C	1.6
					PM	30.8	D	33.6	D	2.8
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	C	AM	20.2	C	23.0	C	2.9
					PM	58.0	F	69.8	F	11.8
10	Bayfront Expressway and Chilco Street	Signal	State (with local approaches)	D	AM	182.6 [4]	F	186.9 [4]	F	4.3
	EB Critical Delay					*106.0* [4]	*F*	*106.0* [4]	*F*	*0.0*
					PM	276.1 [4]	F	278.5 [4]	F	2.4
	EB Critical Delay					*1234.5* [4]	*F*	*1244.6* [4]	*F*	*10.2*
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	C	AM	514.8 [4]	F	537.5 [4]	F	22.7
					PM	785.4 [4]	F	789.6 [4]	F	4.2

Table 30 (Continued)
Cumulative Conditions Intersection Levels of Service

					Cumulative (No Project)		Cumulative with Project (400 students)		
Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Delay [1]	LOS [2]	Delay [1]	LOS [2]	Change in Delay [3]

Notes:

[1] Delay = average seconds of delay per vehicle for all vehicles at signalized and 4-way stop-controlled intersections, and average worst approach delay for vehicles at 2-way/1-way stop-controlled intersections.

[2] LOS = level of service for the entire intersection at signalized and 4-way stop-controlled intersections, and for the worst approach at 2-way/1-way stop-controlled intersections.

[3] Level of service impact thresholds include a change in the average intersection delay of 23 seconds or more at intersections operating at acceptable levels and a change in all critical movements of 0.8 seconds or more at City of Menlo Park intersections or a change of 0.8 seconds or more on the local approaches' most critical movement at State-controlled intersections operating at substandard levels.
Level of service impact threshold for State intersections operating at unacceptable levels of service (LOS E or F) is the increase of 4 or more seconds to the average intersection delay.

[4] The HCM methodology for intersection analysis does not accurately calculate actual intersection operating conditions once the calculated intersection delay exceeds 100+ seconds. Once an intersection is calculated to operate with delays exceeding 100 seconds, any additional traffic to the intersection will increase the intersection delay exponentially, resulting in unrealistic excessive delays that most likely would never be experienced at an actual intersection. However, for the purpose of quantifying the projected increase in delay due to the proposed project, all calculated delays are reported, including those exceeding 100 seconds.

Entries denoted in **bold** indicate conditions that exceed the City's (and/or Caltrans for the applicable intersections) current level of service standard.

- Denotes significant impact based on City of Menlo Park criteria.
- Denotes significant impact based on Caltrans criteria.

2. Constitution Drive and Independence Drive - (Impact - AM peak hour)
3. US 101 NB Ramps and Marsh Road - (Impact - AM & PM peak hours)
4. US 101 SB Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
6. Constitution Drive and Chrysler Drive - (Impact - AM & PM peak hours)
7. Jefferson Drive and Chrysler Drive - (Impact - PM peak hour)
8. Independence Drive and Chrysler Drive - (Impact - PM peak hour)
9. Constitution Drive and Jefferson Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - PM peak hour)
11. Constitution Drive and Chilco Street - (Impact - AM & PM peak hours)

Caltrans Intersections

The results of the level of service analysis show that, measured against LOS D standard, all of the study Caltrans intersections are projected to operate at unacceptable levels of service during at least one of the peak hours under cumulative conditions.

The proposed 400-student school scenario would have a negative impact, based on Caltrans impact criteria, on all five study Caltrans intersections:

1. Bayfront Expressway and Marsh Road - (Impact - AM & PM peak hours)
3. US 101 Northbound Ramps and Marsh Road - (Impact - AM & PM peak hours)
4. US 101 Southbound Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - AM peak hour)

The intersection level of service calculation sheets are included in Appendix B.

Intersection Mitigation Measures under Cumulative Conditions

It was projected that ten out of the eleven study intersections would be impacted by the proposed project under cumulative conditions, based on City of Menlo Park impact criteria. In addition, all five of the study Caltrans intersection also are projected to be impacted by the proposed school project, based on Caltrans impact criteria.

Described below are the intersection impacts and possible mitigation measures under cumulative conditions. However, their feasibility has yet to be determined by the lead agency. Locations where full intersection improvements are not implemented or where there are no feasible improvements, the intersection would continue to operate at substandard levels and it would be considered a ***significant and unavoidable*** level of service impact.

At locations where implementation of the proposed improvements is not feasible, the proposed project could be required to contribute to the implemention of alternative transportation system improvements that are focused on making the transportation system more efficient and improving the City's overall multimodal transportation system. Multimodal transporation system improvements could be required in lieu of intersection improvements to offset a project impact, improving the transporation system for all users. Examples of such improvements could include signal timing changes, signal synchronization, adaptive traffic signal systems, bicycle, pedestrian and transit infrastructure improvements, and streetscape projects to enhance the pedestrian environment. However, such improvements may not completely offset the intersection impact. As such, the impact would still be considered significant and unavoidable. Therefore, it is recommended that the SUHSD work with the lead agency to determine the feasibility of each of the proposed mitigations and their implementation, or determine the implementation of alternative transportation system improvements as possible mitigation measures, as well as determine the project's fair share contribution towards the intersection improvements.

It should be noted that some of the improvements listed below have already been identified as mitigation measures for approved projects in the project area. However, as mentioned previously, proposed mitigation measures by others were not assumed in place under cumulative conditions since it is unknown when or if the improvements would be implemented, in particular the proposed mitigations at Caltrans intersection, where the City has no authority over the intersection improvements.

The resulting level of service conditions with the proposed intersection improvements under cumulative plus project conditions are summarized in Table 31. The proposed improvements are shown graphically on Figure 16, in the previous chapter.

1. Bayfront Expressway and Marsh Road

Impact: This State-controlled signalized intersection is projected to operate at unacceptable LOS F during both the AM and PM peak hours under cumulative conditions. However, the project is not projected to increase the most critical delay on the local approaches of the intersection. Therefore, based on City of Menlo Park intersection level of service impact criteria, the proposed project would not have a significant impact at this intersection (***less than significant impact***).

Based on Caltrans intersection impact criteria, the proposed project is projected to result in an impact at this intersection during both the AM and PM peak hours under cumulative conditions (project would increase intersection delay by 4 seconds or more).

Mitigation: A potential mitigation measure at this intersection includes the addition of a third eastbound right-turn lane on Marsh Road and restriping the southbound through lane as a shared right-and-through lane. Intersection operations would improve with implementation of the above improvements. However, the intersection would continue to operate at unacceptable levels of service during the peak hours under cumulative plus project conditions. Additionally, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

The restriping of the southbound approach of this intersection has been identified as an improvement for the St. Anton (Haven Avenue Residential) development and it is currently in the design phase. The addition of a third eastbound right-turn lane on Marsh Road was identified as a potential mitigation measure for the approved Commonwealth Corporate Center project. However, the impact was determined significant and unavoidable because the intersection is under the jurisdiction of Caltrans and the City cannot guarantee that the mitigation measure would be implemented.

2. Constitution Drive and Independence Drive

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS F during the AM peak hour under cumulative conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the AM peak hour under cumulative plus project conditions. This constitutes a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Mitigation: A potential mitigation measure at this intersection consists of prohibiting the northbound left-turn movement from Constitution Drive to westbound Independence Drive. The traffic volumes projected to make this movement under cumulative plus project conditions are less than 10 vehicles during the peak hours, which would be rerouted to the intersection of Chrysler Drive and Constitution Drive. With the elimination of the northbound left-turn movement at this intersection, the intersection is projected to operate at acceptable LOS A during both peak hours under cumulative plus project conditions.

Table 31
Cumulative Conditions Intersection Levels of Service – With Mitigations

Study Number	Intersection	Existing Intersection Control	Jurisdiction	LOS Standard	Peak Hour	Cumulative (No Project) Delay [1]	Cumulative (No Project) LOS [2]	Cumulative with Project (400 students) Delay [1]	Cumulative with Project (400 students) LOS [2]	Cumulative with Project (400 students) Change in Delay [3]	Cumulative With Project With Mitigations Delay [1]	Cumulative With Project With Mitigations LOS [2]	Cumulative With Project With Mitigations Change in Delay [3]
1	Bayfront Expressway and Marsh Road	Signal	State (with local approaches)/ CMP	D	AM	1009.1 [4]	F	1083.2 [4]	F	74.1	744.3 [4]	F	54.1
	SB Critical Delay					*282.8* [4]	*F*	*282.8* [4]	*F*	*0.0*	*75.2*	*E*	*0.0*
	WB Critical Delay					*54.0*	*D*	*54.0*	*D*	*0.0*	*54.0*	*D*	*0.0*
					PM	797.6 [4]	F	819.8 [4]	F	22.2	548.3 [4]	F	18.3
	SB Critical Delay					*62.8*	*E*	*62.8*	*E*	*0.0*	*62.8*	*E*	*0.0*
	WB Critical Delay					*65.2*	*E*	*65.2*	*E*	*0.0*	*65.2*	*E*	*0.0*
2	Constitution Drive and Independence Drive	2-Way Stop	Menlo Park	C	AM	4266.2 [4]	F	10000.0 [4]	F	5733.8	6.1	A	0.1
					PM	15.6	C	16.4	C	0.8	4.0	A	0.0
3	US-101 NB Ramps and Marsh Road	Signal	State	D	AM	167.1 [4]	F	187.8 [4]	F	20.7	126.8 [4]	F	18.1
					PM	115.2 [4]	F	122.5 [4]	F	7.3	105.8 [4]	F	5.5
4	US-101 SB Ramps and Marsh Road	Signal	State	D	AM	108.4 [4]	F	118.4 [4]	F	10.0	No Feasible Mitigation		
					PM	163.2 [4]	F	169.8 [4]	F	6.6			
5	Bayfront Expressway and Chrysler Drive	Signal	State (with local approaches)	D	AM	30.3	C	38.2	D	7.9	30.0	C	1.2
					PM	95.2	F	107.6 [4]	F	12.4	45.6	D	2.3
	EB Critical Delay					*322.1* [4]	*F*	*361.9* [4]	*F*	*39.7*	*63.1*	*E*	*9.3*
6	Constitution Drive and Chrysler Drive	4-Way Stop	Menlo Park	C	AM	44.9	E	125.8	F	80.9	27.2	C	1.7
					PM	492.1 [4]	F	554.6 [4]	F	62.5	122.0 [4]	F	4.5
7	Jefferson Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	12.4	B	14.1	B	1.7	28.2	C	20.7
					PM	34.2	D	69.5	F	35.4	24.8	C	5.5
8	Independence Drive and Chrysler Drive	1-Way Stop	Menlo Park	C	AM	14.7	B	16.3	C	1.6	11.6	B	0.5
					PM	30.8	D	33.6	D	2.8	22.6	C	1.3
9	Constitution Drive and Jefferson Drive	1-Way Stop	Menlo Park	C	AM	20.2	C	23.0	C	2.9	22.5	C	2.7
					PM	58.0	F	69.8	F	11.8	69.5	F	11.7
10	Bayfront Expressway and Chilco Street	Signal	State (with local approaches)	D	AM	182.6 [4]	F	186.9 [4]	F	4.3	54.8	D	4.4
	EB Critical Delay					*106.0* [4]	*F*	*106.0* [4]	*F*	*0.0*	*150.4* [4]	*F*	*1.0*
					PM	276.1 [4]	F	278.5 [4]	F	2.4	105.7 [4]	F	1.8
	EB Critical Delay					*1234.5* [4]	*F*	*1244.6* [4]	*F*	*10.2*	*301.9* [4]	*F*	*2.8*
11	Constitution Drive and Chilco Street	4-Way Stop	Menlo Park	C	AM	514.8 [4]	F	537.5 [4]	F	22.7	226.2 [4]	F	46.7
					PM	785.4 [4]	F	789.6 [4]	F	4.2	149.8 [4]	F	9.7

Notes:

[1] Delay = average seconds of delay per vehicle for all vehicles at signalized and 4-way stop-controlled intersections, and average worst approach delay for vehicles at 2-way/1-way stop-controlled intersections.

[2] LOS = level of service for the entire intersection at signalized and 4-way stop-controlled intersections, and for the worst approach at 2-way/1-way stop-controlled intersections.

[3] Level of service impact thresholds include a change in the average intersection delay of 23 seconds or more at intersections operating at acceptable levels and a change in all critical movements of more 0.8 seconds or at City of Menlo Park intersections or a change of 0.8 seconds or more on the local approaches' most critical movement at State-controlled intersections operating at substandard levels. Level of service impact threshold for State intersections operating at unacceptable levels of service (LOS E or F) is the increase of 4 or more seconds to the average intersection delay.

[4] The HCM methodology for intersection analysis does not accurately calculate actual intersection operating conditions once the calculated intersection delay exceeds 100+ seconds. Once an intersection is calculated to operate with delays exceeding 100 seconds, any additional traffic to the intersection will increase the intersection delay exponentially, resulting in unrealistic excessive delays that most likely would never be experienced at an actual intersection. However, for the purpose of quantifying the projected increase in delay due to the proposed project, all calculated delays are reported, including those exceeding 100 seconds.

Entries denoted in **bold** indicate conditions that exceed the City's (and/or Caltrans for the applicable intersections) current level of service standard.

- Denotes significant impact based on City of Menlo Park criteria.
- Denotes significant impact based on Caltrans criteria.

Although intersection operating conditions would improve with the above improvements, additional comprehensive analysis of this improvement is required in order to determine its feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvement. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable***.

The above improvement also was identified as a potential mitigation measure for the approved Commonwealth Corporate Center project but its feasibility was not determined (impact was determined significant and unavoidable).

3. US 101 Northbound Ramps and Marsh Road

Impact: This State signalized intersection is projected to operate at unacceptable LOS F during both peak hours under cumulative conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both the AM and PM peak hours under cumulative plus project conditions. This constitutes a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Additionally, based on Caltrans intersection impact criteria, the proposed project is projected to result in an impact at this intersection during both the AM and PM peak hours (project would increase intersection delay by 4 seconds or more).

Mitigation: A potential mitigation measure at this intersection includes the widening of the northbound off-ramp to include a second northbound right-turn lane. Intersection operations would improve with implementation of the second northbound right-turn lane. However, the intersection would continue to operate at unacceptable levels of service during the peak hours under cumulative plus project conditions. In order to improve the intersection's level of service to acceptable levels, Marsh Road, and the bridge structure over US 101, would have to be widened from four to six lanes. A project of such magnitude could not feasibly be implemented by a single development project. Additionally, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

The widening of the northbound off-ramp to include a second northbound right-turn lane was identified as a potential mitigation measure for the approved Facebook Campus project. However, the impact was determined significant and unavoidable because the intersection is under the jurisdiction of Caltrans and the City cannot guarantee that the mitigation measure would be implemented.

4. US 101 Southbound Ramps and Marsh Road

Impact: This State signalized intersection is projected to operate at unacceptable LOS F during both peak hours under cumulative conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both the AM and PM peak hours under cumulative plus project conditions. This constitutes a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Additionally, based on Caltrans intersection impact criteria, the proposed project is projected to result in an impact at this intersection during both the AM and PM peak hours (project would increase intersection delay by 4 seconds or more).

Mitigation: A potential mitigation measure at this intersection includes the widening of the southbound off-ramp to add a second southbound right-turn lane and converting the existing southbound right-turn lane into a shared left-and-right turn lane. In addition to widening the southbound off-ramp, this improvement would require the widening of

Marsh Road in the eastbound direction to provide a third receiving lane. With implementation of the above improvements, the intersection is projected to operate at acceptable levels of service under cumulative plus conditions. However, an improvement project of such magnitude could not feasibly be implemented by a single development project. Additionally, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

The widening of the southbound off-ramp to add a second southbound right-turn lane and converting the existing southbound right-turn lane into a shared left-and-right turn lane was identified as a potential mitigation measure for the approved Commonwealth Corporate Center project. However, the impact was determined significant and unavoidable due to right-of-way requirements that would be needed for the receiving lane on the Marsh Road bridge over US 101.

5. Bayfront Expressway and Chrysler Drive

Impact: This State-controlled signalized intersection is projected to operate at unacceptable LOS F during the PM peak-hour under cumulative conditions. The proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour under cumulative plus project conditions. This constitutes a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Additionally, based on Caltrans intersection impact criteria, the proposed project is projected to result in an impact at this intersection during the PM peak hour under cumulative conditions (project would increase intersection delay by 4 seconds or more).

Improvement: The proposed mitigation measure at this intersection consists of the addition of a third eastbound left-turn lane on Chrysler Drive onto northbound Bayfront Expressway. Implementation of the proposed mitigation would improve intersection operations to acceptable levels during both peak hours under cumulative plus project conditions. However, since this intersection is under the jurisdiction of Caltrans, the City has not control over what improvements are implemented. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

The above proposed mitigation measure is included in the City's Traffic Impact Fee (TIF) program recommended intersections improvements. Therefore, payment of the TIF by the project, as stipulated in the TIF ordinance, will be considered mitigation for the project impact at this intersection. Transportation impact fees must be paid in full to the City of Menlo Park before a building permit is issued.

6. Constitution Drive and Chrysler Drive

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS E and F during the AM and PM peak hours, respectively, under cumulative conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both peak hours under cumulative plus project conditions. This constitutes a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Mitigation: A potential mitigation measure at this intersection consists of the installation of a traffic signal, the addition of a separate left-turn lane on both approaches of Constitution Drive and the westbound approach on Chrysler Drive, and restriping the eastbound approach to include a share left-and-through and a share right-and-through lane. The traffic signal warrant check showed that this intersection is projected to have traffic volumes that satisfy the CA MUTCD peak-hour warrant (Warrant #3) during both peak hours under cumulative plus project conditions (this is discussed in the following chapter). Implementation of the above improvements would improve the intersection operating conditions to better than no project conditions.

Although intersection operating conditions would improve with the above improvements, the intersection would continue to operate at an unacceptable level of service during the PM peak hour under cumulative plus project conditions. Additionally, the decision to install a traffic signal should not be based purely on the signal warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Engineering judgment should be exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak hour warrant, therefore, are subject to further analysis before determining that a traffic signal is necessary. Thus, comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvements. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*****.**

The signalization of the intersection, addition of a separate southbound left-turn lane, and the restriping of the shared lanes on the eastbound approach were also identified as mitigation measures for the approved Menlo Gateway project.

7. Jefferson Drive and Chrysler Drive

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS D during the PM peak hour under cumulative conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under cumulative plus project conditions. This constitute a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Mitigation: A potential mitigation measure at this intersection consists of the installation of a traffic signal. The traffic signal warrant check showed that this intersection is projected to have traffic volumes that satisfy the CA MUTCD peak-hour warrant (Warrant #3) during the PM peak hour under cumulative plus project conditions (this is discussed in the following chapter). Signalizing the intersection would improve the intersection operating conditions to acceptable levels during both peak hours under cumulative plus project conditions.

Although the above improvements would reduce to project impact to less than significant, the decision to install a traffic signal should not be based purely on the signal warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Engineering judgment should be exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak hour warrant, therefore, are subject to further analysis before determining that a traffic signal is necessary. Thus, comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvements. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*****.**

Installation of a traffic signal at this intersection was identified as a potential mitigation measure for the approved Commonwealth Corporate Center project but its feasibility was not determined (impact was determined significant and unavoidable).

8. Independence Drive and Chrysler Drive

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS D during the PM peak hour under cumulative conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under cumulative plus project conditions. This constitute a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Mitigation: A potential mitigation measure at this intersection consists of the addition of a separate left-turn lane on the southbound direction on Independence Drive and a separate right-turn lane on the westbound direction on Chrysler Drive. Implementation of the above improvements would improve the intersection operating conditions to acceptable levels during both peak hours under cumulative plus project conditions.

Although the above improvements would reduce to project impact to less than significant, additional comprehensive analysis of this improvement is required in order to determine its feasibility. If determined feasible, it will be the City's discretion whether or not to implement the improvement. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*.**

The above improvement, in addition to installation of a traffic signal, were identified as a potential mitigation measure for the approved Commonwealth Corporate Center project but its feasibility was not determined (impact was determined significant and unavoidable).

9. Constitution Drive and Jefferson Drive

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS F during the PM peak hour under cumulative conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under cumulative plus project conditions. This constitute a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Improvement: A potential mitigation measure at this intersection consists of the addition of a separate left-turn lane on the northbound approach on Constitution Drive. Implementation of the above improvements would improve the intersection operating conditions; however, the intersection would continue to operate at unacceptable level of service during the PM peak hour. There are no further feasible improvements available at this intersection. Therefore, the project impact at this intersection is deemed ***significant and unavoidable*.**

10. Bayfront Expressway and Chilco Street

Impact: This State-controlled signalized intersection is projected to operate at unacceptable LOS F during both peak hours under cumulative conditions. The proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour under cumulative plus project conditions. This constitute a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Additionally, based on Caltrans intersection impact criteria, the proposed project is projected to result in an impact at this intersection during the AM peak hour cumulative conditions (project would increase intersection delay by 4 seconds or more).

Improvement: A potential mitigation measure at this intersection includes the addition of a second eastbound left-turn lane on Chilco Drive and converting the existing eastbound left-turn lane into a shared left-and-right turn lane. Implementation of the above improvements would improve the intersection operating conditions; however, the intersection would continue to operate at unacceptable level of service during the PM peak hour under cumulative plus project conditions.

Although intersection operating conditions would improve with the above improvements, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

The addition of a second eastbound left-turn lane on Chilco Drive was identified as a project impact potential mitigation measure for the approved Menlo Gateway project.

11. Constitution Drive and Chilco Street

Impact: This City of Menlo Park unsignalized intersection is projected to operate at unacceptable LOS F during both peak hours under cumulative conditions. The proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both peak hours under cumulative plus project conditions. This constitute a ***significant project impact***, based on City of Menlo Park intersection impact criteria.

Improvement: A potential mitigation measure at this intersection consists of the installation of a traffic signal and the addition of a separate left-turn lane on the southbound, eastbound, and westbound approaches and a separate right-turn lane on the northbound approach on Constitution Drive. The traffic signal warrant check showed that this intersection is projected to have traffic volumes that satisfy the CA MUTCD peak-hour warrant (Warrant #3) during both peak hours under cumulative plus project conditions (this is discussed in the following chapter). Implementation of the above intersection would improve the intersection operating conditions to better than cumulative no project conditions; However, the intersection would continue to operate at an unacceptable level of service during both peak hours.

Although intersection operating conditions would improve with the above improvements, the decision to install a traffic signal should not be based purely on the signal warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Engineering judgment should be exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak hour warrant, therefore, are subject to further analysis before determining that a traffic signal is necessary. Thus, comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. If determined feasible, it will be the City’s discretion whether or not to implement the improvements. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*****.**

The addition of a separate southbound left-turn lane at this intersection was identified as a potential mitigation measure for the approved Commonwealth Corporate Center project.

Cumulative Conditions Roadway Segment Analysis

The results of the roadway segment analysis under cumulative conditions are summarized in Table 32. The results of the analysis show that five study roadway segments are projected to have traffic volumes that exceed their acceptable capacities under cumulative plus project conditions. In addition, increases in daily traffic volumes associated with the proposed school project are projected to meet the potential

Table 32
Cumulative Conditions Roadway Segment Analysis Results

	Roadway Segment	Classification	Capacity	Cumulative ADT	ADT Project Trips	ADT Cumulative Plus Project	ADT % Change from Cumulative	Potentially Significant Impact[1]
1	Jefferson Drive, south of Chrysler Drive	Local	1,500	**2,540**	**388**	**2,928**	**15.3%**	**Yes**
2	Chrysler Drive, between Jefferson Drive and Constitution Drive	Local	1,500	**8,800**	**350**	**9,150**	**4.0%**	**Yes**
3	Chrysler Drive, between Constitution Drive and Bayfront Expressway	Collector	10,000	**14,840**	**311**	**15,151**	**2.1%**	**Yes**
4	Independence Drive, north of Chrysler Drive	Local	1,500	**5,900**	**39**	**5,939**	**0.7%**	**Yes**
5	Constitution Drive, between Jefferson Drive and Chilco Street	Collector	10,000	5,750	60	5,810	1.0%	No
6	Chilco Street, between Constitution Drive and Bayfront Expressway	Collector	10,000	**10,140**	28	**10,168**	0.3%	No

Notes:
ADT = Average Daily Traffic
Roadway segment classification, capacity, and existing ADT information obtained from the *Circulation Existing Conditions* Report (City of Menlo Park General Plan), January 2015, with the exception of segments #1 and #4.
[1] The City of Menlo Park identifies the following roadway segment capacity thresholds as potential impact criteria:
Local Street - Potential impact if ADT is >1,350 vehicles and project adds >25 trips, or ADT is >750 and project increases ADT by 12.5%, or ADT is <750 and project increases ADT by 25%.
Collector Street - Potential impact if ADT is >9,000 vehicles and project adds >50 trips, or ADT is >5,000 and project increases ADT by 12.5%, or ADT is <5,000 and project increases ADT by 25%.
Bold indicates ADT values that exceed the acceptable capacity.

impact criteria for four of the study roadway segments. Therefore, based on City of Menlo Park potential impact criteria for roadway segments, the proposed project would result in a potentially significant impact at the following roadway segments under cumulative conditions:

1. Jefferson Drive, south of Chrysler Drive
2. Chrysler Drive, between Jefferson Drive and Constitution Drive
3. Chrysler Drive, between Constitution Drive and Bayfront Expressway
4. Independence Drive, north of Chrysler Drive

The study roadway segments of Jefferson Drive, Chrysler Drive (between Jefferson Drive and Constitution Drive), and Independence Drive are classified as local streets (which tend to have lower traffic thresholds that are more typical of residential areas) although they are located in an industrial area. If these three roadway segments would be classified as collector roadways, they would have traffic volumes within their designated capacities and they would not be impacted by the project. The evaluation of these three segments, therefore, represents a conservative analysis.

The roadway segment of Chrysler Drive, between Constitution Drive and Bayfront Expressway, is projected to carry the most traffic out of all the study roadway segments under cumulative conditions.

Possible Roadway Improvements

Typical roadway network improvements focus in adding capacity to the facility in order to serve the projected increased in traffic volumes. However, the potential impacts to the above roadway segment are based on a designated daily traffic volume limit for the facility, which would not change with the addition of capacity to the roadway. In addition, increasing the capacity of the above roadways would require right-of-way acquisition, which would affect adjacent property owners and is considered unfeasible. Widening of roadways also could lead to other negative effects, such as induced travel demand (more people would be willing to drive rather than taking alternative transportation modes as a result of the increase roadway capacity), reduction in the use of alternative transportation modes, air quality degradation, increase in noise, and reduced safety for pedestrians and bicyclists (due to wider roadways and increased traffic volumes). Therefore, potential impacts on the above roadways are deemed ***significant and unavoidable***.

Although there are no feasible improvements to mitigate the potential roadway segment impacts, other possible improvements and efforts could be implemented to reduce the amount of project traffic added to the roadway segments. The improvements include the following:

- The project could contribute to the completion of planned bicycle facilities in the project area in an effort to encourage more students to bike to school. The City of Menlo Park *Comprehensive Bicycle Development Plan* identifies Class III bike routes along Constitution Drive. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.
- The project could contribute to the completion of planned sidewalk projects in the area that would close existing gaps in the sidewalk network and provide a continuous network connecting the project site to the adjacent neighborhoods. The City of Menlo Park *Sidewalk Master Plan* has identified the entire length of Jefferson Drive, as well as segments of Chrysler Drive, Constitution Drive, and Chilco Street, as priority (high ranking) streets for the installation of missing sidewalks. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.
- The City of Menlo Park, in conjunction with SamTrans, should consider adding bus services to directly serve the project area.
- The project should encourage students to walk, ride their bike, or take public transportation to school in an effort to reduce the amount of traffic generated by the proposed project.

Cumulative Conditions Routes of Regional Significance Analysis

The results of the routes of regional significance analysis under cumulative conditions are summarized in Table 33. The results of the analysis shows that all directional roadway segments analyzed, with the exception of the northbound direction of the segment of Bayfront Expressway, from Willow Road to US 101, are projected to continue to operate within the segments' level of service standard.

The segment of Bayfront Expressway, northbound direction from Willow Road to US 101, is projected to operate at unacceptable LOS E during the AM peak hour under cumulative conditions. The proposed project is projected to add traffic to this segment representing less than four percent (4%) of the segment's capacity. Therefore, based on CMP impact criteria, the proposed project would have an impact at this study route of regional significance.

Possible Route of Regional Significance Improvements

Typical roadway improvements consist in the widening of the roadway to add travel lanes and capacity to serve the projected increased in traffic volumes. However, the study Routes of Regional Significance are under the jurisdiction of Caltrans and the City has no authority over the implementation of improvements. Additionally, an improvement project of such magnitude could not feasibly be implemented by a single development project. Freeway and other state roadway projects are planned and funded on a regional scale. Therefore, potential impacts on the above Route of Regional Significance are deemed ***significant and unavoidable***.

Although there are no feasible improvements to mitigate the potential Routes of Regional Significance impacts, other possible improvements and efforts could be implemented to reduce the amount of project traffic added to these roadway segments. The improvements include the following:

- The project could contribute to the completion of planned bicycle facilities in the project area in an effort to encourage more students to bike to school. The City of Menlo Park *Comprehensive Bicycle Development Plan* identifies Class III bike routes along Constitution Drive. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.

Table 33
Cumulative Conditions Routes of Regional Significance Analysis Results

						Cumulative		Cumulative Plus Project				
Route	Segment	Direction	LOS Standard[1]	Capacity[2]	Peak Hour	Total Volume	V/C	Net Project Trips	Total Volume	V/C	LOS	Project % of Capacity
US 101	North of Marsh Road	NB	F	9,200	AM	7,067	0.768	44	7,111	0.773	D	0.5%
				9,200	PM	7,107	0.773	29	7,136	0.776	D	0.3%
	North of Marsh Road	SB	F	9,200	AM	8,883	0.966	53	8,936	0.971	E	0.6%
				9,200	PM	8,090	0.879	24	8,114	0.882	E	0.3%
US 101	South of Marsh Road	NB	F	9,200	AM	6,999	0.761	35	7,034	0.765	D	0.4%
				9,200	PM	6,350	0.690	16	6,366	0.692	D	0.2%
	South of Marsh Road	SB	F	9,200	AM	7,884	0.857	29	7,913	0.860	E	0.3%
				9,200	PM	7,853	0.854	19	7,872	0.856	E	0.2%
Bayfront Expressway (SR 84)	from Willow Road (SR 114) to US 101	NB	D	3,300	AM	**3,037**	**0.920**	**125**	**3,162**	**0.958**	**E**	**3.8%**
				3,300	PM	2,876	0.872	82	2,958	0.896	D	2.5%
	from US 101 to Willow Road (SR 114)	SB	D	3,300	AM	2,358	0.715	91	2,449	0.742	C	2.8%
				3,300	PM	2,667	0.808	41	2,708	0.821	D	1.2%

Notes:
V/C = Volume to Capacity Ratio; LOS = Level of Service.
[1] Level of service standards as defined in the C/CAG *LOS and Performance Measure Monitoring Report* , 2015.
[2] The *Highway Capacity Manual* identifies capacity values for freeway segments with six or more lanes as 2,300 vehicles per hour per lane (vphpl); the capacity for four-lane freeway segments is identified as 2,200 vphpl.
Arterial capacity is estimated to be 1,100 vphpl, based on a saturation flow rate of 1,900 vphpl and assuming the arterial facility receives 60 percent of the green time.
Bold indicates segment operating at substandard levels of service.
- Denotes potential significant project impact.

- The project could contribute to the completion of planned sidewalk projects in the area that would close existing gaps in the sidewalk network and provide a continuous network connecting the project site to the adjacent neighborhoods. The City of Menlo Park *Sidewalk Master Plan* has identified the entire length of Jefferson Drive, as well as segments of Chrysler Drive, Constitution Drive, and Chilco Street, as priority (high ranking) streets for the installation of missing sidewalks. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.
- The City of Menlo Park, in conjunction with SamTrans, should consider adding bus services to directly serve the project area.
- The project should encourage students to walk, ride their bike, or take public transportation to school in an effort to reduce the amount of traffic generated by the proposed project.

Cumulative Conditions Freeway Ramp Analysis

Table 34 shows the projected cumulative conditions ramp volumes and levels of service during the peak hours.

Based on the calculated V/C ratios, the following freeway ramps are projected to operate at substandard levels under cumulative conditions, based on Caltrans standards:

Northbound on-ramp from westbound Marsh Road (LOS F – AM & PM peak hours)
Southbound on-ramp from westbound Marsh Road (LOS E - PM peak hour)

Based on Caltrans impact criteria, the proposed project would have a cumulative impact at the above freeway ramps since it would add traffic to a facility operating at substandard levels. The proposed project would add traffic to the above ramps representing no more than 5% of the ramps' capacity.

The remainder of the study interchange ramps are projected to operate at acceptable levels.

Possible Freeway Ramp Improvements

In order to improve the level of service conditions to acceptable levels at the study freeway ramps that are projected to be deficient under cumulative conditions, the following measures can be implemented:

- Increase capacity on the deficient freeway ramps – This can be accomplished by providing a higher service rate (increase meter rate) at the metered on-ramps. However, this is a State facility and the City has no authority over its operations or improvements.
- Reduce project traffic on the deficient freeway ramps – Project traffic using the impacted freeway on-ramps could use alternative routes. However, it is possible that the displaced project traffic could have a negative impact at other facilities.

Table 34
Cumulative Conditions Freeway Ramp Analysis Results

Interchange/Ramp	Ramp Type	Existing Control Type	Peak Hour	Ramp Capacity (vph)[1]	Cumulative Plus Project Conditions: Total Volume	Project Trips	Mixed-flow Volume (vph)[2]	HOV Volume (vph)[3]	V/C [4]	LOS [4]	Project's % of Capacity
US 101 at Marsh Road											
NB off-ramp to Marsh Rd	Diagonal	Signal	AM	2,000	1,588	35	1,588	N/A	0.794	C	1.8%
		Signal	PM	2,000	1,120	14	1,120	N/A	0.560	A	0.7%
NB on-ramp from WB Marsh Rd	Diagonal	Meter	AM	900	**2,293**	**44**	**1,720**	**573**	**1.911**	**F**	4.9%
		Meter	PM	900	**1,396**	**29**	**977**	**419**	**1.086**	**F**	3.2%
SB off-ramp to Marsh Rd	Diagonal	Signal	AM	4,000	2,448	53	2,448	N/A	0.612	B	1.3%
		Signal	PM	4,000	2,154	24	2,154	N/A	0.539	A	0.6%
SB on-ramp from WB Marsh Rd	Loop	Meter	AM	900	334	29	334	N/A	0.371	A	3.2%
		Meter	PM	900	**871**	**19**	**871**	**N/A**	**0.968**	**E**	2.1%

Notes:

[1] Typical capacity for diagonal ramps is 2,000 vehicles per hour per lane (vphpl).
The capacity for non-metered ramps is determined based on the number of lanes at the ramp's constraint point.
The capacity for metered on-ramps was assumed to be 900 vphpl for mixed-flow lane ramps, regardless of the number of lanes. At ramps that include HOV lanes, the analysis is based on the mixed-flow lane(s) ONLY.

[2] Existing ramp count data provided by Caltrans and consists of 2015 counts.

[3] HOV traffic volumes at the northbound on-ramp from westbound Marsh Road was assumed to be 25% and 30% of total traffic volume during the AM and PM peak hour, respectively, based on the percentage of HOV traffic on the freeway mainline.

[4] The calculated volume-to-capacity (V/C) ratio at the northbound on-ramp from westbound Marsh Road corresponds to the mixed-flow traffic volumes and capacity ONLY (the HOV lane is projected to operate adequately).
The ramp level of service corresponds to the calculated ramp V/C ratios.

Bold indicates substandard level of service conditions, based on Caltrans level of service standard of LOS C or better.

▭ - Denotes potential project impact.

7.
Other Transportation Issues

This chapter presents an analysis of other transportation issues associated with the project site, including:

- Signal warrant analysis
- Site access analysis
- On-site circulation
- Pedestrian Circulation
- Parking
- Drop-off and pick-up activities
- Potential impacts to bike, pedestrian and transit facilities

Unlike the level of service impact methodology, which is adopted by the City Council, the analyses in this chapter are based on professional judgment in accordance with the standards and methods employed by the traffic engineering community.

Signal Warrant Analysis

The need for signalization of unsignalized intersections is assessed based on the Peak Hour Volume Warrant (Warrant 3) described in the *California Manual on Uniform Traffic Control Devices for Streets and Highways (CA MUTCD)*, Part 4, Highway Traffic Signals, 2015. This method makes no evaluation of intersection level of service, but simply provides an indication whether vehicular peak hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. Other traffic signal warrants are available, however, they cannot be checked under future conditions (near term and cumulative conditions) because they rely on data for which forecasts are not available (such as accidents, pedestrian volume, and four- or eight-hour vehicle volumes).The decision to install a traffic signal should not be based purely on the warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Additionally, engineering judgment is exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak hour warrant are subject to further analysis before determining that a traffic signal is necessary. Other options such as traffic control devices, signage, or geometric changes may be preferable based on existing field conditions.

Signal Warrant Analysis Results

The results of the signal warrant analysis are summarized in Table 35. The results show that traffic signals would be warranted at the following intersections under the noted scenarios:

Table 35
Peak-Hour Traffic Signal Warrant Analysis Results

		Warrant Met?															
		Existing		Existing Plus Project		Near-Term 2018		Near-Term 2018 Plus Project		Near-Term 2021		Near-Term 2021 Plus Project		Cumulative		Cumulative Plus Project	
Study Number	Intersection Name	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
2	Constitution Drive and Independence Drive	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
6	Constitution Drive and Chrysler Drive	No	No	No	No	No	**Yes**	No	**Yes**	No	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**
7	Jefferson Drive and Chrysler Drive	No	No	No	No	No	No	No	No	No	No	No	**Yes**	No	No	No	**Yes**
8	Independence Drive and Chrysler Drive	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
9	Constitution Drive and Jefferson Drive	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
11	Constitution Drive and Chilco Street	No	No	No	No	No	**Yes**	No	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Signal warrant analysis based on the Peak Hour Signal Warrant #3, Figure 4C Caltrans MUTCD 2015 Edition.

6. Constitution Drive and Chrysler Drive - Near term (2018 and 2021), near term plus project, cumulative, cumulative plus project
7. Jefferson Drive and Chrysler Drive - near term (2021) plus project and cumulative plus project
11. Constitution Drive and Chilco Street - Near term (2018 and 2021), near term plus project, cumulative, cumulative plus project

It should be noted that the need for a traffic signal at the intersection of Constitution Drive and Chrysler Drive (intersection #6) has already been identified as the mitigation measure for the approved Menlo Gateway project.

Additionally, the EIR for the Common Wealth Corporate Center project also identified the need for signalization of the Jefferson Drive and Chrysler Drive (intersection #7) intersection; however, it is the City's discretion whether or not the traffic signal at this location will be installed after additional traffic analysis is complete.

The peak-hour signal warrant sheets are included in Appendix C.

Site Access and On-Site Circulation

A review of the project site plans was performed to determine if adequate site access and on-site circulation is provided and to identify any access issues that should be improved. This review is based on the site plan dated March 21, 2016, by LPA, and in accordance with generally accepted traffic engineering standards.

Site Access

The project site is proposed to be served by two driveways, both of them along Jefferson Drive (see Figure 2). Both driveways would connect to an internal access roadway/drive aisle that would run along the perimeter of the project site, around the proposed school campus.

Due to the location of the parking lot and student drop-off area (discussed in more detailed in the following section), it is recommended that circulation within the site be designated as a one-way circulation (clockwise direction), resulting in inbound only access at the southern driveway and outbound only access at the northern driveway. The assignment of project traffic to the site for the site access analysis reflects this access pattern.

Both driveways are shown to be 24 feet wide, which is adequate width to provide two ingress/egress lanes.

Recommendation: It is recommended that circulation within the site be designated as a one-way circulation (clockwise direction).

On-Site Circulation

A single internal access roadway/drive aisle that would run along the site’s perimeter is being proposed. Along the northern and western project site boundaries, the drive aisle would be lined with 90-degree parking stalls on the side next to the site’s property line. No parking is proposed along the southern project site boundary. Additionally, along the western site boundary, adjacent to the school campus, a 10-foot wide, approximately 220 feet long designated student drop-off area is being proposed. The drive aisle is shown to be 24 feet wide along the northern and southern site boundaries, and 20 feet wide between the parking stalls and the drop-off area on the western site boundary. A 24-foot wide drive aisle can accommodate two lanes of travel.

The proposed layout of the access roadway/drive aisle, parking lot, and drop-off area provide for a convenient and effective vehicular on-site circulation. Some of the benefits of the proposed layout include:

- Two-lane access from the inbound (southern) driveway to the parking area. Providing two inbound lanes, the inner lane (lane next to the school campus) could serve as the drop-off lane, serving the drop-off area directly, while the second/outer lane would function as a bypass lane to serve all other non-drop-off traffic. Alternatively, both lanes could be utilized to serve the drop-off area and maximize the queue storage capacity within the site. This would provide twice the vehicle store capacity on-site to accommodate the expected drop-off queue, however, non-drop-off traffic would be forced to wait in the drop-off queue.
- Reduced conflict between vehicles parking and drop-off traffic by designating the inner inbound lane as the drop-off lane and the outer lane as the bypass lane. A bypass lane would allow vehicles wanting to park or exit the site to bypass the drop-off queue.
- Circulation within the site is simple and one-directional, with no dead ends or conflicting movements present.

Based on the proposed project site layout and aforementioned benefits, on-site circulation would be adequate.

Pedestrian Access and Circulation

Some of the students may walk or ride their bike to school. Pedestrian facilities in the project area consist primarily of sidewalks along the streets in the vicinity of the project site, marked crosswalks at intersections, and pedestrian push buttons and signal heads at signalized intersections.

However, partial sidewalks (either sidewalks are partially or complete missing along at least one side of the road) are found along Jefferson Drive, Independence Drive, Constitution Drive, Chrysler Drive, and Chilco Street. Sidewalks are found along most of the west side of Jefferson Drive, including along the project frontage, and only along a few segments on the east side of the street.

The missing sidewalks along streets in the immediate vicinity of the project site create a disconnection between the project site area and nearby neighborhoods. Additionally, no bicycle facilities are currently provided in the immediate vicinity of the project site, requiring bicyclist in the project area to share the roadway with vehicular traffic. The lack of continuous pedestrian and bicycle facilities connecting the project site to the adjacent neighborhoods potentially could discourage students from walking and/or riding their bike to school, or could force them to walk along property frontages without sidewalks, undeveloped roadway shoulders, and/or within the street.

Within the project site, the proposed drop-off area is located adjacent to the school campus, reducing the need for students to cross the drive aisle within the parking area.

Recommendation: It is recommended that the SUHSD works with the City of Menlo Park to develop a safe route to schools program that will define the safest routes for pedestrians between the adjacent residential areas and the project site.

Recommendation: The SUHSD could work with the City of Menlo Park to ensure pedestrian facilities in proximity to the project site are provided to the maximum extent possible. In particular, sidewalks along both sides of the entire extend of Jefferson Drive and along Chilco Street, which connects the project area with the Belle Haven neighborhood, are recommended.

Access Driveway Operations

Operations at the project driveways during drop-off times were evaluated. The operations analysis consist of a peak-hour traffic signal warrant check, level of service, and queue length evaluation at the project driveways. The estimated project trips at the driveways associated with a 400-student school are shown on Figure 18 below.

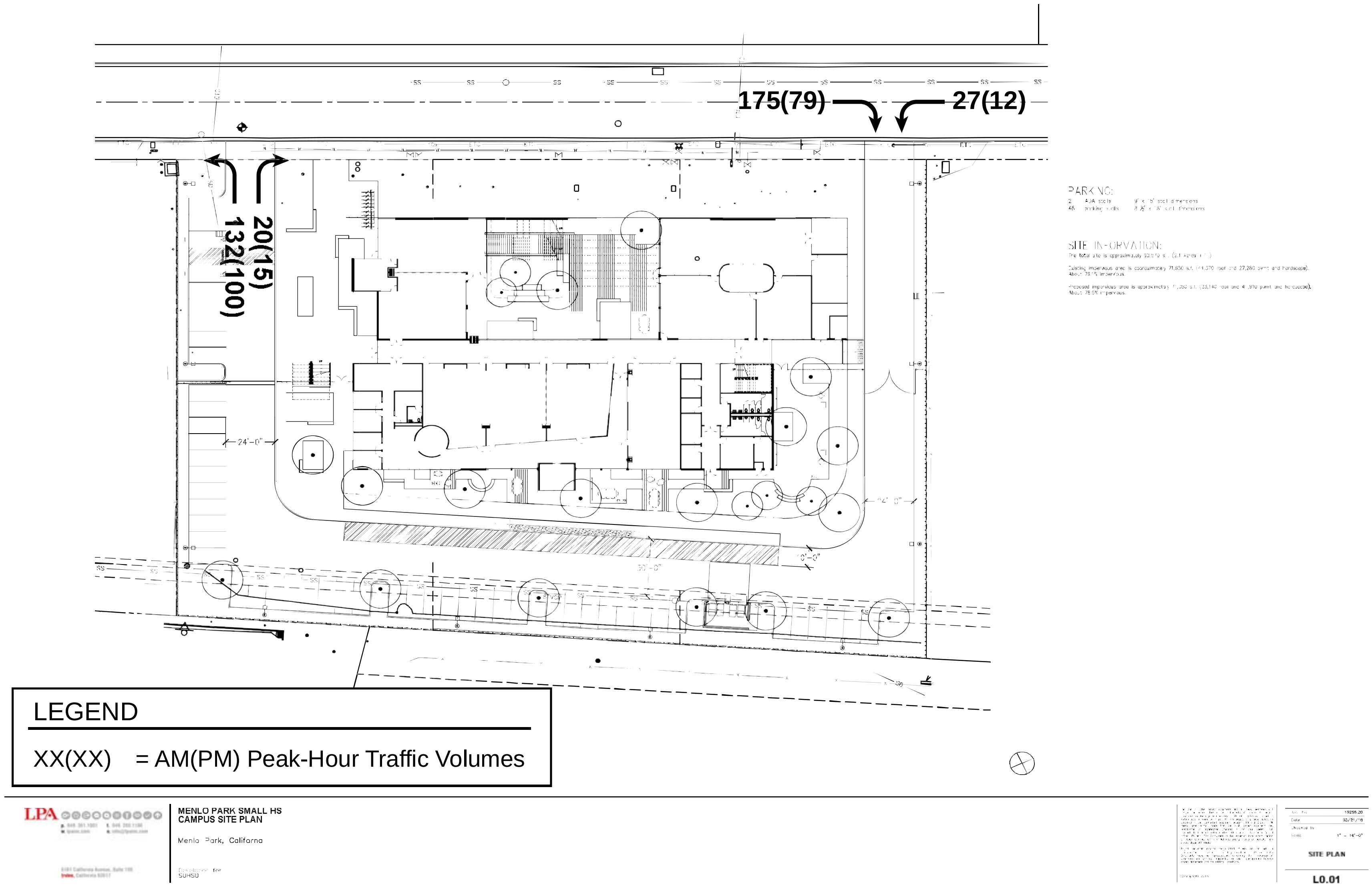

Figure 18
Proposed Project Trips at Project Site Driveways

Traffic volumes at the project driveways were checked to see if they would be sufficient to warrant the installation of a traffic signal. Based on the CA MUTCD peak-hour traffic signal warrant (warrant #3), the projected peak-hour traffic volumes at the project driveways would fall below the thresholds that warrant signalization.

Additionally, level of service calculations at the project driveways project both driveways to operate at LOS A during both the AM and PM peak hours. The maximum queue length at the outbound driveway is projected to be approximately 4 vehicles during the AM peak hour while the maximum queue at the inbound driveway is projected to be about 2 to 3 vehicles in the northbound direction on Jefferson Drive during the AM peak hour.

Based on the results of the analysis, operations at the project driveways are projected to be adequate.

Sight Distance

Adequate sight distance should be provided at the project outbound driveway. The outbound driveway is located along a straight roadway segment with minimal visual obstruction. The sight distance from this driveway to the north was measured to extend to Chrysler Drive (approximately 300 feet) while the sight distance to the south extends almost to the point where Jefferson Drive curves eastward (approximately 1,000 feet). By law, school zones have a 25 mile per hour (mph) speed limit. According to the Caltrans *Highway Design Manual*, the minimum required stopping sight distance for a roadway with a posted speed limit of 25 mph is 150 ft. Therefore, based on field observations and Caltrans requirements, the available sight distance at the outbound driveway on Jefferson Drive is adequate.

Recommendation: The design of the school campus should ensure design features, in particular the landscaping and signage along the school frontage, will not interfere with the sight distance at the proposed site driveways.

Emergency Vehicle and Truck Access

The 24-foot ingress and egress driveways should provide adequate access for emergency vehicles and trucks. The 20- to 24-foot drive aisle, along with adequate turn radii, would allow emergency vehicles to be able to circulate around the parking lot and have access to all parts of the school site.

The trash enclosure is shown on the site plan to be located at the southwest corner of the project site, making this location easily accessible by larger garbage trucks.

With the proposed parking lot layout, and adhering to City design standards and guidelines, emergency vehicle access and circulation within the project site should be adequate.

Parking

According to the project site plan, the project would provide a total of 50 parking spaces on site, two of which are labeled as accessible spaces. The proposed school would include 35 staff/faculty members and serve up to 400 students.

The project site is located within an area classified as M2 (General Industrial) District in the City of Menlo Park General Plan. Although the City has adopted off-street parking requirements for M2 Districts, it does not have parking requirements specific to schools. For this reason, estimated parking demand for the proposed school was estimated based on ITE parking generation rates and existing parking information at two other SUHSD high schools.

ITE Parking Generation Rates

The ITE parking generation rates for high school (described in the publication *Parking Generation*, 4th Edition) list an average peak period parking demand of 0.09 vehicles per student. Based on the ITE rate, the proposed project would need to provide approximately 71 parking spaces (36 for students and 35 for staff/faculty members) to serve the average peak period, assuming a total of 400 high school students and 35 staff/faculty members. Based on ITE parking generation rates, the school would not provide adequate on-site parking to meet its projected demand. However, it should be noted that the ITE parking generation rates are based on very limited data (based on only 3 studies) that may not be demographically equivalent to the proposed project.

Existing SUHSD High Schools Trip Generation Rates

Existing parking demand and supply information was obtained from two other SUHSD high schools with similar characteristics and settings as the proposed school project: Everest and East Palo Alto High Schools.

Everest High School has a current student enrollment of 381 students (with a maximum student capacity of 400 students), a total of 23 staff/faculty, and provides a total of 63 parking spaces on-site. Additionally, there are 9 on-street parking spaces adjacent to the school that, as school staff noted, are typically utilized by the school to serve overflow parking. According to Everest High School staff, the available parking spaces adequately serve the school's parking demand (an average parking rate of approximately 0.16 spaces per student).

East Palo Alto High School has a current student enrollment of 317 students (with a maximum student capacity of 400 students), a total of 30 staff/faculty, and provides a total of 50 parking spaces on-site. Additionally, East Palo Alto High School provides bus service to 50 of their students. According to East Palo Alto High School staff, the available parking spaces adequately serve the school's parking demand (an average parking rate of approximately 0.17 spaces per student).

Based on the existing schools information (assuming a parking generation rate of 0.17 spaces per student), it is estimated that at full capacity (400 students and 35 staff/faculty), the proposed school project would need to provide approximately 74 parking spaces to serve its projected demand. Based on this estimate, the proposed number of on-site parking spaces would not be sufficient to serve the estimated parking demand.

Americans with Disabilities Act Requirements

The Americans with Disabilities Act (ADA) requires developments to provide one accessible parking space for every 25 parking spaces provided, for parking lots with up to 100 spaces. Accessible parking spaces shall be at least 96 inches (8 feet) wide and shall be located on the shortest accessible route of travel from adjacent parking to an accessible entrance. In addition, one in every 8 accessible spaces, but no less than one, shall be served by an access aisle at least 96 inches wide and shall be designated as "van accessible". It should be noted that the accessible parking spaces are not additional parking spaces, but are part of the minimum parking spaces required. The project proposes to provide two accessible parking spaces, satisfying ADA requirements. The proposed accessible spaces are located across from a school entrance, along what seems to be the shortest accessible route.

Recommendation: It is recommended that the school work with the City and parents to develop parking alternatives and/or plans to reduce the number of students driving to the site. For example, the school could implement a permit parking program and limit the number of student parking permits issued, establish a carpool program, and/or provide incentive programs for students using alternative modes of transportation such as transit, biking, or walking to school.

Drop-Off and Pick-Up Activities

As proposed, the drop-off area is located adjacent to the school campus, a distance of approximately 260 feet from the inbound driveway. The drop-off area is shown on the site plan to be approximately 220 feet long.

Proposed Drop-off Circulation Analysis

With the proposed driveways and parking layout, vehicles would turn into the project site via the inbound driveway, travel westbound along the access roadway, and turn right towards the designated drop-off/pick-up area. Once the student is dropped-off, vehicles from the drop-off area would circulate around the parking lot towards the exit (outbound driveway).

As mentioned previously, two lanes with approximately 260 feet of queue storage capacity each would be provided from the inbound driveway to the drop-off area. Assuming one of the inbound lanes would be the designated drop-off lane, plus the drop-off area, a total of approximately 480 feet of queue storage capacity would be provided within the project site. Assuming an average of 25 feet of queue storage is needed per vehicle, the proposed queue storage space could accommodate up to 19 vehicles on site, 8-9 of which would be within the drop-off area.

The expected queue length within the drop-off lane was estimated using Poisson's probability distribution and based on the estimated inbound trip generation during the AM peak hour, which is the highest for the school. Estimating the queue length for the drop-off area based on the total number of vehicles entering the site in the morning is an extremely conservative analysis since some of those trips would be made by students/staff parking on site, and therefore, would not be included on the drop-off queue.

Based on the length of the drop-off area, 8 to 9 vehicles can be served at once. Assuming that dropping-off/picking-up a student and driving away would take up to one minute per vehicle and assuming eight vehicles are continuously served at once, this calculates to approximately 8 drop-offs/pick-ups per minute, or 240 drop-offs/pick-ups during half an hour. It is assumed that all students would arrive at the site within the half hour prior to the start of class. Using Poisson's probability and assuming a steady stream of inbound traffic, the average queue length for the 400-student school would be 202/240 (202 expected drop-offs in half an hour at the estimated service rate of 240 drop-offs in half an hour), or approximately 1 vehicle in the AM peak hour, given the above assumptions. Following the same method, it is estimated that a maximum of 2 vehicles would be queued up beyond the drop-off area at a given time during the AM peak hour (the maximum queue is approximately twice the average queue). However, it should be noted that these drop-off queue projections are estimates that assume a steady inbound traffic flow spread out over a 30-minute period. Assuming that the student drop-offs would occur within the 15 minutes prior to the beginning of the school day, the average queue length extending beyond the drop-off area would be approximately 2 vehicles and the maximum queue length would be approximately 4 vehicles. Therefore, the proposed vehicle queue storage capacity within the site is estimated to be adequate to serve the projected vehicular queue length.

Pedestrian and Bicycle Facilities

Potential project impacts on pedestrian and bicycle facilities are described below.

Pedestrian Facilities

Pedestrian facilities in the project area consist primarily of sidewalks along the streets as well as marked crosswalks at intersections and pedestrian push buttons and signal heads at signalized intersections. In the immediate vicinity of the project site, partial sidewalks are found along Jefferson Drive, Independence Drive, Constitution Drive, Chrysler Drive, and Chilco Street. Sidewalks are found along most of the west side of Jefferson Drive and only along a few segments on the east side of the street.

Based on student mode of access information provided by school staff, it was calculated that approximately 25% and 35% of the existing students at Everest and East Palo Alto High Schools, respectively, walk, ride their bike, or take public transportation to school. Both of these schools are located within residential neighborhoods that make it more accessible for students to use other modes of access besides the passenger vehicle. Since the proposed school site is located within an industrial area, the percentage of students walking/biking/taking transit may be lower.

As partial mitigation to their projected traffic impacts, the Commonwealth Corporate Center project plans to install sidewalks along the frontage at 138 and 160 Jefferson Drive and along both the Jefferson Drive and Chrysler Drive frontage at 1150 Chrysler Drive. Additionally, the Commonwealth project plans to install ADA-compliant pedestrian curb ramps across the Jefferson Drive leg of the Jefferson Drive/ Chrysler Drive intersection and across the east leg of Chrysler Drive at the Independence Drive/Chrysler Drive intersection.

The above planned improvements will help close gaps in the existing sidewalk network in the immediate vicinity of the project site.

City of Menlo Park General Plan

The City of Menlo Park *General Plan* identifies various policies to promote walking as an alternative mode of access for short trips. Some policies to achieve this goal include:

- The City shall require all new development to incorporate safe and attractive pedestrian facilities on-site.
- The City shall incorporate appropriate pedestrian facilities, traffic control, and street lighting within street improvement projects to maintain or improve pedestrian safety.
- The City shall prepare a safe school route program to enhance the safety of school children who walk to school.

City of Menlo Park Sidewalk Master Plan

The *2009 City of Menlo Park Sidewalk Master Plan* was developed to serve as a guideline for the allocation of capital, maintenance, administration, and matching funds for sidewalk facilities. The primary purpose of the plan is to prioritize sidewalk installation by providing an inventory of existing gaps in the City's sidewalk network. Priority streets are identified as those roadways that provide network connectivity and access to important pedestrian destinations, such as schools, parks ,and the downtown area. Roadway segments with missing sideways throughout the City were ranked into three categories: high, medium, and low ranking. The entire length of Jefferson Drive, as well as segments of Chrysler Drive, Constitution Drive, and Chilco Street have been identified in the Sidewalk Master Plan as high ranking segments.

City of Menlo Park Complete Streets Policy

The *2013 Complete Streets Policy* of the City of Menlo Park expresses the City's desire and commitment to create and maintain streets that provided safe, comfortable, and convenient travel for all users and abilities through a comprehensive, integrated transportation network. The policy calls for City agencies to work towards making Complete Streets practice a routine of everyday operations, project approach, and programs. Complete streets infrastructure should be considered in all planning, funding, design, approval, and implementation of any significant construction, reconstruction, or alteration of streets within the City. Possible improvements include sidewalks, bicycle facilities, paved shoulders, landscaping, accessible curb ramps, crosswalks, pedestrian signal heads, and public transit stops, among others.

Bicycle Facilities

No bicycle facilities are currently provided in the immediate vicinity of the project site. The closest bicycle facilities to the project site include Class II bikeways along Chilco Street, between Bayfront Expressway and just south of the railroad tracks (north of Hamilton Avenue), and the San Francisco Bay Trail along Bayfront Expressway.

Based on student mode of access information provided by school staff, it was calculated that approximately 5% and 3% of the existing students at Everest and East Palo Alto High Schools, respectively, ride their bike to school. Conservatively assuming that up to 5% of the proposed school students would ride their bike to school, this represents approximately 20 students riding their bike to the site. Since no bicycle facilities are currently provided in the immediate vicinity of the project site, the estimated 20 students riding their bike to school would share the roadway with vehicular traffic.

The City of Menlo Park General Plan identifies bicycle parking requirements for different land uses. However, no requirements are specified for schools. Nevertheless, and anticipating that some of the students would ride their bike to school, the school is proposing to provide bicycle racks on site. Based on the above estimate, the school should try to provide a minimum of 20 bicycle parking spaces on-site.

City of Menlo Park General Plan

The City of Menlo Park *General Plan* identifies various policies to promote the safe use of bicycle travel as a commute alternative and for recreation. Some policies to achieve this goal include:

- The City shall, within available funding, work to complete a system of bikeways within Menlo Park.
- The City shall encourage transit providers within San Mateo County to provide improved bicycle access to transit including secure storage at transit stations and on-board storage where feasible.

City of Menlo Park Comprehensive Bicycle Development Plan

The *2005 Menlo Park Comprehensive Bicycle Development Plan* provides a blueprint for a citywide system of bike lanes, bike routes, bike paths, bicycle parking, and other related facilities to allow for safe, efficient and convenient bicycle travel within the City. The purpose of the plan is to enhance and expand the existing bicycle network by connecting gaps, addressing constrained areas, and providing for great local (to community centers, schools, parks, libraries, employment centers, and commercial centers) and regional connectivity.

The plan makes recommendations on bicycle network projects and improvements, prioritizing them into three categories: Short-term, Mid-term, and Long-term projects.

The Comprehensive Bicycle Development Plan identifies Class III bike routes along Constitution Drive as a mid-term project and Class II bike lanes along Marsh Road, between Bayfront Expressway and Bay Road, as a long-term project.

Transit Services

The study area is served directly by the *Marsh Road Shuttle* route, which provides free shuttle service between the Menlo Park Caltrain Station and the project area on weekdays. This service is available to the general public and runs along Middlefield Road, Marsh Road, Constitution Drive, Jefferson Drive, Chilco Street, and Bayfront Expressway with scheduled stops directly at the project site (at 150 Jefferson Drive). Four trips are made from the Menlo Park Caltrain Station to the project area between 6:58 and 9:25 AM, with the last trip arriving at the project site around 9:42 AM. Five trips are made in the afternoon/evening, with the stops at the project site scheduled for 2:27, 3:31, 4:09, 4:44, and 5:51 PM.

The existing Marsh Road Shuttle service would provide an alternative mode of access to the proposed school both locally (from the adjacent neighborhood areas) and regionally (via its connection to the Menlo Park Caltrain Station).

City of Menlo Park General Plan

The City of Menlo Park *General Plan* identifies various policies to promote the use of public transit. Some policies to achieve this goal include:

- The City shall consider transit modes in the design of transportation improvements and the review and approval of development projects.
- The City shall promote improved public transit service and increased transit ridership, especially to office and industrial areas and schools.

Proposed Transit Services

Various regional high-capacity long-term transit services are being proposed that would also serve the City of Menlo Park. These proposed services would enhance the existing transit services and improve connectivity between the City and other communities. The proposed regional transit services include:

Dumbarton Rail Service – this is the most significant planned high-capacity transit service in Menlo Park and it would connect Menlo Park to Union City across the San Francisco Bay.

Electrification of Caltrain – This project proposes to electrify the exiting Caltrain rail service between San Jose and San Francisco while providing the infrastructure needed for the proposed *High Speed Rail* project. Electrified rail service would permit faster speeds, improved travel times, reduced headways, and overall connectivity with regional transit systems. The *Peninsula Corridor Electrification Project* Final Environmental Impact Report (FEIR) was certified by Caltrans in January 2015.

Bus Rapid Transit (BRT) – This is another potential key transit improvement project that would provide BRT service along the El Camino Real corridor between Daly City and Palo Alto.

Other transit service improvements in Menlo Park include the expansion of local public and private shuttle services.

8. Conclusions

This study was conducted for the purpose of identifying the potential traffic impacts related to the proposed school project. The study includes an analysis of five signalized intersections, six unsignalized intersections, six local roadway segments, three CMP roadway segments, and one freeway interchange, all of them located within the City of Menlo Park. The study also includes a site access and on-site circulation analysis, and an evaluation of the proposed parking and drop-off and pick-up activities on-site.

The potential impacts related to the proposed school were evaluated following the standards and methodologies set forth by the City of Menlo Park, the City/County Association of Governments (C/CAG) of San Mateo County, and Caltrans. C/CAG administers the County Congestion Management Program (CMP) while Caltrans has jurisdiction over some of the study facilities. Project impacts on other transportation facilities, such as pedestrian facilities, bicycle facilities and transit, as well as the site access and circulation analyses were based on professional judgment in accordance with the standards and methods employed by the traffic engineering community.

Project Trip Generation Estimates

The trips generated by the proposed school were estimated based on trip generation counts conducted at Everest High School. Based on the surveyed rates, it is estimated that the proposed 100-student school would generate a total of approximately 88 trips (50 inbound and 38 outbound) during the AM peak hour and 51 trips (22 inbound and 29 outbound) during the PM peak hour while the 400-student school would generate a total of approximately 354 trips (202 inbound and 152 outbound) during the AM peak hour and 206 trips (91 inbound and 115 outbound) during the PM peak hour. This represents the peak-hour traffic projected to be generated by the proposed project (gross project trips) at the school's schools opening year (year 2018) and at full capacity (year 2021).

After reduction of the existing site trips, the proposed 100-student school is projected to generate a net total of 56 AM peak hour trips (25 inbound and 31 outbound) and 19 PM peak hour trips (10 inbound and 9 outbound) while the 400-student school project is estimated to generate a net total of 322 AM peak hour trips (177 inbound and 145 outbound) and 174 PM peak hour trips (79 inbound and 95 outbound).

Near Term Plus Project Conditions Analysis

Intersection levels of service were evaluated against City of Menlo Park and Caltrans Level of Service standards.

City of Menlo Park Intersections

The results of the level of service analysis show that, measured against the City of Menlo Park level of service policy, the proposed 100-student school scenario would have a negative impact on the following study intersections:

2. Constitution Drive and Independence Drive - (Impact - AM peak hour)
3. US 101 NB Ramps and Marsh Road - (Impact - AM & PM peak hours)
4. US 101 SB Ramps and Marsh Road – (Impact – AM peak hour)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
6. Constitution Drive and Chrysler Drive - (Impact - AM & PM peak hours)
7. Jefferson Drive and Chrysler Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - PM peak hour)
11. Constitution Drive and Chilco Street - (Impact - AM & PM peak hours)

The proposed 400-student school scenario would have a negative impact on the following study intersections:

2. Constitution Drive and Independence Drive - (Impact - AM peak hour)
3. US 101 NB Ramps and Marsh Road - (Impact - AM and PM peak hours)
4. US 101 SB Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
6. Constitution Drive and Chrysler Drive - (Impact - AM & PM peak hours)
7. Jefferson Drive and Chrysler Drive - (Impact - PM peak hour)
8. Independence Drive and Chrysler Drive - (Impact - PM peak hour)
9. Constitution Drive and Jefferson Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - PM peak hour)
11. Constitution Drive and Chilco Street - (Impact - AM & PM peak hours)

Caltrans Intersections

The results of the level of service analysis show that, measured against LOS D standard, the proposed 100-student school scenario would have a negative impact on the following Caltrans intersections:

1. Bayfront Expressway and Marsh Road - (Impact - AM peak hour)

The proposed 400-student school scenario would have a negative impact on the following Caltrans intersections:

1. Bayfront Expressway and Marsh Road - (Impact - AM & PM peak hours)
3. US 101 Northbound Ramps and Marsh Road - (Impact – AM & PM peak hours)
4. US 101 Southbound Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)

Intersection Mitigation Measures under 2018 and 2021 Project Conditions

Below is a brief description of the intersection impacts that are projected to occur under both project conditions scenarios analyzed and possible intersection mitigation improvements.

1. Bayfront Expressway and Marsh Road

Impact: Caltrans impact (project would increase intersection delay by 4 seconds or more during the AM peak hour under the 2018 project conditions scenario and during both peak hours under the 2021 project conditions scenario).

Mitigation: A potential mitigation measure at this intersection includes the addition of a third eastbound right-turn lane on Marsh Road and restriping the southbound through lane as a shared right-and-through lane. Since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

2. Constitution Drive and Independence Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the AM peak hour under both the 2018 and 2021 project conditions scenarios).

Mitigation: A potential mitigation measure at this intersection consists of prohibiting the northbound left-turn movement from Constitution Drive to westbound Independence Drive. Additional comprehensive analysis of this improvement is required in order to determine its feasibility. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*.**

3. US 101 Northbound Ramps and Marsh Road

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both the AM and PM peak hours under both the 2018 and 2021 project conditions scenarios).

Caltrans impact (project would increase intersection delay by 4 seconds or more during both the AM and PM peak hours under the 2021 project conditions scenario).

Mitigation: A potential mitigation measure at this intersection includes the widening of the northbound off-ramp to include a second northbound right-turn lane. Since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

4. US 101 Southbound Ramps and Marsh Road

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the AM peak-hour under the 2018 project conditions scenario and during both the AM and PM peak hours under the 2021 project conditions scenario).

Caltrans impact (the project would increase intersection delay by 4 seconds or more during both peak hours under the 2021 project conditions scenario).

Mitigation: A potential mitigation measure at this intersection includes the widening of the southbound off-ramp to add a second southbound right-turn lane, converting the existing southbound right-turn lane into a shared left-and-right turn lane, and widening Marsh Road to provide a third receiving lane. However, an improvement project of such magnitude could not feasibly be implemented by a single development project. Additionally, since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

5. Bayfront Expressway and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour under both the 2018 and 2021 project conditions scenarios).

Caltrans impact (the project would increase intersection delay by 4 seconds or more during the PM peak hour under the 2021 project conditions scenario).

Improvement: The proposed mitigation measure at this intersection consists of the addition of a third eastbound left-turn lane on Chrysler Drive onto northbound Bayfront Expressway. Since this intersection is under the jurisdiction of Caltrans, the City has not control over what improvements are implemented. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

6. Constitution Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both peak hours under both the 2018 and 2021 project conditions scenarios).

Mitigation: A potential mitigation measure at this intersection consists of the installation of a traffic signal, the addition of a separate left-turn lane on both approaches of Constitution Drive and the westbound approach on Chrysler Drive, and restriping the eastbound approach to include a share left-and-through and a share right-and-through lane. Additional comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*.**

7. Jefferson Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under both the 2018 and 2021 project conditions scenarios).

Mitigation: A potential mitigation measure at this intersection consists of the installation of a traffic signal. Additional comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*.**

8. Independence Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under the 2021 project conditions scenario).

Mitigation: A potential mitigation measure at this intersection consists of the addition of a separate left-turn lane on the southbound direction on Independence Drive and a separate right-turn lane on the westbound direction on Chrysler Drive. Additional comprehensive analysis of this improvement is required in order to determine its feasibility. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*.**

9. Constitution Drive and Jefferson Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour under the 2021 project conditions scenario).

Improvement: A potential mitigation measure at this intersection consists of the addition of a separate left-turn lane on the northbound approach on Constitution Drive. Implementation of the above improvements would improve the intersection operating conditions; however, the intersection would continue to operate at unacceptable level of service during the PM peak hour. There are no further feasible improvements available at this intersection. Therefore, the project impact at this intersection is deemed ***significant and unavoidable*****.**

10. Bayfront Expressway and Chilco Street

Impact: City of Menlo Park impact (the proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour under both the 2018 and 2021 project conditions scenarios).

Improvement: A potential mitigation measure at this intersection includes the addition of a second eastbound left-turn lane on Chilco Drive and converting the existing eastbound left-turn lane into a shared left-and-right turn lane. Since this intersection is under the jurisdiction of Caltrans, the City has no authority over the implementation of the improvements. Therefore, the project impact at this intersection is deemed ***significant and unavoidable***.

11. Constitution Drive and Chilco Street

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both peak hours under both the 2018 and 2021 project conditions scenarios).

Improvement: A potential mitigation measure at this intersection consists of the installation of a traffic signal and the addition of a separate left-turn lane on the southbound, eastbound, and westbound approaches and a separate right-turn lane on the northbound approach on Constitution Drive. Additional comprehensive analysis of the potential mitigation improvements is required in order to determine their feasibility. Since it is unknown whether the improvement would be implemented, the project impact at this intersection is deemed ***significant and unavoidable*****.**

City of Menlo Park Traffic Impact Fee Program

New development and redevelopment are subject to the TIFs. The TIFs may only be used for building new arterial streets, sidewalks, bicycle lanes, and other physical improvements to the City's multi-modal transportation network. All fees are paid in full to the City of Menlo Park before a building permit is issued. The TIF amount that development projects are subject to is determined, as stipulated by City ordinance (#964, Municipal Code Section 13.26), based on the project's PM peak hour trip generation. A set fee amount per PM peak hour trip, or per unit for specific land uses described in the *City of Menlo Park Traffic Impact Fee Program* document, dated August 2009 , must be paid by development projects to offset their project's impacts to the Citywide transportation network. The TIFs are adjusted annually, based on the ENR Construction Cost Index percentage for San Francisco.

By paying the TIF, a development project will have contributed their "fair share" to mitigate their project's impacts to the Citywide transportation system. However, if the development is also determined to result in an impact to specific roadway network facilities, in addition to the TIF, the development project may be conditioned to provide local transportation and streetscape improvements to mitigate the identified project impacts.

Near Term Plus Project Roadway Segment Analysis

The results of the roadway segment analysis show that, based on City of Menlo Park potential impact criteria for roadway segments, the proposed project would result in a potentially significant impact at the following roadway segments:

1. Jefferson Drive, south of Chrysler Drive
2. Chrysler Drive, between Jefferson Drive and Constitution Drive
3. Chrysler Drive, between Constitution Drive and Bayfront Expressway
4. Independence Drive, north of Chrysler Drive

Possible Roadway Improvements

Typical roadway network improvements focus in adding capacity to the facility in order to serve the projected increased in traffic volumes. However, the potential impacts to the above roadway segment are based on a designated daily traffic volume limit for the facility, which would not change with the addition of capacity to the roadway. In addition, increasing the capacity of the above roadways would require right-of-way acquisition, which would affect adjacent property owners and is considered unfeasible. Widening of roadways also could lead to other negative effects, such as induced travel demand (more people would be willing to drive rather than taking alternative transportation modes as a result of the increase roadway capacity), reduction in the use of alternative transportation modes, air quality degradation, increase in noise, and reduced safety for pedestrians and bicyclists (due to wider roadways and increased traffic volumes). Therefore, potential impacts on the above roadways are deemed ***significant and unavoidable***.

Although there are no feasible improvements to mitigate the potential roadway segment impacts, other possible improvements and efforts could be implemented to reduce the amount of project traffic added to the roadway segments. The improvements include the following:

- The project could contribute to the completion of planned bicycle facilities in the project area in an effort to encourage more students to bike to school. The City of Menlo Park *Comprehensive Bicycle Development Plan* identifies Class III bike routes along Constitution Drive. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.

  The project could contribute to the completion of planned sidewalk projects in the area that would close existing gaps in the sidewalk network and provide a continuous network connecting the project site to the adjacent neighborhoods. The City of Menlo Park *Sidewalk Master Plan* has identified the entire length of Jefferson Drive, as well as segments of Chrysler Drive, Constitution Drive, and Chilco Street, as priority (high ranking) streets for the installation of missing sidewalks. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.
- The City of Menlo Park, in conjunction with SamTrans, should consider adding bus services to directly serve the project area.
- The project should encourage students to walk, ride their bike, or take public transportation to school in an effort to reduce the amount of traffic generated by the proposed project.

Near Term Plus Project Routes of Regional Significance Analysis

The results of the routes of regional significance analysis show that the segment of Bayfront Expressway, northbound direction from Willow Road to US 101, is projected to operate at unacceptable LOS E during the AM peak hour under near term conditions. The proposed project is projected to add traffic to this segment representing less than 4% the segment's capacity. Therefore, based on CMP impact criteria, the proposed project would have an impact at this study route of regional significance.

Possible Route of Regional Significance Improvements

Typical roadway improvements consist in the widening of the roadway to add travel lanes and capacity to serve the projected increased in traffic volumes. However, the study Routes of Regional Significance are under the jurisdiction of Caltrans and the City has no authority over the implementation of improvements. Additionally, an improvement project of such magnitude could not feasibly be implemented by a single development project. Freeway and other state roadway projects are planned and funded on a regional scale. Therefore, potential impacts on the above Route of Regional Significance are deemed ***significant and unavoidable***.

Although there are no feasible improvements to mitigate the potential Routes of Regional Significance impacts, other possible improvements and efforts could be implemented to reduce the amount of project traffic added to these roadway segments. The improvements include the following:

- The project could contribute to the completion of planned bicycle facilities in the project area in an effort to encourage more students to bike to school. The City of Menlo Park *Comprehensive Bicycle Development Plan* identifies Class III bike routes along Constitution Drive. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.
- The project could contribute to the completion of planned sidewalk projects in the area that would close existing gaps in the sidewalk network and provide a continuous network connecting the project site to the adjacent neighborhoods. The City of Menlo Park *Sidewalk Master Plan* has identified the entire length of Jefferson Drive, as well as segments of Chrysler Drive, Constitution Drive, and Chilco Street, as priority (high ranking) streets for the installation of missing sidewalks. The contribution would be determined by the City of Menlo Park and it should be based on the project's contribution to the total projected growth within the study area.
- The City of Menlo Park, in conjunction with SamTrans, should consider adding bus services to directly serve the project area.
- The project should encourage students to walk, ride their bike, or take public transportation to school in an effort to reduce the amount of traffic generated by the proposed project.

Near Term Plus Project Freeway Ramp Analysis

Based on the calculated V/C ratios, the following freeway ramps were projected to operate at substandard levels under near term project conditions, based on Caltrans standards:

Northbound on-ramp from westbound Marsh Road (LOS F – AM & PM peak hours)
Southbound on-ramp from westbound Marsh Road (LOS E - PM peak hour)

Based on Caltrans impact criteria, the proposed project would have an impact at the above freeway ramps. The proposed project would add traffic to the above ramps representing no more than 5% of the ramps' capacity.

Possible Freeway Ramp Improvements

In order to improve the level of service conditions to acceptable levels at the study freeway ramps that are projected to be deficient under near term plus project conditions, the following measures can be implemented:

- Increase capacity on the deficient freeway ramps – This can be accomplished by providing a higher service rate (increase meter rate) at the metered on-ramps. However, this is a State facility and the City has no authority over its operations or improvements.
- Reduce project traffic on the deficient freeway ramps – Project traffic using the impacted freeway on-ramps could use alternative routes. However, it is possible that the displaced project traffic could have a negative impact at other facilities.

Cumulative Conditions Analysis

City of Menlo Park Intersections

The results of the level of service analysis show that, measured against the City of Menlo Park level of service policy, the proposed 400-student school project would have an negative impact on the following study intersections:

2. Constitution Drive and Independence Drive - (Impact - AM peak hour)
3. US 101 NB Ramps and Marsh Road - (Impact - AM and PM peak hours)
4. US 101 SB Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
6. Constitution Drive and Chrysler Drive - (Impact - AM & PM peak hours)
7. Jefferson Drive and Chrysler Drive - (Impact - PM peak hour)
8. Independence Drive and Chrysler Drive - (Impact - PM peak hour)
9. Constitution Drive and Jefferson Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - PM peak hour)
11. Constitution Drive and Chilco Street - (Impact - AM & PM peak hours)

Caltrans Intersections

The results of the level of service analysis show that, measured against LOS D standard, the proposed 400-student school project would have a negative impact on all five study Caltrans intersections:

1. Bayfront Expressway and Marsh Road - (Impact - AM & PM peak hours)
3. US 101 Northbound Ramps and Marsh Road - (Impact - AM & PM peak hours)
4. US 101 Southbound Ramps and Marsh Road - (Impact - AM & PM peak hours)
5. Bayfront Expressway and Chrysler Drive - (Impact - PM peak hour)
10. Bayfront Expressway and Chilco Street - (Impact - AM peak hour)

Intersection Mitigation Measures

Below is a brief description of the intersection impacts. Mitigation measures under cumulative conditions are the same as those described under near term project conditions.

1. Bayfront Expressway and Marsh Road

Impact: Caltrans impact (project would increase intersection delay by 4 seconds or more during both peak hours).

Mitigation: See description of mitigation measure under near term project conditions.

2. Constitution Drive and Independence Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the AM peak hour).

Mitigation: See description of mitigation measure under near term project conditions.

3. US 101 Northbound Ramps and Marsh Road

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both the AM and PM peak hours).

Caltrans impact (project would increase intersection delay by 4 seconds or more during both the AM and PM peak hours).

Mitigation: See description of mitigation measure under near term project conditions.

4. US 101 Southbound Ramps and Marsh Road

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both the AM and PM peak hours).

Caltrans impact (the project would increase intersection delay by 4 seconds or more during both the AM and PM peak hours).

Mitigation: See description of mitigation measure under near term project conditions.

5. Bayfront Expressway and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour).

Caltrans impact (the project would increase intersection delay by 4 seconds or more during the PM peak hour).

Improvement: See description of mitigation measure under near term project conditions.

6. Constitution Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both peak hours).

Mitigation: See description of mitigation measure under near term project conditions.

7. Jefferson Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour).

Mitigation: See description of mitigation measure under near term project conditions.

8. Independence Drive and Chrysler Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour).

Mitigation: See description of mitigation measure under near term project conditions.

9. Constitution Drive and Jefferson Drive

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during the PM peak hour).

Improvement: See description of mitigation measure under near term project conditions.

10. Bayfront Expressway and Chilco Street

Impact: City of Menlo Park impact (the proposed project is projected to increase the most critical delay on the local approaches of the intersection by more than 0.8 seconds during the PM peak hour).

Caltrans impact (the project would increase intersection delay by 4 seconds or more during the AM peak hour).

Improvement: See description of mitigation measure under near term project conditions.

11. Constitution Drive and Chilco Street

Impact: City of Menlo Park impact (the proposed project is projected to increase the intersection's critical movement delay by more than 0.8 seconds during both the AM and PM peak hours).

Improvement: See description of mitigation measure under near term project conditions.

Other Transportation Issues

Signal Warrant Analysis Results

The results of the signal warrant analysis show that traffic signals would be warranted at the following intersections under the noted scenarios:

6. Constitution Drive and Chrysler Drive - Near term (2018 and 2021), near term plus project, cumulative, cumulative plus project
7. Jefferson Drive and Chrysler Drive - near term (2021) plus project and cumulative plus project
11. Constitution Drive and Chilco Street - Near term (2018 and 2021), near term plus project, cumulative, cumulative plus project

Site Access and On-Site Circulation

Site Access

Recommendation: It is recommended that circulation within the site be designated as a one-way circulation (clockwise direction).

On-Site Circulation

The proposed layout of the access roadway/drive aisle, parking lot, and drop-off area provide for a convenient and effective vehicular on-site circulation. Some of the benefits of the proposed layout include:

- Two-lane access from the inbound (southern) driveway to the parking area. Providing two inbound lanes, the inner lane (lane next to the school campus) could serve as the drop-off lane, serving the drop-off area directly, while the second/outer lane would function as a bypass lane to serve all other non-drop-off traffic. Alternatively, both lanes could be utilized to serve the drop-off area and maximize the queue storage capacity within the site. This would provide twice the vehicle store capacity on-site to accommodate the expected drop-off queue, however, non-drop-off traffic would be forced to wait in the drop-off queue.
- Reduced conflict between vehicles parking and drop-off traffic by designating the inner inbound lane as the drop-off lane and the outer lane as the bypass lane. A bypass lane would allow vehicles wanting to park or exit the site to bypass the drop-off queue.

- Circulation within the site is simple and one-directional, with no dead ends or conflicting movements present.

Based on the proposed project site layout and aforementioned benefits, on-site circulation would be adequate.

Pedestrian Access and Circulation

Recommendation: It is recommended that the SUHSD works with the City of Menlo Park to develop a safe route to schools program that will define the safest routes for pedestrians between the adjacent residential areas and the project site.

Recommendation: The SUHSD could work with the City of Menlo Park to ensure pedestrian facilities in proximity to the project site are provided to the maximum extent possible. In particular, sidewalks along both sides of the entire extend of Jefferson Drive and along Chilco Street, which connects the project area with the Belle Haven neighborhood, are recommended.

Access Driveways Operations

Operations at the project driveways during drop-off times were evaluated.

Based on the CA MUTCD peak-hour traffic signal warrant (warrant #3), the projected peak-hour traffic volumes at the project driveways would fall below the thresholds that warrant signalization.

Additionally, level of service calculations at the project driveways project both driveways to operate at LOS A during both the AM and PM peak hours. The maximum queue length at the outbound driveway is projected to be approximately 4 vehicles during the AM peak hour while the maximum queue at the inbound driveway is projected to be about 2 to 3 vehicles in the northbound direction on Jefferson Drive during the AM peak hour.

Based on the results of the analysis, operations at the project driveways are projected to be adequate.

Sight Distance

Based on field observations and Caltrans requirements, the available sight distance at the outbound driveway on Jefferson Drive is adequate.

Recommendation: The design of the school campus should ensure design features, in particular the landscaping and signage along the school frontage, will not interfere with the sight distance at the proposed site driveways.

Emergency Vehicle and Truck Access

With the proposed parking lot layout, and adhering to City design standards and guidelines, emergency vehicle access and circulation within the project site should be adequate.

Parking

Based on the ITE rate, the proposed project would need to provide approximately 71 parking spaces (36 for students and 35 for staff/faculty members) to serve the average peak period, assuming a total of 400 high school students and 35 staff/faculty members. Based on this estimate, the proposed number of on-site parking spaces would not be sufficient to serve the estimated parking demand.

Based on the existing parking demand at East Palo Alto High School (parking generation rate of 0.17 spaces per student), it is estimated that at full capacity (400 students and 35 staff/faculty), the proposed school project would need to provide approximately 74 parking spaces to serve its projected demand. Based on this estimate, the proposed number of on-site parking spaces would not be sufficient to serve the estimated parking demand.

Americans with Disabilities Act Requirements

The project proposes to provide two accessible parking spaces, satisfying ADA requirements. The proposed accessible spaces are located across from a school entrance, along what seems to be the shortest accessible route.

Recommendation: It is recommended that the school work with the City and parents to develop parking alternatives and/or plans to reduce the number of students driving to the site. For example, the school could implement a permit parking program and limit the number of student parking permits issued, establish a carpool program, and/or provide incentive programs for students using alternative modes of transportation such as transit, biking, or walking to school.

Drop-Off and Pick-Up Activities

Proposed Drop-off Circulation

Assuming one of the inbound lanes would be the designated drop-off lane, plus the drop-off area, a total of approximately 480 feet of queue storage capacity would be provided within the project site. Assuming an average of 25 feet of queue storage is needed per vehicle, the proposed queue storage space could accommodate up to 19 vehicles on site, 8-9 of which would be within the drop-off area.

The expected queue length within the drop-off lane was estimated using Poisson’s probability distribution and based on the estimated inbound trip generation during the AM peak hour, which is the highest for the school. Estimating the queue length for the drop-off area based on the total number of vehicles entering the site in the morning is an extremely conservative analysis since some of those trips would be made by students/staff parking on site, and therefore, would not be included on the drop-off queue.

Using Poisson’s probability and assuming a steady stream of inbound traffic, it is estimated that a maximum of 2 vehicles would be queued up beyond the drop-off area at a given time during the peak 30-minute period. Assuming that the student drop-offs would occur within the 15 minutes prior to the beginning of the school day, the maximum queue length extending beyond the drop-off area would be approximately 4 vehicles. Therefore, the proposed vehicle queue storage capacity within the site is estimated to be adequate to serve the projected vehicular queue length.

Pedestrian Facilities

Based on student mode of access information provided by school staff, it was calculated that approximately 25% and 35% of the existing students at Everest and East Palo Alto High Schools, respectively, walk, ride their bike, or take public transportation to school. Both of these schools are located within residential neighborhoods that make it more accessible for students to use other modes of access besides the passenger vehicle. Since the proposed school site is located within an industrial area, the percentage of students walking/biking/taking transit may be lower.

As partial mitigation to their projected traffic impacts, the Commonwealth Corporate Center project plans to install sidewalks along the frontage at 138 and 160 Jefferson Drive and along both the Jefferson Drive and Chrysler Drive frontage at 1150 Chrysler Drive. Additionally, the Commonwealth project plans to install ADA-compliant pedestrian curb ramps across the Jefferson Drive leg of the Jefferson Drive/ Chrysler Drive intersection and across the east leg of Chrysler Drive at the Independence Drive/Chrysler Drive intersection.

The above planned improvements will help close gaps in the existing sidewalk network in the immediate vicinity of the project site.

City of Menlo Park General Plan

The City of Menlo Park *General Plan* identifies various policies to promote walking as an alternative mode of access for short trips. Some policies to achieve this goal include:

- The City shall require all new development to incorporate safe and attractive pedestrian facilities on-site.
- The City shall incorporate appropriate pedestrian facilities, traffic control, and street lighting within street improvement projects to maintain or improve pedestrian safety.
- The City shall prepare a safe school route program to enhance the safety of school children who walk to school.

City of Menlo Park Sidewalk Master Plan

The *2009 City of Menlo Park Sidewalk Master Plan* was developed to serve as a guideline for the allocation of capital, maintenance, administration, and matching funds for sidewalk facilities. The primary purpose of the plan is to prioritize sidewalk installation by providing an inventory of existing gaps in the City's sidewalk network. Priority streets are identified as those roadways that provide network connectivity and access to important pedestrian destinations, such as schools, parks ,and the downtown area. Roadway segments with missing sideways throughout the City were ranked into three categories: high, medium, and low ranking. The entire length of Jefferson Drive, as well as segments of Chrysler Drive, Constitution Drive, and Chilco Street have been identified in the Sidewalk Master Plan as high ranking segments.

City of Menlo Park Complete Streets Policy

The *2013 Complete Streets Policy* of the City of Menlo Park expresses the City's desire and commitment to create and maintain streets that provided safe, comfortable, and convenient travel for all users and abilities through a comprehensive, integrated transportation network. The policy calls for City agencies to work towards making Complete Streets practice a routine of everyday operations, project approach, and programs. Complete streets infrastructure should be considered in all planning, funding, design, approval, and implementation of any significant construction, reconstruction, or alteration of streets within the City. Possible improvements include sidewalks, bicycle facilities, paved shoulders, landscaping, accessible curb ramps, crosswalks, pedestrian signal heads, and public transit stops, among others.

Bicycle Facilities

No bicycle facilities are currently provided in the immediate vicinity of the project site.

Based on student mode of access information provided by school staff, it was calculated that approximately 5% and 3% of the existing students at Everest and East Palo Alto High Schools, respectively, ride their bike to school. Conservatively assuming that up to 5% of the proposed school students would ride their bike to school, this represents approximately 20 students riding their bike to the site. Since no bicycle facilities are currently provided in the immediate vicinity of the project site, the estimated 20 students riding their bike to school would share the roadway with vehicular traffic.

The City of Menlo Park General Plan identifies bicycle parking requirements for different land uses. However, no requirements are specified for schools. Nevertheless, and anticipating that some of the students would ride their bike to school, the school is proposing to provide bicycle racks on site. Based on the above estimate, the school should try to provide a minimum of 20 bicycle parking spaces on-site.

City of Menlo Park General Plan

The City of Menlo Park *General Plan* identifies various policies to promote the safe use of bicycle travel as a commute alternative and for recreation. Some policies to achieve this goal include:

- The City shall, within available funding, work to complete a system of bikeways within Menlo Park.
- The City shall encourage transit providers within San Mateo County to provide improved bicycle access to transit including secure storage at transit stations and on-board storage where feasible.

City of Menlo Park Comprehensive Bicycle Development Plan

The *2005 Menlo Park Comprehensive Bicycle Development Plan* provides a blueprint for a citywide system of bike lanes, bike routes, bike paths, bicycle parking, and other related facilities to allow for safe, efficient and convenient bicycle travel within the City. The purpose of the plan is to enhance and expand the existing bicycle network by connecting gaps, addressing constrained areas, and providing for great local (to community centers, schools, parks, libraries, employment centers, and commercial centers) and regional connectivity.

The plan makes recommendations on bicycle network projects and improvements, prioritizing them into three categories: Short-term, Mid-term, and Long-term projects.

The Comprehensive Bicycle Development Plan identifies Class III bike routes along Constitution Drive as a mid-term project and Class II bike lanes along Marsh Road, between Bayfront Expressway and Bay Road, as a long-term project.

Transit Services

The study area is served directly by the *Marsh Road Shuttle* route, which provides free shuttle service between the Menlo Park Caltrain Station and the project area on weekdays. This service is available to the general public and runs along Middlefield Road, Marsh Road, Constitution Drive, Jefferson Drive, Chilco Street, and Bayfront Expressway with scheduled stops directly at the project site (at 150 Jefferson Drive). Four trips are made from the Menlo Park Caltrain Station to the project area between 6:58 and 9:25 AM, with the last trip arriving at the project site around 9:42 AM. Five trips are made in the afternoon/evening, with the stops at the project site scheduled for 2:27, 3:31, 4:09, 4:44, and 5:51 PM.

The existing Marsh Road Shuttle service would provide an alternative mode of access to the proposed school both locally (from the adjacent neighborhood areas) and regionally (via its connection to the Menlo Park Caltrain Station).

City of Menlo Park General Plan

The City of Menlo Park *General Plan* identifies various policies to promote the use of public transit. Some policies to achieve this goal include:

- The City shall consider transit modes in the design of transportation improvements and the review and approval of development projects.
- The City shall promote improved public transit service and increased transit ridership, especially to office and industrial areas and schools.

APPENDIX D:

APRIL 2015 HEALTH RISK ASSESSMENT

Date:	April 27, 2015
Project No.:	166-14-5
Prepared For:	Ms. Louise Pacheco **SEQUOIA UNION HIGH SCHOOL DISTRICT** 480 James Avenue Redwood City, CA 94062
Re:	150 Jefferson Drive Menlo Park, California

Dear Ms. Pacheco:

This letter presents the findings of certain components of the California Department of Education (CDE) Environmental Hazards Checklist for 150 Jefferson Drive in Menlo Park, California (Site). The Environmental Hazards Checklist is used by CDE's School Facilities Planning Division (SFPD) staff to help evaluate a property for potential school use. This work was performed for Sequoia Union High School District (District) in accordance with our Agreement dated March 12, 2015.

Project Background

The approximately 2.17-acre property is located at 150 Jefferson Drive in Menlo Park and is currently occupied with an asphalt pavement parking lot and warehouse building. The District recently purchased the property for school use and intends to seek matching state funds for the proposed school development. Prior studies performed at the Site by Cornerstone Earth Group (Cornerstone) have included a Phase I Environmental Site Assessment (Cornerstone, November 2014), Soil , Soil Vapor, and Ground Water Quality Evaluation Report (Cornerstone, December 2014), Preliminary Geotechnical Investigation (Cornerstone, December 2014), and a Pipeline Safety Hazard Assessment (Placeworks, January 2015). Please refer directly to these reports for an overview of the Site and to help address other components of CDE's Environmental Checklist.

Environmental Services

Health Risk Assessment

Our sub-consultant performed a Health Risk Assessment (HRA) that included a characterization of emission sources located within an approximate ¼-mile radius (1,320 feet) of the Site that may reasonably be anticipated to emit hazardous air emissions (i.e., sources). The HRA involved conducting the following tasks:

- A screening evaluation of mobile emission sources associated with vehicles and trucks traveling on highways and high volume roadways with annual average daily traffic volumes exceeding 10,000 vehicles per day. Identified highways within a quarter-mile radius of the Site include Highway 101 and Highway 84/Bayfront Expressway. No additional high volume roadways were identified within a quarter-mile radius of the Site.

- Identifying and performing a screening evaluation of permitted and non-permitted stationary facilities within a quarter-mile radius of the Site that might reasonably emit hazardous or acutely hazardous air emissions.

- Adjusting the screening health risk values for stationary and mobile sources to account for the school-based receptors (e.g. staff and students), as the Bay Area Air Quality Management District's (BAAQMD) screening tools are based on residential receptors.

- Preparing a health risk assessment report that compares the calculated risks with thresholds established by the BAAQMD and the Office of Environmental Health Hazard Assessment (OEHHA).

The results of the health risk assessment from individual emission sources indicate that the excess cancer risk from each individual stationary and mobile source within an approximate ¼ mile from the Site is less than the BAAQMD threshold of 10 in a million for a lifetime cancer risk and less than the noncarcinogenic chronic and acute hazard indexes of 1.0. The $PM_{2.5}$ concentrations for all individual emission sources are below the BAAQMD significance threshold of 0.3 $\mu g/m^3$. In addition, the cumulative health risks from all evaluated emission sources are below BAAQMD's cumulative significance thresholds. Based on a comparison to the carcinogenic and non-carcinogenic thresholds established by OEHHA and BAAQMD, hazardous air emissions generated from the stationary and mobile sources within a ¼ mile radius are not anticipated to pose an actual or potential endangerment to students and staff occupying the Site. No mitigation measures appear required.

A complete copy of the HRA report is attached and should be reviewed for further details.

Power Lines

Title 5 Section 14010(c) of the California Code of Regulations requires that proposed school facilities meet minimum setback requirements from all power transmission lines rated at 50 kilovolts (kV) and above. The property line of the Site must be at least the following distance from the boundary line of respective power line easements: 100 feet for 50 to133 kV line, 150 feet for 220 to 230 kV line, and 350 feet for 500 to 550 kV line.

To help identify the presence of transmission power lines within an approximate 350 foot radius of the Site, we contacted Pacific Gas & Electric and requested readily available public information on power lines near the Site. A representative from PG&E responded to our request and indicated there are no nearby PG&E electric transmission lines 50kV or greater.

Railroad lines

A former Union Pacific (UP) railroad line is located approximately 1,000 feet south of the Site. Based on our review of available on-line information sources[1], Caltrain reportedly purchased the line from UP for the Dumbarton Rail Project; however, the project reportedly is on indefinite hold and the funding is being used for other projects. We understand there is no current train traffic associated with the line although Caltrain reportedly is using some portions of the track to store work train equipment. Based on this information, the likelihood of there being future train traffic in the vicinity of the school Site appears low. Thus, a rail safety study does not appear needed.

Closing

This letter, an instrument of professional service, was prepared for the sole use of the Sequoia Union High School District and may not be reproduced or distributed without written authorization from Cornerstone. 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.

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.

Kurt Soenen

Kurt M. Soenen, P.E.
Principal Engineer

Copies: Addressee (1 by email)
Attachment: Human Health Risk Assessment

[1] Federal Railroad Administration – Office of Safety Analysis, 2015. Crossing Inventory for Bayshore Freeway and Marsh Road. Accessed at http://safetydata.fra.dot.gov/officeofsafety/publicsite/crossing/xingqryloc.aspx

Green Caltrain, 2015. *Dumbarton Rail going on hold.* Project on indefinite hold after failure of transportation sales tax measure to pass. Funds for the project were slated for reallocation to BART extension projects. Accessed at: http://www.greencaltrain.com/2013/10/dumbarton-rail-going-on-hold/

Health Risk Assessment | April 2015

New School Site in Menlo Park

for Sequoia Union High School District

Prepared for:

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List of Appendices

Appendix A. Screening Analysis
Appendix B. Risk Calculation Worksheets

1. Introduction

The Sequoia Union High School District (District) is proposing to construct a new high school on an approximately 2-acre parcel located at 150 Jefferson Drive in the City of Menlo Park, San Mateo County, California. The property is bounded on the north by Jefferson Drive and on the east, south, and west by commercial/manufacturing land uses.

Regulations pertaining to the siting of new schools or modernization of existing schools in California require compliance with the California Code of Regulations (CCR) Title 5 standards. For new schools, Title 5 studies must demonstrate that facilities with the potential to emit hazardous air pollutants within a quarter-mile radius of the school site will not constitute an actual or potential public health risk to students and staff that will attend the school. This health risk assessment (HRA) involved conducting the following tasks:

- A screening evaluation of mobile emission sources associated with vehicles and trucks traveling on highways and high volume roadways with annual average daily traffic volumes exceeding 10,000 vehicles per day. Identified highways within a quarter-mile radius of the Site include Highway 101 and Highway 84/Bayfront Expressway. No additional high volume roadways were identified within a quarter-mile radius of the Project site.

- Identifying and performing a screening evaluation of all permitted and non-permitted stationary facilities within a quarter-mile radius of the Project site that might reasonably emit hazardous or acutely hazardous air emissions.

- Adjusting the screening health risk values for stationary and mobile sources to account for the school-based receptors (e.g. staff and students), as the Bay Area Air Quality Management District's (BAAQMD) screening tools are based on residential receptors.

- Preparing a health risk assessment report that compares the calculated risks with thresholds established by the BAAQMD and the Office of Environmental Health Hazard Assessment (OEHHA).

The assessment and dispersion modeling methodologies used in the preparation of this report included all relevant and appropriate procedures developed by the US Environmental Protection Agency (USEPA) and OEHHA. These methodologies and assumptions were used to ensure that the assessment effectively quantified school-based impacts associated with emission sources.

1. Introduction

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2. Project Description

The proposed Project is located on a 2-acre parcel located at 150 Jefferson Drive in Menlo Park, California. Construction of a high school is anticipated to be completed in 2018. The proposed school site is bounded by Jefferson Drive to the north, and east, south, and west by commercial/manufacturing properties. Highway 101 is located approximately 500 feet southwest of the site. The Bayfront Park Landfill is located approximately 1,100 feet north of the site, beyond Highway 84/Bayfront Expressway.

The Project site and vicinity are depicted in Figure 1.

2. Project Description

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Figure 1 - Site Location

Site Boundary

0 1,300 Scale (Feet)

Source: Google Earth Pro, 2014

2. Project Description

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3. Source Identification

BAAQMD has developed screening analysis tools for identifying stationary and mobile sources within the vicinity of a proposed project. Additionally, properties within a quarter-mile radius of the site were surveyed to identify facilities that have the potential to generate hazardous air emissions. Two highways and six active stationary sources were identified within a quarter-mile of the site and are listed in Table 1. No additional high volume roadways (average annual daily traffic counts in excess of 10,000 vehicles per day) and no non-permitted stationary sources were identified within a quarter-mile of the site.

A summary of the emissions sources evaluated for this assessment is provided below in Table 1.

Table 1 Emission Sources

Source	Address
Highway 101	500 feet southwest of the Project
Highway 84/Bayfront Expressway	900 feet northeast of the Project
L-3 Communications Randtron Antenna Systems	130 Constitution Drive, Menlo Park, CA 94025
ECI Painting Inc.	165 Constitution Drive, Menlo Park, CA 94025
Geron	230 Constitution Drive, Menlo Park, CA 94025
InfoImage	141 Jefferson Drive, Menlo Park, CA 94025
City of Menlo Park - Bayfront Park Landfill	Marsh Road, north of Highway 84, Menlo Park, CA 94025
Latham and Watkins	140 Scott Drive, Menlo Park, CA 94025

The proposed school site and emission sources are depicted in Figure 2.

3. Source Identification

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Figure 2 - Emission Sources

Site Boundary
1/4-Mile Radius

1 Highway 101
2 Highway 84/Bayfront Expressway
3 L-3 Communications
4 ECI Painting Inc.
5 Geron
6 InfoImage
7 City of Menlo Park
8 Latham and Watkins

0 750
Scale (Feet)

Source: Google Earth Pro, 2014

3. Source Identification

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4. Screening Health Risk Values

4.1 MOBILE SOURCES

Mobile sources within a quarter-mile of the Project site were identified using BAAQMD's Highway Screening Analysis Tools (BAAQMD, 2011) and the traffic volume linkage tool from the California Environmental Health Tracking Program (CEHTP, 2007). Two highways (Highway 101 and Highway 84/Bayfront Expressway) were identified; no additional roadways with 10,000 or more vehicles/day were found. The BAAQMD Highway Screening Analysis Tools provided screening level health risk and hazard values for residential receptors, based on the distance of the Project site from the highway segment. The residential screening health risk values for each highway segment considered in the assessment are summarized in Table 2. The calculations and residential screening health risk values are also provided in Table B1 of Appendix B.

Table 2 Highway Screening Health Risk Values – Residential Exposure Scenario

Source - Segment	Distance from Project (ft)	Cancer Risk (per million)	Chronic Hazard Index	Acute Hazard Index	$PM_{2.5}$ (µg/m^3)
Highway 101 – Link 23	500	**15.5**	0.015	0.016	0.15
Highway 84/Bayfront Expressway – Link 22	900	1.46	0.001	0.004	0.02
BAAQMD Significance Threshold - Individual Source		10	1.0	1.0	1.0
Exceeds Threshold?		**Yes**	No	No	No

Source: BAAQMD Highway Screening Analysis Tool for San Mateo County (2011), for first floor receptors (6-feet).

For Highway 101, the screening level cancer risk for residential receptors exceed BAAQMD's significance threshold. To determine school-based screening cancer risks, the residential-based screening cancer risks were adjusted based on the difference in exposure duration, age sensitivity, and breathing rates between residences and school-based receptors, as discussed in more detail in Chapters 5 and 6.

4.2 STATIONARY SOURCES

Stationary sources within a quarter-mile of the Project site were identified using BAAQMD's Stationary Source Screening Analysis Tools (BAAQMD, 2012). The BAAQMD Screening Analysis Tools provided screening level health risk and hazard values for residential receptors, as well as screening multipliers to adjust risk values for diesel generators based on distance from the source. Six active stationary sources, and two recently closed facilities, were identified including industrial or light manufacturing facilities. Detailed facility emissions information and residential screening health risk values received from BAAQMD are also provided in Appendix A.

For the six stationary sources, screening level risk values were used for three of the sources. For InfoImage and Latham & Watkins (sources 6 and 8, respectively), the BAAQMD's diesel engine multiplier tool was used

4. Screening Health Risk Values

to adjust the screening level risk values to account for distance of the facility's emergency generator from the Project site. For L-3 Communications Randtron Antenna Systems (Source 3), the screening level risk values were adjusted using BAAQMD's Beta Calculator tool and the diesel engine multiplier tool. For Geron (Source 5), the risk values provided by BAAQMD in the Health Risk Screening Analysis (HRSA) were used. For the City of Menlo Park Bayfront Park Landfill (Source 7), BAAQMD's Beta Calculator tool was used to determine the screening level values. The residential screening health risk values for each stationary source considered in the assessment are summarized in Table 3. The calculations and residential screening health risk values are also provided in Table B2 of Appendix B.

Table 3 Stationary Source Screening Health Risk Values – Residential Exposure Scenario

Source	Distance to Project (feet)	Cancer Risk (per million)	Chronic Hazard Index	Acute Hazard Index	$PM_{2.5}$ ($\mu g/m^3$)
L-3 Communications Randtron [1]	650	0.43	<0.001	0.002	0.001
ECI Painting, Inc.	570	0.001	0.00	n/a	0.005
Geron [2]	850	0.34	<0.001	n/a	0.001
InfoImage [3]	80	3.48	0.001	n/a	0.001
City of Menlo Park [4]	1,000	5.69	0.41	0.96	0.00
Latham & Watkins [3]	1,100	0.71	<0.001	n/a	0.004
BAAQMD Significance Threshold - Individual Source		10	1.0	1.0	0.3
Exceeds Threshold?		No	No	No	No

Source: BAAQMD Stationary Source Screening Analysis Tool (2012).
Note: Acute Hazards Index information not provided by BAAQMD's screening tools for stationary sources. Acute Hazards were determined only for stationary sources which required additional evaluation (e.g. L-3 Communications Randtron and City of Menlo Park).
[1] BAAQMD's Beta Calculator 1.3 and Diesel IC Engine Distance Multiplier Tool (2012) were used to determine the screening level health risk values.
[2] Health Risk Screening Analysis (HRSA) information from BAAQMD was used to determine the screening level health risk values.
[3] BAAQMD's Diesel IC Engine Distance Multiplier Tool (2012) was used to adjust the screening level health risk values.
[4] BAAQMD's Beta Calculator 1.3 was used to determine the screening level health risk values.

The screening health risk values for all six stationary sources are below the BAAQMD significance thresholds for individual health risks (10 in a million excess cancer risk, 1.0 chronic and acute hazard indexes, or $PM_{2.5}$ concentration greater than 0.3 $\mu g/m^3$). Therefore, additional analysis is not necessary for these sources. However for consistency with the analysis of mobile sources, the residential screening health risk values were adjusted to school-based screening values based on the difference in exposure duration, age sensitivity, and breathing rates between residences and school-based receptors, as discussed in further detail in Chapters 5 and 6.

5. Risk Characterization

5.1 CARCINOGENIC CHEMICAL RISK METHODOLOGY

Carcinogenic compounds are not considered to have threshold levels (i.e., dose levels below which there are no risks). Any exposure, therefore, will have some associated risk. The Office of Environmental Health Hazard Assessment (OEHHA) defines a typical risk management level as 10 in a million (10E-06; OEHHA, 2015). In addition, the State of California has established a threshold of one in one hundred thousand (1.0E–05 or 10 in a million) as a level posing no significant risk for exposures to carcinogens regulated under the Safe Drinking Water and Toxic Enforcement Act (Proposition 65).

Under CEQA guidance, BAAQMD has developed thresholds of significance for air pollutants emitted from individual sources and for cumulative exposures of multiple sources. Although BAAQMD is currently not implementing the use of these significance thresholds pending the resolution of ongoing litigation, lead agencies may continue to rely on the use of these thresholds to determine the significance of a project's air quality impacts. For this assessment, the 2011 BAAQMD significance thresholds were used to determine potential health impacts.

Project-level emissions of TACs or $PM_{2.5}$ from individual sources within a quarter-mile of the Site that exceed any of the thresholds listed below are considered a potentially significant community health risk:

a) An excess cancer risk level of more than 10 in one million, or a non-cancer (i.e., chronic or acute) hazard index greater than 1.0

b) An incremental increase of greater than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$ from a single source

Cumulative sources represent the combined total risk values of each of the individual sources within the quarter-mile evaluation zone. A project would have a cumulatively considerable impact if the aggregate total of all past, present, and foreseeable future sources within a quarter-mile radius from the fence line of a source or location of a receptor, plus the contribution from the Site, exceeds the following:

c) An excess cancer risk level of more than 100 in one million, or a non-cancer (i.e., chronic or acute) hazard index (from all local sources) greater than 10.0; or

d) An incremental increase of greater than 0.8 $\mu g/m^3$ annual average $PM_{2.5}$.

Health risks associated with exposure to carcinogenic compounds at the proposed Project site can be defined in terms of the probability of developing cancer as a result of exposure to a chemical at a given concentration. Under a deterministic approach (i.e., point estimate methodology), the cancer risk probability is determined by multiplying the chemical's annual concentration by its unit risk factor (URF), a measure of the carcinogenic potential of a chemical when a dose is received through the inhalation pathway. It is an upper-limit estimate of the probability of contracting cancer as a result of continuous exposure to an ambient concentration of one microgram per cubic meter (µg/m^3) over a lifetime of 70 years.

Recent guidance from OEHHA recommends a refinement to the standard point estimate approach with the use of age-specific breathing rates and age sensitivity factors (ASFs) to assess risk for susceptible subpopulations such as children. For the inhalation pathway, the procedure requires the incorporation of several discrete variates to effectively quantify dose for each age group. Once determined, contaminant dose is multiplied by the cancer potency factor in units of inverse dose expressed in milligrams per kilogram per day (mg/kg/day)$^{-1}$ to derive the cancer risk estimate. The inhalation dose is calculated using the following equation (Equation 1):

$$\text{Equation 1:} \qquad \text{Dose}_{\text{AIR}} = (\text{C}_{\text{air}} \times \text{EF} \times [\frac{\text{BR}}{\text{BW}}] \times \text{A} \times \text{CF})$$

Where:

Dose_{AIR}	=	dose by inhalation (mg/kg-day)
C_{air}	=	concentration of contaminant in air (µg/m^3)
EF	=	exposure frequency (number of days/365 days)
BR/BW	=	daily breathing rate normalized to body weight (L/kg-day)
A	=	inhalation absorption factor (default = 1)
CF	=	conversion factor (1x10^{-6}, µg to mg, L to m^3)

The inhalation absorption factor (A) is a unitless factor that is only used if the cancer potency factor included a correction for absorption across the lung. For this assessment, the default value of 1 was used. The overall cancer risk is calculated using the following equation (Equation 2):

$$\text{Equation 2:} \qquad \text{Cancer Risk}_{\text{AIR}} = \text{Dose}_{\text{AIR}} \times \text{CPF} \times \text{ASF} \times \frac{\text{ED}}{AT}$$

Where:

Dose_{AIR}	=	dose by inhalation (mg/kg-day
CPF	=	cancer potency factor, chemical-specific (mg/kg-day)$^{-1}$
ASF	=	age sensitivity factor
ED	=	exposure duration (years)
AT	=	averaging time period over which exposure duration is averaged (always 70 years)

Typically, the URFs used in risk assessments and corresponding cancer potency factors are obtained principally from OEHHA guidance. The final step converts the cancer risk in scientific notation to a whole number that expresses the cancer risk in "chances per million" by multiplying the cancer risk by a factor of 1x10^6 (i.e. 1 million).

5.2 ADJUSTING CARNICOGENIC RISK FOR SCHOOL BASED RECEPTORS

As the screening level cancer risk values obtained from BAAQMD's screening tools are for residential receptors, the values need to be adjusted to determine the appropriate cancer risk values for school-based receptors. Specifically, school-based receptors would have different breathing rates per body weight, age sensitivity factors, exposure durations, and exposure frequencies than residential receptors. The different screening factors for each receptor type are presented in Table 4.

Table 4 Cancer Risk Factors for Various Receptor Types

Screening Factor	Resident [1]	School-Based Factors [2]		Unit
		Staff	Students	
Breathing Rate/Body Weight	302	230	520	L/kg-day
Age Sensitivity	1.7	1	3 (high school)	unitless
Exposure Duration	70	25 (worker)	4 (high school)	years
Exposure Frequency	350	240	180	days/year

Source: BAAQMD *Recommended Methods for Screening and Modeling Local Risks and Hazards* (2012) and OEHHA *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (2015).
[1] BAAQMD's screening tools for mobile and stationary sources utilize the following factors to determine the screening level health risks.
[2] New OEHHA Guidelines (2015) using 95th percentile 8-hour breathing rates (moderate intensity activity), age sensitivity factors, and worker and student exposure durations are used to estimate the school-based screening risk values.

To adjust the screening cancer risk values, the contaminant concentration in air was back-calculated and then the cancer risk value was recalculated using the school-based screening factors presented in Table 4. The inhalation dosage and contaminant concentration in air can be back-calculated using Equations 1 and 2, respectively. To simplify the calculations, diesel particulate matter (DPM) with a cancer potency factor of 1.1 $(mg/kg\text{-}day)^{-1}$ was used as a surrogate contaminant to represent 100 percent of toxic air contaminant emissions from each source. The 95th percentile 8-hour breathing rates for moderate intensity activity were used for the school population (OEHHA, 2015). Lifetime risk values for the high school student population were adjusted to account for an exposure of 180 days per year for 4 years. In addition, the calculated risk for students is multiplied by an ASF weighting factor of 3 (for children ages 2 to 16) to account for early life sensitivity to pollutant exposures (OEHHA, 2015). To assess staff-related risk, exposures were adjusted to account for an employment period of 240 days per year for 25 years. This timeline is considered appropriate for potential workplace exposures established by OEHHA (2015).

Appendix B, Tables B1 and B2, presents the adjusted screening level cancer risk values for mobile and stationary sources.

5.3 NON-CARCINOGENIC HAZARDS METHODOLOGY

Under the point estimate approach, adverse health effects are evaluated by comparing the annual ground level concentration of each chemical compound with the appropriate Reference Exposure Level (REL). Typically, available RELs promulgated by OEHHA are considered in risk assessments.

To quantify non-carcinogenic impacts, the hazard index approach was used. The hazard index assumes that chronic sub-threshold exposures adversely affect a specific organ or organ system (toxicological endpoint). For each discrete chemical exposure, target organs presented in regulatory guidance were used. To calculate the hazard index, each chemical concentration or dose is divided by the appropriate toxicity value. For compounds affecting the same toxicological endpoint, this ratio is summed. Where the total equals or exceeds one, a health hazard is presumed to exist. In a manner consistent with the assessment of carcinogenic exposures, REL/RfC values were converted to units expressed in mg/kg/day to accommodate the above intake algorithm.

Appendix B, Tables B1 and B2, present the screening level non-cancer hazard quotient for each source. As the determination of the non-cancer hazard quotient is independent of receptor-specific screening factors, the non-cancer hazard index values do not need to be adjusted for school-based receptors.

5.4 CRITERIA POLLUTANTS METHODOLOGY

The BAAQMD has recently incorporated $PM_{2.5}$ into the District's CEQA significance thresholds due to recent studies that show adverse health impacts from exposure to this pollutant. An incremental increase for the annual average $PM_{2.5}$ concentration of more than 0.3 $\mu g/m^3$ is considered to be a significant impact. Appendix B, Tables B1 and B2, present the $PM_{2.5}$ maximum annual concentrations for each emission source. As the $PM_{2.5}$ maximum annual concentrations are independent of receptor-specific screening factors, the $PM_{2.5}$ maximum annual concentrations do not need to be adjusted for school-based receptors.

5.5 ACCIDENTAL RELEASES

Under the auspices of the California Accidental Release Prevention (CalARP) Program, should a stationary source use more than a threshold quantity of a regulated hazardous substance, a Risk Management Plan (RMP) which includes a risk assessment of accidental releases is required to be conducted pursuant to the provisions of the federal Accidental Release Prevention program (Title 40, Code of Federal Regulations, Part 68) Article 2, Chapter 6.95 of the Health and Safety Code.

A review of the available information collected during the source identification process (e.g., regulatory records review and on-site interviews with business owner/operators) did not reveal the presence of any CalARP program facilities within a quarter-mile of the Project site.

6. Adjusted Screening Health Risk Values

6.1 MOBILE SOURCES

For mobile sources, the adjusted screening health risk values for school-based receptors are shown in Table 5. The mobile source screening health risk values, adjusted for school-based receptors, do not exceed BAAQMD's significance threshold for individual sources.

Table 5 Highways Screening Health Risk Values – School-Based Exposure Scenario

Source - Segment	Cancer Risk - Staff (per million)	Cancer Risk - Students (per million)	Chronic Hazard Index	Acute Hazard Index	$PM_{2.5}$ ($\mu g/m^3$)
Highway 101 – Link 23	1.70	1.38	0.015	0.016	0.15
Highway 84/Bayfront Expressway – Link 22	0.16	0.13	0.001	0.004	0.02
BAAQMD Significance Threshold – Individual Source	10	10	1.0	1.0	0.3
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**

Source: BAAQMD Highway Screening Analysis Tool for San Mateo County (2011), for first floor receptors (6-feet) and adjusted for school-based receptors.

6.2 STATIONARY SOURCES

For stationary sources, the adjusted screening health risk values for school-based receptors are shown in Table 6. Similar to the residential-based screening health risk values presented in Chapter 4, the screening health risk values adjusted for school-based receptors do not exceed BAAQMD's significance threshold for individual stationary sources.

6. Adjusted Screening Health Risk Values

Table 6 Stationary Source Screening Health Risk Values – School-Based Exposure Scenario

Source	Cancer Risk - Staff (per million)	Cancer Risk - Students (per million)	Chronic Hazard Index	Acute Hazard Index	$PM_{2.5}$ (µg/m³)
L-3 Communications Randtron [1]	0.05	0.04	<0.001	0.002	0.001
ECI Painting, Inc.	<0.001	<0.001	0.00	n/a	0.005
Geron [2]	0.04	0.03	<0.001	n/a	0.001
InfoImage [3]	0.38	0.31	0.001	n/a	0.001
City of Menlo Park [4]	0.62	0.51	0.41	0.96	0.00
Latham & Watkins [3]	0.08	0.06	<0.001	n/a	0.004
BAAQMD Threshold - Individual Source	10	10	1.0	1.0	0.3
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**

Source: BAAQMD Stationary Source Screening Analysis Tool (2012), adjusted for school-based receptors.
Note: Acute Hazards Index information not provided by BAAQMD's screening tools for stationary sources. Acute Hazards were determined only for stationary sources which required additional evaluation (e.g. L-3 Communications Randtron and City of Menlo Park).
[1] BAAQMD's Beta Calculator 1.3 and Diesel IC Engine Distance Multiplier Tool (2012) were used to determine the screening level health risk values.
[2] Health Risk Screening Analysis (HRSA) information from BAAQMD was used to determine the screening level health risk values.
[3] BAAQMD's Diesel IC Engine Distance Multiplier Tool (2012) was used to adjust the screening level health risk values.
[4] BAAQMD's Beta Calculator 1.3 was used to determine the screening level health risk values.

6.3 CUMULATIVE SOURCES

The cumulative health risks from all evaluated emission sources are shown in Table 7. The calculations and cumulative screening health risk values that are used in this assessment are also provided in Table B3 of Appendix B. As shown in Table 7, the cumulative risk values adjusted for school-based receptors do not exceed BAAQMD's cumulative significance thresholds.

6. Adjusted Screening Health Risk Values

Table 7 Cumulative Screening Health Risk Values – School-Based Exposure Scenario

Source	Cancer Risk		Chronic Hazard Index	Acute Hazard Index	$PM_{2.5}$ (µg/m³)
	Staff Exposure (per million)	Student Exposure (per million)			
Highway 101 – Link 23	1.70	1.38	0.015	0.016	0.15
Highway 84/Bayfront Expressway – Link 22	0.16	0.13	0.001	0.004	0.02
L-3 Communications Randtron [1]	0.05	0.04	<0.001	0.002	0.001
ECI Painting, Inc.	<0.001	<0.001	0.00	n/a	0.005
Geron [2]	0.04	0.03	<0.001	n/a	0.001
InfoImage [3]	0.38	0.31	0.001	n/a	0.001
City of Menlo Park [4]	0.62	0.51	0.41	0.96	0.00
Latham & Watkins [3]	0.08	0.06	<0.001	n/a	0.004
BAAQMD Threshold – Individual Source	10	10	1.0	1.0	0.3
Exceeds Threshold	**No**	**No**	**No**	**No**	**No**
Total Health Risk Values – All Sources	3.03	2.47	0.42	0.98	0.17
BAAQMD Threshold - Cumulative	100	100	10.0	10.0	0.8
Exceeds Threshold	**No**	**No**	**No**	**No**	**No**

Sources: BAAQMD Highway Screening Analysis Tool for San Mateo County (2011), for first floor receptors (6-feet) and BAAQMD Stationary Source Screening Analysis Tool (2012); adjusted for school-based receptors.
[1] BAAQMD's Beta Calculator 1.3 and Diesel IC Engine Distance Multiplier Tool (2012) were used to determine the screening level health risk values.
[2] Health Risk Screening Analysis (HRSA) information from BAAQMD was used to determine the screening level health risk values.
[3] BAAQMD's Diesel IC Engine Distance Multiplier Tool (2012) was used to adjust the screening level health risk values.
[4] BAAQMD's Beta Calculator 1.3 was used to determine the screening level health risk values.

6. Adjusted Screening Health Risk Values

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7. Conclusions

The results of the health risk assessment from individual emission sources, provided in Table 7, indicate that the excess cancer risk from each individual stationary and mobile source within a quarter-mile from the site is less than the BAAQMD threshold of 10 in a million for a lifetime cancer risk and less than the non-carcinogenic chronic and acute hazard indexes of 1.0. The $PM_{2.5}$ concentrations for all individual emission sources are below the BAAQMD significance threshold of 0.3 $\mu g/m^3$. In addition, the cumulative health risks from all evaluated emission sources are below BAAQMD's cumulative significance thresholds.

Based on a comparison to the carcinogenic and non-carcinogenic thresholds established by OEHHA and BAAQMD, hazardous air emissions generated from the stationary and mobile sources within a quarter-mile radius are not anticipated to pose an actual or potential endangerment to students and staff occupying the Project site and no mitigation measures are required.

7. Conclusions

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8. References

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Appendix A. Screening Analysis

Table B: Stationary Sources

Table B Section 1: Requestor fills out these columns based on Google Earth data				Table B Section 2: BAAQMD returns form with additional information in these columns as needed									
Distance from Receptor (feet)	Plant # or Gas Dispensary #	Facility Name	Street Address	Screening Level Cancer Risk (1)	Screening Level Hazard Index (1)	Screening Level PM2.5 (1)	HRSA Cancer Risk in a million	Age Sensitivity Factor (8)	HRSA Adjusted Cancer Risk	HRSA Chronic Health (9)	HRSA PM2.5 Risk	Status/Comments
650	2877	L-3 Communications Randtron Antenna Syst	130 Constitution Drive	3001.64	1.062	5.310					0	see attached sheet note.
570	561	ECI Painting Inc	165 Constitution Drive	0.001	0.000	0.005					0	low risk/concentration, no further study needed.
850	16110	Geron	230 Constitution Drive	94.21	0.033	0.022	0.200	1.7	0.34	6.9 E-5	0.001065831	Use HRSA values
80	18216	InfoImage	141 Jefferson Drive	4.09	0.001	0.001					0	low risk/concentration, no further study needed.
1,000 ?	3499	City of Menlo Park	Marsh Road	286.00	0.534	1.02					0	consider site-specific modeling. Current emissions included on attached sheet
1,000 ?	11668	Gas Recovery Systems, Inc.	Marsh Road	11.30	0.005	17.1					0	No risk/concentration: Plant closed 11/30/13
1,100	17258	Latham & Watkins	140 Scott Drive	17.693406	0.006247	0.004					0	consider applying distance multiplier.
325	9573	Diageo North America, Inc	151 Commonwealth Drive	79.44	0.028099	0.157					0	No risk/concentration:Plant closed 8/31/11
											0	

Note: consider site-specific modeling
for this plant. Also, can use the current emissions
numbers to calculate the emissions for the
diesel generator and apply the distance
multiplier to this source.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT Printed: MAR 27, 2015
DETAIL POLLUTANTS - ABATED
MOST RECENT P/O APPROVED (2015)

L-3 Communications Randtron Antenna Systems (P# 2877)

S# SOURCE NAME
MATERIAL SOURCE CODE
THROUGHPUT DATE POLLUTANT CODE LBS/DAY
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200 Wipe Cleaning: Bldg 1&2 (130 Constitution & 125 Independence
SF03B157
Isopropyl alcohol 157 1.47E-01
SF03C201
Organic liquid - other/not 201 7.59E-02
211 B;eeler Brothers Paint Spray Booth
SG52A170
Methyl ethyl ketone (MEK) 169 3.39E-04
Methyl isobutyl ketone (MI 170 1.63E-02
Organic liquid - other/not 201 3.39E-04
SG52B169
Methyl ethyl ketone (MEK) 169 0.00E+00
Methyl isobutyl ketone (MI 170 0.00E+00
SG62C169
Methyl ethyl ketone (MEK) 169 9.20E-03
Methyl isobutyl ketone (MI 170 1.84E-03
Organic liquid - other/not 201 4.29E-03
SG700455
Acetone 455 4.52E-03
SG92A049
Butyl alcohol 49 0.00E+00
Toluene 293 0.00E+00
223 Local exhaust process hood
SJ00A575
** Unknown Pollutant ** 575 4.79E-03
SJ00B293
Toluene 293 1.19E-03
300 Wipe Cleaning: Bldg 3&4 (1150 Chrysler & 138 Jefferson Dr)
SF03A455
Acetone 455 1.43E+00

SF03B157
Isopropyl alcohol 157 1.82E-01
SF03C201
Organic liquid - other/not 201 0.00E+00
411 Paint Spray Booth - Bldg #4
SG52A169
Butyl acetate 48 5.37E-04
Methyl ethyl ketone (MEK) 169 3.42E-03
Organic liquid - other/not 201 9.46E-03
SG700201
Organic liquid - other/not 201 7.34E-01
421 Curing Oven - Bldg #4
S3002000
Butyl acetate 48 1.25E-03
Methyl ethyl ketone (MEK) 169 7.98E-03
Organic liquid - other/not 201 2.21E-02
431 Ultrasonic Cleaner - Bldg #4
SF03A105
Ethyl alcohol 105 9.03E-02
500 Wipe Cleaning: Bldg 5 (150 Constitution Dr)
SF03A455
Acetone 455 2.19E-01
SF03B169
Methyl ethyl ketone (MEK) 169 0.00E+00
SF03C201
Organic liquid - other/not 201 1.03E-01
511 Paint Spray Booth - Bldg #5
SG54A169
Ethers 103 1.71E-03
Methyl ethyl ketone (MEK) 169 6.85E-03
Organic liquid - other/not 201 9.51E-04
SG54B169
Isopropyl alcohol 157 0.00E+00
Methyl ethyl ketone (MEK) 169 0.00E+00
SG54C169
Methyl ethyl ketone (MEK) 169 0.00E+00
Toluene 293 0.00E+00
SG700455
Acetone 455 4.79E-03
SG94A049
Butyl alcohol 49 0.00E+00
Toluene 293 0.00E+00
521 Curing Oven - Bldg #5
S4002000
Butyl alcohol 49 0.00E+00
Ethers 103 2.00E-03
Isopropyl alcohol 157 0.00E+00

Methyl ethyl ketone (MEK) 169 7.99E-03
Organic liquid - other/not 201 1.11E-03
Toluene 293 0.00E+00

523 Curing Oven - Bldg #5
S4002000
Butyl alcohol 49 0.00E+00
Ethers 103 2.00E-03
Isopropyl alcohol 157 0.00E+00
Methyl ethyl ketone (MEK) 169 7.99E-03
Organic liquid - other/not 201 1.11E-03
Toluene 293 0.00E+00

611 Paint Spray Booth - Bldg #3
SG94A049
Butyl alcohol 49 4.07E-03
Organic liquid - other/not 201 2.19E-03

621 Curing Oven - Bldg #3
S3002000
Butyl alcohol 49 0.00E+00
Organic liquid - other/not 201 0.00E+00

622 Diesel Engine, Cummins model 6BT5.9 G-2, emergency standby
C22AG098
Benzene 41 8.94E-05
Formaldehyde 124 7.40E-06
Organics (other, including 990 4.32E-03
Arsenic (all) 1030 7.79E-08
Beryllium (all) pollutant 1040 4.57E-08
Cadmium 1070 1.95E-07
Chromium (hexavalent) 1095 4.03E-09
Lead (all) pollutant 1140 1.65E-07
Manganese 1160 2.59E-07
Nickel pollutant 1180 3.15E-06
Mercury (all) pollutant 1190 5.51E-08
Diesel Engine Exhaust Part 1350 4.50E-03
PAH's (non-speciated) 1840 4.11E-07
Nitrous Oxide (N2O) 2030 2.40E-05
Nitrogen Oxides (part not 2990 2.81E-02
Sulfur Dioxide (SO2) 3990 2.92E-05
Carbon Monoxide (CO) pollu 4990 1.37E-02
Carbon Dioxide, non-biogen 6960 3.00E+00
Methane (CH4) 6970 1.20E-04

PLANT TOTAL:
lbs/day Pollutant

4.79E-03 (575)
1.66E+00 Acetone (455)
7.79E-08 Arsenic (all) (1030)

8.94E-05 Benzene (41)
4.57E-08 Beryllium (all) pollutant (1040)
1.79E-03 Butyl acetate (48)
4.07E-03 Butyl alcohol (49)
1.95E-07 Cadmium (1070)
3.00E+00 Carbon Dioxide, non-biogenic CO2 (6960)
1.37E-02 Carbon Monoxide (CO) pollutant (4990)
4.03E-09 Chromium (hexavalent) (1095)
4.50E-03 Diesel Engine Exhaust Particulate Matter (1350)
5.71E-03 Ethers (103)
9.03E-02 Ethyl alcohol (105)
7.40E-06 Formaldehyde (124)
3.29E-01 Isopropyl alcohol (157)
1.65E-07 Lead (all) pollutant (1140)
2.59E-07 Manganese (1160)
5.51E-08 Mercury (all) pollutant (1190)
1.20E-04 Methane (CH4) (6970)
4.38E-02 Methyl ethyl ketone (MEK) (169)
1.81E-02 Methyl isobutyl ketone (MIBK) (170)
3.15E-06 Nickel pollutant (1180)
2.81E-02 Nitrogen Oxides (part not spec elsewhere) (2990)
2.40E-05 Nitrous Oxide (N2O) (2030)
9.54E-01 Organic liquid - other/not spec (201)
4.32E-03 Organics (other, including CH4) (990)
4.11E-07 PAH's (non-speciated) (1840)
2.92E-05 Sulfur Dioxide (SO2) (3990)
1.19E-03 Toluene (293)

Plant #: 2877
Plant Name: L-3 Communications Randtron Antenna Systems
Number of Sources: 622 Diesel Engine - emergency generator

Pollutant Name	Emissions/lbs per day	Cancer Risk (in millions)
ACETALDEHYDE		0.00E+00
ACETAMIDE		0.00E+00
ACRYLAMIDE		0.00E+00
ACRYLONITRILE		0.00E+00
ALLYL CHLORIDE		0.00E+00
2-AMINOANTHRAQUINONE		0.00E+00
ANILINE		0.00E+00
ARSENIC AND COMPOUNDS (INORGANIC)[1,2]	7.79E-08	3.93E-09
ASBESTOS [3]		0.00E+00
BENZENE[1]	8.94E-05	8.63E-09
BENZIDINE (AND ITS SALTS) values also apply to:		0.00E+00
Benzidine based dyes		0.00E+00
Direct Black 38		0.00E+00
Direct Blue 6		0.00E+00
Direct Brown 95 (technical grade)		0.00E+00
BENZYL CHLORIDE		0.00E+00
BERYLLIUM AND COMPOUNDS[2]	4.57E-08	3.55E-10
BIS(2-CHLOROETHYL)ETHER (Dichloroethyl ether)		0.00E+00
BIS(CHLOROMETHYL)ETHER		0.00E+00
POTASSIUM BROMATE		0.00E+00
1,3-BUTADIENE		0.00E+00
CADMIUM AND COMPOUNDS[2]	1.95E-07	2.70E-09
CARBON TETRACHLORIDE[1] (Tetrachloromethane)		0.00E+00
CHLORINATED PARAFFINS		0.00E+00
4-CHLORO-O-PHENYLENEDIAMINE		0.00E+00
CHLOROFORM[1]		0.00E+00
PENTACHLOROPHENOL		0.00E+00
2,4,6-TRICHLOROPHENOL		0.00E+00
p-CHLORO-o-TOLUIDINE		0.00E+00
CHROMIUM 6+2	4.03E-09	1.91E-09
Barium chromate2		0.00E+00
Calcium chromate2		0.00E+00
Lead chromate2		0.00E+00
Sodium dichromate2		0.00E+00
Strontium chromate2		0.00E+00
CHROMIC TRIOXIDE (as chromic acid mist)		0.00E+00
p-CRESIDINE		0.00E+00
CUPFERRON		0.00E+00
2,4-DIAMINOANISOLE		0.00E+00
2,4-DIAMINOTOLUENE		0.00E+00
1,2-DIBROMO-3-CHLOROPROPANE (DBCP)		0.00E+00
1,4-DICHLOROBENZENE		0.00E+00
3,3-DICHLOROBENZIDINE		0.00E+00
1,1,-DICHLOROETHANE (Ethylidene dichloride)		0.00E+00
DI(2-ETHYLHEXYL)PHTHALATE (DEHP)		0.00E+00
p-DIMETHYLAMINOAZOBENZENE		0.00E+00
2,4-DINITROTOLUENE		0.00E+00
1,4-DIOXANE (1,4-Diethylene dioxide)		0.00E+00
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)		0.00E+00
ETHYL BENZENE		0.00E+00
ETHYLENE DIBROMIDE (1,2-Dibromoethane)		0.00E+00
ETHYLENE DICHLORIDE (1,2-Dichloroethane)		0.00E+00
ETHYLENE OXIDE (1,2-Epoxyethane)		0.00E+00
ETHYLENE THIOUREA		0.00E+00
FORMALDEHYDE	7.40E-06	1.50E-10
HEXACHLOROBENZENE		0.00E+00
HEXACHLOROCYCLOHEXANES (mixed or technical grade)		0.00E+00
alpha-HEXACHLOROCYCLOHEXANE		0.00E+00
beta- HEXACHLOROCYCLOHEXANE		0.00E+00
gamma-HEXACHLOROCYCLOHEXANE (Lindane)		0.00E+00
HYDRAZINE		0.00E+00
LEAD AND COMPOUNDS 2,4 (inorganic) values also apply to:	1.65E-07	1.89E-11
Lead acetate2		0.00E+00
Lead phosphate2		0.00E+00
Lead subacetate2		0.00E+00
METHYL tertiary-BUTYL ETHER		0.00E+00
4,4'-METHYLENE BIS (2-CHLOROANILINE) (MOCA)		0.00E+00
METHYLENE CHLORIDE (Dichloromethane)		0.00E+00
4,4'-METHYLENE DIANILINE (AND ITS DICHLORIDE)		0.00E+00
MICHLER'S KETONE (4,4'-Bis(dimethylamino)benzophenone)		0.00E+00
N-NITROSODI-n-BUTYLAMINE		0.00E+00
N-NITROSODI-n-PROPYLAMINE		0.00E+00
N-NITROSODIETHYLAMINE		0.00E+00
N-NITROSODIMETHYLAMINE		0.00E+00
N-NITROSODIPHENYLAMINE		0.00E+00
N-NITROSO-N-METHYLETHYLAMINE		0.00E+00
N-NITROSOMORPHOLINE		0.00E+00
N-NITROSOPIPERIDINE		0.00E+00
N-NITROSOPYRROLIDINE		0.00E+00
NICKEL AND COMPOUNDS2 (values also apply to:)	3.15E-06	2.66E-09
Nickel acetate2		0.00E+00
Nickel carbonate2		0.00E+00
Nickel carbonyl2		0.00E+00
Nickel hydroxide2		0.00E+00
Nickelocene2		0.00E+00
NICKEL OXIDE2		0.00E+00
Nickel refinery dust from the pyrometallurgical process2		0.00E+00
Nickel subsulfide2		0.00E+00
p-NITROSODIPHENYLAMINE		0.00E+00
PARTICULATE EMISSIONS FROM DIESEL-FUELED ENGINES	4.50E-03	4.78E-06
PERCHLOROETHYLENE (Tetrachloroethylene)		0.00E+00
PCB (POLYCHLORINATED BIPHENYLS) [low risk] 2,6		0.00E+00
PCB (POLYCHLORINATED BIPHENYLS) [high risk] 2,6		0.00E+00
POLYCHLORINATED DIBENZO-P-DIOXINS (PCDD)(AS 2,3,7,8-PCDD EQUIV) 2,7		0.00E+00
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN2,7		0.00E+00
POLYCHLORINATED DIBENZOFURANS (PCDF)(AS 2,3,7,8-PCDD EQUIV) 2,7		0.00E+00
2,3,7,8-TETRACHLORODIBENZOFURAN2,7		0.00E+00
POLYCYCLIC AROMATIC HYDROCARBON2 (PAH) (AS B(a)P-EQUIV)5	4.11E-07	2.17E-08
BENZO(A)PYRENE2,5		0.00E+00
NAPHTHALENE		0.00E+00
1,3-PROPANE SULTONE		0.00E+00
PROPYLENE OXIDE		0.00E+00
1,1,2,2-TETRACHLOROETHANE		0.00E+00
THIOACETAMIDE		0.00E+00
Toluene diisocyantates		0.00E+00
TOLUENE-2,4-DIISOCYANATE		0.00E+00
TOLUENE-2,6-DIISOCYANATE		0.00E+00
1,1,2-TRICHLOROETHANE (Vinyl trichloride)		0.00E+00
TRICHLOROETHYLENE		0.00E+00
URETHANE (Ethyl carbamate)		0.00E+00
VINYL CHLORIDE (Chloroethylene)		0.00E+00
	TOTAL:	4.82E-06

Plant #: 2877
Plant Name: L-3 Communications Randtron Antenna Systems
Number of Sources: 622 Diesel Engine - emergency generator

Pollutant Name	Emission/lbs per day	Chronic Hazard
ACETALDEHYDE		0
ACROLEIN		0
ACRYLONITRILE		0
AMMONIA		0
ARSENIC AND COMPOUNDS (INORGANIC)1,2	7.79E-08	0.000370586
ARSINE		0
BENZENE1	8.94E-05	2.81279E-06
BERYLLIUM AND COMPOUNDS2	4.57E-08	1.23368E-05
1,3-BUTADIENE		0
CADMIUM AND COMPOUNDS2	1.95E-07	2.05777E-05
CARBON DISULFIDE1		0
CARBON TETRACHLORIDE1 (Tetrachloromethane)		0
CHLORINE		0
CHLORINE DIOXIDE		0
CHLOROBENZENE		0
CHLOROFORM1		0
2,3,4,6-Tetrachlorophenol		0
CHLOROPICRIN		0
CHROMIUM 6+2	4.03E-09	3.80387E-08
Barium chromate2		0
Calcium chromate2		0
Lead chromate2		0
Sodium dichromate2		0
Strontium chromate2		0
CHROMIC TRIOXIDE (as chromic acid mist)		0
CRESOLS		0
M-CRESOL		0
O-CRESOL		0
P-CRESOL		0
Cyanide And Compounds (inorganic)		0
HYDROGEN CYANIDE (Hydrocyanic acid)		0
1,4-DICHLOROBENZENE		0
DIETHANOLAMINE		0
DIMETHYLAMINE		0
N,N-DIMETHYL FORMAMIDE		0
1,4-DIOXANE (1,4-Diethylene dioxide)		0
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)		0
1,2-EPOXYBUTANE		0
ETHYL BENZENE		0
ETHYL CHLORIDE (Chloroethane)		0
ETHYLENE DIBROMIDE (1,2-Dibromoethane)		0
ETHYLENE DICHLORIDE (1,2-Dichloroethane)		0
ETHYLENE GLYCOL		0
ETHYLENE OXIDE (1,2-Epoxyethane)		0
Fluorides		0
HYDROGEN FLUORIDE (Hydrofluoric acid)		0
FORMALDEHYDE	7.40E-06	1.55217E-06
GASOLINE VAPORS		0
GLUTARALDEHYDE		0
ETHYLENE GLYCOL ETHYL ETHER – EGEE1		0
ETHYLENE GLYCOL ETHYL ETHER ACETATE – EGEEA1		0
ETHYLENE GLYCOL METHYL ETHER – EGME1		0
ETHYLENE GLYCOL METHYL ETHER ACETATE – EGMEA		0
n-HEXANE		0
HYDRAZINE		0
HYDROCHLORIC ACID (Hydrogen chloride)		0
HYDROGEN SULFIDE		0
ISOPHORONE		0
ISOPROPYL ALCOHOL (Isopropanol)		0
MALEIC ANHYDRIDE		0
MANGANESE AND COMPOUNDS	0.000000259	5.43261E-06
MERCURY AND COMPOUNDS (INORGANIC) values also apply to:	5.51E-08	1.46663E-05
Mercuric chloride		0
METHANOL		0
METHYL BROMIDE (Bromomethane)		0
METHYL tertiary-BUTYL ETHER		0
METHYL CHLOROFORM (1,1,1-Trichloroethane)		0
METHYL ISOCYANATE		0
METHYLENE CHLORIDE (Dichloromethane)		0
4,4'-METHYLENE DIANILINE (AND ITS DICHLORIDE)		0
METHYLENE DIPHENYL ISOCYANATE		0
NICKEL AND COMPOUNDS2 (values also apply to:)	3.15E-06	0.00011893
Nickel acetate2		0
Nickel carbonate2		0
Nickel carbonyl2		0
Nickel hydroxide2		0
Nickelocene2		0
NICKEL OXIDE2		0
Nickel refinery dust from the pyrometallurgical process2		0
Nickel subsulfide2		0
NITROGEN DIOXIDE	0.0281	0.000112865
PARTICULATE EMISSIONS FROM DIESEL-FUELED ENGINES	4.50E-03	0.001699001
PERCHLOROETHYLENE (Tetrachloroethylene)		0
PHENOL		0
PHOSPHINE		0
PHOSPHORIC ACID		0
PHOSPHORUS (WHITE)		0
PHTHALIC ANHYDRIDE		0
POLYCHLORINATED DIBENZO-P-DIOXINS (PCDD)(AS 2,3,7,8-PCDD EQUIV) 2,7		0
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN2,7		0
POLYCHLORINATED DIBENZOFURANS (PCDF)(AS 2,3,7,8-PCDD EQUIV) 2,7		0
2,3,7,8-TETRACHLORODIBENZOFURAN2,7		0
1,2,3,7,8-PENTACHLORODIBENZOFURAN2,7		0
2,3,4,7,8-PENTACHLORODIBENZOFURAN2,7		0
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN2,7		0
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN2,7		0
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN2,7		0
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN2,7		0
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN2,7		0
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN2,7		0
1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN2,7		0
NAPHTHALENE		0
PROPYLENE (PROPENE)		0
PROPYLENE GLYCOL MONOMETHYL ETHER		0
PROPYLENE OXIDE		0
SELENIUM AND COMPOUNDS		0
Selenium sulfide		0
SILICA (Crystalline, Respirable)		0
STYRENE		0
SULFUR DIOXIDE	0.0000292	8.35199E-08
SULFURIC ACID AND OLEUM		0
SULFURIC ACID		0
SULFUR TRIOXIDE		0
OLEUM		0
TOLUENE		0
Toluene diisocyantates		0
TOLUENE-2,4-DIISOCYANATE		0
TOLUENE-2,6-DIISOCYANATE		0
TRICHLOROETHYLENE		0
TRIETHYLAMINE		0
VINYL ACETATE		0
VINYLIDENE CHLORIDE (1,1-Dichloroethylene)		0
XYLENES (mixed isomers)		0
m-XYLENE		0
o-XYLENE		0
p-XYLENE		0
	TOTAL:	2.36E-03

Plant #: 2877
Plant Name: L-3 Communications Randtron Antenna Systems
Number of Sources: 622 Diesel Engine - emergency generator

Pollutant Name	Emission/lbs per day	Acute Hazard
ACETALDEHYDE	0	0
ACROLEIN		0
ACRYLIC ACID		0
AMMONIA		0
ARSENIC AND COMPOUNDS (INORGANIC)1,2	7.79E-08	7.3529E-06
ARSINE		0
BENZENE1	8.94E-05	1.29821E-06
BENZYL CHLORIDE		0
CARBON DISULFIDE1		0
CARBON MONOXIDE	0.0137	1.12446E-05
CARBON TETRACHLORIDE1 (Tetrachloromethane)		0
CHLORINE		0
CHLOROFORM1		0
CHLOROPICRIN		0
COPPER AND COMPOUNDS		0
Cyanide And Compounds (inorganic)		0
HYDROGEN CYANIDE (Hydrocyanic acid)		0
1,4-DIOXANE (1,4-Diethylene dioxide)		0
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)		0
Fluorides		0
HYDROGEN FLUORIDE (Hydrofluoric acid)		0
FORMALDEHYDE	7.40E-06	2.53992E-06
ETHYLENE GLYCOL BUTYL ETHER – EGBE		0
ETHYLENE GLYCOL ETHYL ETHER – EGEE1		0
ETHYLENE GLYCOL ETHYL ETHER ACETATE – EGEEA1		0
ETHYLENE GLYCOL METHYL ETHER – EGME1		0
HYDROCHLORIC ACID (Hydrogen chloride)		0
HYDROGEN SULFIDE		0
ISOPROPYL ALCOHOL (Isopropanol)		0
MERCURY AND COMPOUNDS (INORGANIC) values also apply to:	5.51E-08	1.73361E-06
Mercuric chloride		0
METHANOL		0
METHYL BROMIDE (Bromomethane)		0
METHYL CHLOROFORM (1,1,1-Trichloroethane)		0
METHYL ETHYL KETONE (2-Butanone)		0
METHYLENE CHLORIDE (Dichloromethane)		0
NICKEL AND COMPOUNDS2 (values also apply to:)	3.15E-06	9.91084E-06
Nickel acetate2		0
Nickel carbonate2		0
Nickel carbonyl2		0
Nickel hydroxide2		0
Nickelocene2		0
NICKEL OXIDE2		0
Nickel refinery dust from the pyrometallurgical process2		0
Nickel subsulfide2		0
NITRIC ACID		0
OZONE		0
PROPYLENE OXIDE		0
HYDROGEN SELENIDE		0
SODIUM HYDROXIDE		0
STYRENE		0
SULFATES		0
SULFUR DIOXIDE	0.0000292	8.35199E-07
SULFURIC ACID AND OLEUM		0
SULFURIC ACID		0
SULFUR TRIOXIDE		0
OLEUM		0
TOLUENE		0
TRIETHYLAMINE		0
Vanadium (fume or dust)		0
VANADIUM PENTOXIDE		0
VINYL CHLORIDE (Chloroethylene)		0
XYLENES (mixed isomers)		0
m-XYLENE		0
o-XYLENE		0
p-XYLENE		0
	TOTAL:	3.49E-05

Plant #: 2877
Plant Name: L-3 Communications Randtron Antenna Systems
Number of Sources: 622 Diesel Engine - emergency generator

Diesel PM Concentrations	Emissions (lbs/day)	M2.5 Concentration (ug/m3)
	4.50E-03	0.008688825
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0
		0
TOTAL:		0.008688825

L-3 Communications Randtron Antenna System
Diesel Engine Distance Adjustment

Distance meters	Distance feet	Distance adjustment multiplier	Enter Risk or Hazard	Adjusted Risk or Hazard	Enter PM2.5 Concentration	Adjusted PM2.5 Concentration
25	82	0.85		0		0
30	98	0.73		0		0
35	115	0.64		0		0
40	131	0.58		0		0
50	164	0.5		0		0
60	197	0.41		0		0
70	230	0.31		0		0
80	262	0.28		0		0
90	295	0.25		0		0
100	328	0.22		0		0
110	361	0.18		0		0
120	394	0.16		0		0
130	426	0.15		0		0
140	459	0.14		0		0
150	492	0.12		0		0
160	525	0.1		0		0
180	590	0.09	4.82E-06	4.3374E-07	0.008688825	0.000781994
200	656	0.08		0		0
220	722	0.07		0		0
240	787	0.06		0		0
260	853	0.05		0		0
280	918	0.04		0		0

Plant #: 2877
Plant Name: L-3 Communications Randtron Antenna Systems
Number of Sources: Wipe Cleaning, Spraybooths, Curing Ovens

Pollutant Name	Emissions/lbs per day	Cancer Risk (in millions)
ACETALDEHYDE		0.00E+00
ACETAMIDE		0.00E+00
ACRYLAMIDE		0.00E+00
ACRYLONITRILE		0.00E+00
ALLYL CHLORIDE		0.00E+00
2-AMINOANTHRAQUINONE		0.00E+00
ANILINE		0.00E+00
ARSENIC AND COMPOUNDS (INORGANIC)[1,2]		0.00E+00
ASBESTOS [3]		0.00E+00
BENZENE[1]		0.00E+00
BENZIDINE (AND ITS SALTS) values also apply to:		0.00E+00
Benzidine based dyes		0.00E+00
Direct Black 38		0.00E+00
Direct Blue 6		0.00E+00
Direct Brown 95 (technical grade)		0.00E+00
BENZYL CHLORIDE		0.00E+00
BERYLLIUM AND COMPOUNDS[2]		0.00E+00
BIS(2-CHLOROETHYL)ETHER (Dichloroethyl ether)		0.00E+00
BIS(CHLOROMETHYL)ETHER		0.00E+00
POTASSIUM BROMATE		0.00E+00
1,3-BUTADIENE		0.00E+00
CADMIUM AND COMPOUNDS[2]		0.00E+00
CARBON TETRACHLORIDE[1] (Tetrachloromethane)		0.00E+00
CHLORINATED PARAFFINS		0.00E+00
4-CHLORO-O-PHENYLENEDIAMINE		0.00E+00
CHLOROFORM[1]		0.00E+00
PENTACHLOROPHENOL		0.00E+00
2,4,6-TRICHLOROPHENOL		0.00E+00
p-CHLORO-o-TOLUIDINE		0.00E+00
CHROMIUM 6+2		0.00E+00
Barium chromate2		0.00E+00
Calcium chromate2		0.00E+00
Lead chromate2		0.00E+00
Sodium dichromate2		0.00E+00
Strontium chromate2		0.00E+00
CHROMIC TRIOXIDE (as chromic acid mist)		0.00E+00
p-CRESIDINE		0.00E+00
CUPFERRON		0.00E+00
2,4-DIAMINOANISOLE		0.00E+00
2,4-DIAMINOTOLUENE		0.00E+00
1,2-DIBROMO-3-CHLOROPROPANE (DBCP)		0.00E+00
1,4-DICHLOROBENZENE		0.00E+00
3,3-DICHLOROBENZIDINE		0.00E+00
1,1,-DICHLOROETHANE (Ethylidene dichloride)		0.00E+00
DI(2-ETHYLHEXYL)PHTHALATE (DEHP)		0.00E+00
p-DIMETHYLAMINOAZOBENZENE		0.00E+00
2,4-DINITROTOLUENE		0.00E+00
1,4-DIOXANE (1,4-Diethylene dioxide)		0.00E+00
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)		0.00E+00
ETHYL BENZENE		0.00E+00
ETHYLENE DIBROMIDE (1,2-Dibromoethane)		0.00E+00
ETHYLENE DICHLORIDE (1,2-Dichloroethane)		0.00E+00
ETHYLENE OXIDE (1,2-Epoxyethane)		0.00E+00
ETHYLENE THIOUREA		0.00E+00
FORMALDEHYDE		0.00E+00
HEXACHLOROBENZENE		0.00E+00
HEXACHLOROCYCLOHEXANES (mixed or technical grade)		0.00E+00
alpha-HEXACHLOROCYCLOHEXANE		0.00E+00
beta- HEXACHLOROCYCLOHEXANE		0.00E+00
gamma-HEXACHLOROCYCLOHEXANE (Lindane)		0.00E+00
HYDRAZINE		0.00E+00
LEAD AND COMPOUNDS 2,4 (inorganic) values also apply to:		0.00E+00
Lead acetate2		0.00E+00
Lead phosphate2		0.00E+00
Lead subacetate2		0.00E+00
METHYL tertiary-BUTYL ETHER		0.00E+00
4,4'-METHYLENE BIS (2-CHLOROANILINE) (MOCA)		0.00E+00
METHYLENE CHLORIDE (Dichloromethane)		0.00E+00
4,4'-METHYLENE DIANILINE (AND ITS DICHLORIDE)		0.00E+00
MICHLER'S KETONE (4,4'-Bis(dimethylamino)benzophenone)		0.00E+00
N-NITROSODI-n-BUTYLAMINE		0.00E+00
N-NITROSODI-n-PROPYLAMINE		0.00E+00
N-NITROSODIETHYLAMINE		0.00E+00
N-NITROSODIMETHYLAMINE		0.00E+00
N-NITROSODIPHENYLAMINE		0.00E+00
N-NITROSO-N-METHYLETHYLAMINE		0.00E+00
N-NITROSOMORPHOLINE		0.00E+00
N-NITROSOPIPERIDINE		0.00E+00
N-NITROSOPYRROLIDINE		0.00E+00
NICKEL AND COMPOUNDS2 (values also apply to:)		0.00E+00
Nickel acetate2		0.00E+00
Nickel carbonate2		0.00E+00
Nickel carbonyl2		0.00E+00
Nickel hydroxide2		0.00E+00
Nickelocene2		0.00E+00
NICKEL OXIDE2		0.00E+00
Nickel refinery dust from the pyrometallurgical process2		0.00E+00
Nickel subsulfide2		0.00E+00
p-NITROSODIPHENYLAMINE		0.00E+00
PARTICULATE EMISSIONS FROM DIESEL-FUELED ENGINES		0.00E+00
PERCHLOROETHYLENE (Tetrachloroethylene)		0.00E+00
PCB (POLYCHLORINATED BIPHENYLS) [low risk] 2,6		0.00E+00
PCB (POLYCHLORINATED BIPHENYLS) [high risk] 2,6		0.00E+00
POLYCHLORINATED DIBENZO-P-DIOXINS (PCDD)(AS 2,3,7,8-PCDD EQUIV) 2,7		0.00E+00
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN2,7		0.00E+00
POLYCHLORINATED DIBENZOFURANS (PCDF)(AS 2,3,7,8-PCDD EQUIV) 2,7		0.00E+00
2,3,7,8-TETRACHLORODIBENZOFURAN2,7		0.00E+00
POLYCYCLIC AROMATIC HYDROCARBON2 (PAH) (AS B(a)P-EQUIV)5		0.00E+00
BENZO(A)PYRENE2,5		0.00E+00
NAPHTHALENE		0.00E+00
1,3-PROPANE SULTONE		0.00E+00
PROPYLENE OXIDE		0.00E+00
1,1,2,2-TETRACHLOROETHANE		0.00E+00
THIOACETAMIDE		0.00E+00
Toluene diisocyantates		0.00E+00
TOLUENE-2,4-DIISOCYANATE		0.00E+00
TOLUENE-2,6-DIISOCYANATE		0.00E+00
1,1,2-TRICHLOROETHANE (Vinyl trichloride)		0.00E+00
TRICHLOROETHYLENE		0.00E+00
URETHANE (Ethyl carbamate)		0.00E+00
VINYL CHLORIDE (Chloroethylene)		0.00E+00
	TOTAL:	0.00E+00

Plant #: 2877
Plant Name: L-3 Communications Randtron Antenna Systems
Number of Sources: Wipe Cleaning, Spraybooths, Curing Ovens

Pollutant Name	Emission/lbs per day	Chronic Hazard
ACETALDEHYDE		0
ACROLEIN		0
ACRYLONITRILE		0
AMMONIA		0
ARSENIC AND COMPOUNDS (INORGANIC)1,2		0
ARSINE		0
BENZENE1		0
BERYLLIUM AND COMPOUNDS2		0
1,3-BUTADIENE		0
CADMIUM AND COMPOUNDS2		0
CARBON DISULFIDE1		0
CARBON TETRACHLORIDE1 (Tetrachloromethane)		0
CHLORINE		0
CHLORINE DIOXIDE		0
CHLOROBENZENE		0
CHLOROFORM1		0
2,3,4,6-Tetrachlorophenol		0
CHLOROPICRIN		0
CHROMIUM 6+2		0
Barium chromate2		0
Calcium chromate2		0
Lead chromate2		0
Sodium dichromate2		0
Strontium chromate2		0
CHROMIC TRIOXIDE (as chromic acid mist)		0
CRESOLS		0
M-CRESOL		0
O-CRESOL		0
P-CRESOL		0
Cyanide And Compounds (inorganic)		0
HYDROGEN CYANIDE (Hydrocyanic acid)		0
1,4-DICHLOROBENZENE		0
DIETHANOLAMINE		0
DIMETHYLAMINE		0
N,N-DIMETHYL FORMAMIDE		0
1,4-DIOXANE (1,4-Diethylene dioxide)		0
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)		0
1,2-EPOXYBUTANE		0
ETHYL BENZENE		0
ETHYL CHLORIDE (Chloroethane)		0
ETHYLENE DIBROMIDE (1,2-Dibromoethane)		0
ETHYLENE DICHLORIDE (1,2-Dichloroethane)		0
ETHYLENE GLYCOL		0
ETHYLENE OXIDE (1,2-Epoxyethane)		0
Fluorides		0
HYDROGEN FLUORIDE (Hydrofluoric acid)		0
FORMALDEHYDE		0
GASOLINE VAPORS		0
GLUTARALDEHYDE		0
ETHYLENE GLYCOL ETHYL ETHER – EGEE1		0
ETHYLENE GLYCOL ETHYL ETHER ACETATE – EGEEA1		0
ETHYLENE GLYCOL METHYL ETHER – EGME1		0
ETHYLENE GLYCOL METHYL ETHER ACETATE – EGMEA		0
n-HEXANE		0
HYDRAZINE		0
HYDROCHLORIC ACID (Hydrogen chloride)		0
HYDROGEN SULFIDE		0
ISOPHORONE		0
ISOPROPYL ALCOHOL (Isopropanol)	0.329	8.87256E-05
MALEIC ANHYDRIDE		0
MANGANESE AND COMPOUNDS		0
MERCURY AND COMPOUNDS (INORGANIC) values also apply to:		0
Mercuric chloride		0
METHANOL		0
METHYL BROMIDE (Bromomethane)		0
METHYL tertiary-BUTYL ETHER		0
METHYL CHLOROFORM (1,1,1-Trichloroethane)		0
METHYL ISOCYANATE		0
METHYLENE CHLORIDE (Dichloromethane)		0
4,4'-METHYLENE DIANILINE (AND ITS DICHLORIDE)		0
METHYLENE DIPHENYL ISOCYANATE		0
NICKEL AND COMPOUNDS2 (values also apply to:)		0
Nickel acetate2		0
Nickel carbonate2		0
Nickel carbonyl2		0
Nickel hydroxide2		0
Nickelocene2		0
NICKEL OXIDE2		0
Nickel refinery dust from the pyrometallurgical process2		0
Nickel subsulfide2		0
NITROGEN DIOXIDE		0
PARTICULATE EMISSIONS FROM DIESEL-FUELED ENGINES		0
PERCHLOROETHYLENE (Tetrachloroethylene)		0
PHENOL		0
PHOSPHINE		0
PHOSPHORIC ACID		0
PHOSPHORUS (WHITE)		0
PHTHALIC ANHYDRIDE		0
POLYCHLORINATED DIBENZO-P-DIOXINS (PCDD)(AS 2,3,7,8-PCDD EQUIV) 2,7		0
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN2,7		0
POLYCHLORINATED DIBENZOFURANS (PCDF)(AS 2,3,7,8-PCDD EQUIV) 2,7		0
2,3,7,8-TETRACHLORODIBENZOFURAN2,7		0
1,2,3,7,8-PENTACHLORODIBENZOFURAN2,7		0
2,3,4,7,8-PENTACHLORODIBENZOFURAN2,7		0
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN2,7		0
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN2,7		0
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN2,7		0
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN2,7		0
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN2,7		0
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN2,7		0
1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN2,7		0
NAPHTHALENE		0
PROPYLENE (PROPENE)		0
PROPYLENE GLYCOL MONOMETHYL ETHER		0
PROPYLENE OXIDE		0
SELENIUM AND COMPOUNDS		0
Selenium sulfide		0
SILICA (Crystalline, Respirable)		0
STYRENE		0
SULFUR DIOXIDE		0
SULFURIC ACID AND OLEUM		0
SULFURIC ACID		0
SULFUR TRIOXIDE		0
OLEUM		0
TOLUENE	0.00119	7.48819E-06
Toluene diisocyantates		0
TOLUENE-2,4-DIISOCYANATE		0
TOLUENE-2,6-DIISOCYANATE		0
TRICHLOROETHYLENE		0
TRIETHYLAMINE		0
VINYL ACETATE		0
VINYLIDENE CHLORIDE (1,1-Dichloroethylene)		0
XYLENES (mixed isomers)		0
m-XYLENE		0
o-XYLENE		0
p-XYLENE		0
	TOTAL:	9.62E-05

Plant #: 2877
Plant Name: L-3 Communications Randtron Antenna Systems
Number of Sources: Wipe Cleaning, Spraybooths, Curing Ovens

Pollutant Name	Emission/lbs per day	Acute Hazard
ACETALDEHYDE	0	0
ACROLEIN		0
ACRYLIC ACID		0
AMMONIA		0
ARSENIC AND COMPOUNDS (INORGANIC)1,2		0
ARSINE		0
BENZENE1		0
BENZYL CHLORIDE		0
CARBON DISULFIDE1		0
CARBON MONOXIDE		0
CARBON TETRACHLORIDE1 (Tetrachloromethane)		0
CHLORINE		0
CHLOROFORM1		0
CHLOROPICRIN		0
COPPER AND COMPOUNDS		0
Cyanide And Compounds (inorganic)		0
HYDROGEN CYANIDE (Hydrocyanic acid)		0
1,4-DIOXANE (1,4-Diethylene dioxide)		0
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)		0
Fluorides		0
HYDROGEN FLUORIDE (Hydrofluoric acid)		0
FORMALDEHYDE		0
ETHYLENE GLYCOL BUTYL ETHER – EGBE		0
ETHYLENE GLYCOL ETHYL ETHER – EGEE1		0
ETHYLENE GLYCOL ETHYL ETHER ACETATE – EGEEA1		0
ETHYLENE GLYCOL METHYL ETHER – EGME1		0
HYDROCHLORIC ACID (Hydrogen chloride)		0
HYDROGEN SULFIDE		0
ISOPROPYL ALCOHOL (Isopropanol)	0.329	0.001940872
MERCURY AND COMPOUNDS (INORGANIC) values also apply to:		0
Mercuric chloride		0
METHANOL		0
METHYL BROMIDE (Bromomethane)		0
METHYL CHLOROFORM (1,1,1-Trichloroethane)		0
METHYL ETHYL KETONE (2-Butanone)	0.0438	6.36036E-05
METHYLENE CHLORIDE (Dichloromethane)		0
NICKEL AND COMPOUNDS2 (values also apply to:)		0
Nickel acetate2		0
Nickel carbonate2		0
Nickel carbonyl2		0
Nickel hydroxide2		0
Nickelocene2		0
NICKEL OXIDE2		0
Nickel refinery dust from the pyrometallurgical process2		0
Nickel subsulfide2		0
NITRIC ACID		0
OZONE		0
PROPYLENE OXIDE		0
HYDROGEN SELENIDE		0
SODIUM HYDROXIDE		0
STYRENE		0
SULFATES		0
SULFUR DIOXIDE		0
SULFURIC ACID AND OLEUM		0
SULFURIC ACID		0
SULFUR TRIOXIDE		0
OLEUM		0
TOLUENE	0.00119	6.0715E-07
TRIETHYLAMINE		0
Vanadium (fume or dust)		0
VANADIUM PENTOXIDE		0
VINYL CHLORIDE (Chloroethylene)		0
XYLENES (mixed isomers)		0
m-XYLENE		0
o-XYLENE		0
p-XYLENE		0
	TOTAL:	2.01E-03

BAY AREA AIR QUALITY MANAGEMENT DISTRICT Printed: MAR 27, 2015
DETAIL POLLUTANTS - ABATED
MOST RECENT P/O APPROVED (2014)

City of Menlo Park (P# 3499)

S# SOURCE NAME
MATERIAL SOURCE CODE
THROUGHPUT DATE POLLUTANT CODE LBS/DAY

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1 Bayfront Park Landfill with Gas Collection System

G7145511

POLLUTANT	CODE	LBS/DAY
Organics (other, including	990	0.00E+00
Nitrous Oxide (N2O)	2030	3.86E+01
Carbon Dioxide, non-biogen	6960	0.00E+00
Carbon Dioxide, biogenic C	6961	1.96E+06
Methane (CH4)	6970	7.77E+03

G7145580

POLLUTANT	CODE	LBS/DAY
Benzene	41	5.28E-03
Carbon tetrachloride	60	2.18E-05
Ethylene dichloride	107	1.44E-03
Hexane	148	2.00E-02
Methyl ethyl ketone (MEK)	169	1.81E-02
Perchloroethylene	210	2.19E-02
Toluene	293	1.28E-01
Trichloroethylene	295	1.31E-02
Xylene	307	4.55E-02
Ethylbenzene	333	1.73E-02
Dichlorodifluoromethane	355	6.72E-02
Vinylidene chloride	360	6.86E-04
Chloroform	390	1.27E-04
Methylene chloride	396	4.30E-02
Ethyl chloride	449	2.85E-03
Vinyl chloride	518	1.63E-02
1,1,1-Trichloroethane	565	2.27E-03
Trichlorofluoromethane	631	3.70E-03
Organics (other, excluding	989	1.52E+00
Hydrogen Sulfide (H2S)	5020	2.14E+00

Plant #: 3499
Plant Name: City of Menlo Park
Number of Sources: Landfill with Gas Collection System

Pollutant Name	Emissions/lbs per day	Cancer Risk (in millions)
ACETALDEHYDE		0.00E+00
ACETAMIDE		0.00E+00
ACRYLAMIDE		0.00E+00
ACRYLONITRILE		0.00E+00
ALLYL CHLORIDE		0.00E+00
2-AMINOANTHRAQUINONE		0.00E+00
ANILINE		0.00E+00
ARSENIC AND COMPOUNDS (INORGANIC)[1,2]		0.00E+00
ASBESTOS [3]		0.00E+00
BENZENE[1]	5.28E-03	5.10E-07
BENZIDINE (AND ITS SALTS) values also apply to:		0.00E+00
Benzidine based dyes		0.00E+00
Direct Black 38		0.00E+00
Direct Blue 6		0.00E+00
Direct Brown 95 (technical grade)		0.00E+00
BENZYL CHLORIDE		0.00E+00
BERYLLIUM AND COMPOUNDS[2]		0.00E+00
BIS(2-CHLOROETHYL)ETHER (Dichloroethyl ether)		0.00E+00
BIS(CHLOROMETHYL)ETHER		0.00E+00
POTASSIUM BROMATE		0.00E+00
1,3-BUTADIENE		0.00E+00
CADMIUM AND COMPOUNDS[2]		0.00E+00
CARBON TETRACHLORIDE[1] (Tetrachloromethane)	0.0000218	3.16E-09
CHLORINATED PARAFFINS		0.00E+00
4-CHLORO-O-PHENYLENEDIAMINE		0.00E+00
CHLOROFORM[1]	0.000127	2.33E-09
PENTACHLOROPHENOL		0.00E+00
2,4,6-TRICHLOROPHENOL		0.00E+00
p-CHLORO-o-TOLUIDINE		0.00E+00
CHROMIUM 6+2		0.00E+00
Barium chromate2		0.00E+00
Calcium chromate2		0.00E+00
Lead chromate2		0.00E+00
Sodium dichromate2		0.00E+00
Strontium chromate2		0.00E+00
CHROMIC TRIOXIDE (as chromic acid mist)		0.00E+00
p-CRESIDINE		0.00E+00
CUPFERRON		0.00E+00
2,4-DIAMINOANISOLE		0.00E+00
2,4-DIAMINOTOLUENE		0.00E+00
1,2-DIBROMO-3-CHLOROPROPANE (DBCP)		0.00E+00
1,4-DICHLOROBENZENE		0.00E+00
3,3-DICHLOROBENZIDINE		0.00E+00
1,1,-DICHLOROETHANE (Ethylidene dichloride)		0.00E+00
DI(2-ETHYLHEXYL)PHTHALATE (DEHP)		0.00E+00
p-DIMETHYLAMINOAZOBENZENE		0.00E+00
2,4-DINITROTOLUENE		0.00E+00
1,4-DIOXANE (1,4-Diethylene dioxide)		0.00E+00
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)		0.00E+00
ETHYL BENZENE	0.0173	1.45E-07
ETHYLENE DIBROMIDE (1,2-Dibromoethane)		0.00E+00
ETHYLENE DICHLORIDE (1,2-Dichloroethane)	0.00144	1.00E-07
ETHYLENE OXIDE (1,2-Epoxyethane)		0.00E+00
ETHYLENE THIOUREA		0.00E+00
FORMALDEHYDE		0.00E+00
HEXACHLOROBENZENE		0.00E+00
HEXACHLOROCYCLOHEXANES (mixed or technical grade)		0.00E+00
alpha-HEXACHLOROCYCLOHEXANE		0.00E+00
beta- HEXACHLOROCYCLOHEXANE		0.00E+00
gamma-HEXACHLOROCYCLOHEXANE (Lindane)		0.00E+00
HYDRAZINE		0.00E+00
LEAD AND COMPOUNDS 2,4 (inorganic) values also apply to:		0.00E+00
Lead acetate2		0.00E+00
Lead phosphate2		0.00E+00
Lead subacetate2		0.00E+00
METHYL tertiary-BUTYL ETHER		0.00E+00
4,4'-METHYLENE BIS (2-CHLOROANILINE) (MOCA)		0.00E+00
METHYLENE CHLORIDE (Dichloromethane)	0.043	1.45E-07
4,4'-METHYLENE DIANILINE (AND ITS DICHLORIDE)		0.00E+00
MICHLER'S KETONE (4,4'-Bis(dimethylamino)benzophenone)		0.00E+00
N-NITROSODI-n-BUTYLAMINE		0.00E+00
N-NITROSODI-n-PROPYLAMINE		0.00E+00
N-NITROSODIETHYLAMINE		0.00E+00
N-NITROSODIMETHYLAMINE		0.00E+00
N-NITROSODIPHENYLAMINE		0.00E+00
N-NITROSO-N-METHYLETHYLAMINE		0.00E+00
N-NITROSOMORPHOLINE		0.00E+00
N-NITROSOPIPERIDINE		0.00E+00
N-NITROSOPYRROLIDINE		0.00E+00
NICKEL AND COMPOUNDS2 (values also apply to:)		0.00E+00
Nickel acetate2		0.00E+00
Nickel carbonate2		0.00E+00
Nickel carbonyl2		0.00E+00
Nickel hydroxide2		0.00E+00
Nickelocene2		0.00E+00
NICKEL OXIDE2		0.00E+00
Nickel refinery dust from the pyrometallurgical process2		0.00E+00
Nickel subsulfide2		0.00E+00
p-NITROSODIPHENYLAMINE		0.00E+00
PARTICULATE EMISSIONS FROM DIESEL-FUELED ENGINES		0.00E+00
PERCHLOROETHYLENE (Tetrachloroethylene)	0.0219	4.44E-07
PCB (POLYCHLORINATED BIPHENYLS) [low risk] 2,6		0.00E+00
PCB (POLYCHLORINATED BIPHENYLS) [high risk] 2,6		0.00E+00
POLYCHLORINATED DIBENZO-P-DIOXINS (PCDD)(AS 2,3,7,8-PCDD EQUIV) 2,7		0.00E+00
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN2,7		0.00E+00
POLYCHLORINATED DIBENZOFURANS (PCDF)(AS 2,3,7,8-PCDD EQUIV) 2,7		0.00E+00
2,3,7,8-TETRACHLORODIBENZOFURAN2,7		0.00E+00
POLYCYCLIC AROMATIC HYDROCARBON2 (PAH) (AS B(a)P-EQUIV)5		0.00E+00
BENZO(A)PYRENE2,5		0.00E+00
NAPHTHALENE		0.00E+00
1,3-PROPANE SULTONE		0.00E+00
PROPYLENE OXIDE		0.00E+00
1,1,2,2-TETRACHLOROETHANE		0.00E+00
THIOACETAMIDE		0.00E+00
Toluene diisocyantates		0.00E+00
TOLUENE-2,4-DIISOCYANATE		0.00E+00
TOLUENE-2,6-DIISOCYANATE		0.00E+00
1,1,2-TRICHLOROETHANE (Vinyl trichloride)		0.00E+00
TRICHLOROETHYLENE	0.0131	8.85E-08
URETHANE (Ethyl carbamate)		0.00E+00
VINYL CHLORIDE (Chloroethylene)	0.0163	4.25E-06
	TOTAL:	5.69E-06

Plant #: 3499
Plant Name: City of Menlo Park
Number of Sources: Landfill with Gas Collection System

Pollutant Name	Emission/lbs per day	Chronic Hazard
ACETALDEHYDE		0
ACROLEIN		0
ACRYLONITRILE		0
AMMONIA		0
ARSENIC AND COMPOUNDS (INORGANIC)1,2		0
ARSINE		0
BENZENE1	5.28E-03	0.000166124
BERYLLIUM AND COMPOUNDS2		0
1,3-BUTADIENE		0
CADMIUM AND COMPOUNDS2		0
CARBON DISULFIDE1		0
CARBON TETRACHLORIDE1 (Tetrachloromethane)	0.0000218	1.02884E-06
CHLORINE		0
CHLORINE DIOXIDE		0
CHLOROBENZENE		0
CHLOROFORM1	0.000127	7.9916E-07
2,3,4,6-Tetrachlorophenol		0
CHLOROPICRIN		0
CHROMIUM 6+2		0
Barium chromate2		0
Calcium chromate2		0
Lead chromate2		0
Sodium dichromate2		0
Strontium chromate2		0
CHROMIC TRIOXIDE (as chromic acid mist)		0
CRESOLS		0
M-CRESOL		0
O-CRESOL		0
P-CRESOL		0
Cyanide And Compounds (inorganic)		0
HYDROGEN CYANIDE (Hydrocyanic acid)		0
1,4-DICHLOROBENZENE		0
DIETHANOLAMINE		0
DIMETHYLAMINE		0
N,N-DIMETHYL FORMAMIDE		0
1,4-DIOXANE (1,4-Diethylene dioxide)		0
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)		0
1,2-EPOXYBUTANE		0
ETHYL BENZENE	0.0173	1.63293E-05
ETHYL CHLORIDE (Chloroethane)	0.00285	1.79339E-07
ETHYLENE DIBROMIDE (1,2-Dibromoethane)		0
ETHYLENE DICHLORIDE (1,2-Dichloroethane)	0.00144	6.796E-06
ETHYLENE GLYCOL		0
ETHYLENE OXIDE (1,2-Epoxyethane)		0
Fluorides		0
HYDROGEN FLUORIDE (Hydrofluoric acid)		0
FORMALDEHYDE		0
GASOLINE VAPORS		0
GLUTARALDEHYDE		0
ETHYLENE GLYCOL ETHYL ETHER – EGEE1		0
ETHYLENE GLYCOL ETHYL ETHER ACETATE – EGEEA1		0
ETHYLENE GLYCOL METHYL ETHER – EGME1		0
ETHYLENE GLYCOL METHYL ETHER ACETATE – EGMEA		0
n-HEXANE	0.02	5.39365E-06
HYDRAZINE		0
HYDROCHLORIC ACID (Hydrogen chloride)		0
HYDROGEN SULFIDE	2.14	0.403984574
ISOPHORONE		0
ISOPROPYL ALCOHOL (Isopropanol)		0
MALEIC ANHYDRIDE		0
MANGANESE AND COMPOUNDS		0
MERCURY AND COMPOUNDS (INORGANIC) values also apply to:		0
Mercuric chloride		0
METHANOL		0
METHYL BROMIDE (Bromomethane)		0
METHYL tertiary-BUTYL ETHER		0
METHYL CHLOROFORM (1,1,1-Trichloroethane)	0.00227	4.28526E-06
METHYL ISOCYANATE		0
METHYLENE CHLORIDE (Dichloromethane)	0.043	0.000202936
4,4'-METHYLENE DIANILINE (AND ITS DICHLORIDE)		0
METHYLENE DIPHENYL ISOCYANATE		0
NICKEL AND COMPOUNDS2 (values also apply to:)		0
Nickel acetate2		0
Nickel carbonate2		0
Nickel carbonyl2		0
Nickel hydroxide2		0
Nickelocene2		0
NICKEL OXIDE2		0
Nickel refinery dust from the pyrometallurgical process2		0
Nickel subsulfide2		0
NITROGEN DIOXIDE		0
PARTICULATE EMISSIONS FROM DIESEL-FUELED ENGINES		0
PERCHLOROETHYLENE (Tetrachloroethylene)	0.0219	0.00118121
PHENOL		0
PHOSPHINE		0
PHOSPHORIC ACID		0
PHOSPHORUS (WHITE)		0
PHTHALIC ANHYDRIDE		0
POLYCHLORINATED DIBENZO-P-DIOXINS (PCDD)(AS 2,3,7,8-PCDD EQUIV) 2,7		0
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN2,7		0
1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN2,7		0
POLYCHLORINATED DIBENZOFURANS (PCDF)(AS 2,3,7,8-PCDD EQUIV) 2,7		0
2,3,7,8-TETRACHLORODIBENZOFURAN2,7		0
1,2,3,7,8-PENTACHLORODIBENZOFURAN2,7		0
2,3,4,7,8-PENTACHLORODIBENZOFURAN2,7		0
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN2,7		0
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN2,7		0
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN2,7		0
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN2,7		0
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN2,7		0
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN2,7		0
1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN2,7		0
NAPHTHALENE		0
PROPYLENE (PROPENE)		0
PROPYLENE GLYCOL MONOMETHYL ETHER		0
PROPYLENE OXIDE		0
SELENIUM AND COMPOUNDS		0
Selenium sulfide		0
SILICA (Crystalline, Respirable)		0
STYRENE		0
SULFUR DIOXIDE		0
SULFURIC ACID AND OLEUM		0
SULFURIC ACID		0
SULFUR TRIOXIDE		0
OLEUM		0
TOLUENE	0.128	0.000805452
Toluene diisocyantates		0
TOLUENE-2,4-DIISOCYANATE		0
TOLUENE-2,6-DIISOCYANATE		0
TRICHLOROETHYLENE	0.0131	4.12165E-05
TRIETHYLAMINE		0
VINYL ACETATE		0
VINYLIDENE CHLORIDE (1,1-Dichloroethylene)	0.000686	1.85002E-05
XYLENES (mixed isomers)	0.0455	0.000122706
m-XYLENE		0
o-XYLENE		0
p-XYLENE		0
	TOTAL:	4.07E-01

Plant #: 3499
Plant Name: City of Menlo Park
Number of Sources: Landfill with Gas Collection System

Pollutant Name	Emission/lbs per day	Acute Hazard
ACETALDEHYDE	0	0
ACROLEIN		0
ACRYLIC ACID		0
AMMONIA		0
ARSENIC AND COMPOUNDS (INORGANIC)1,2		0
ARSINE		0
BENZENE1	5.28E-03	7.66728E-05
BENZYL CHLORIDE		0
CARBON DISULFIDE1		0
CARBON MONOXIDE		0
CARBON TETRACHLORIDE1 (Tetrachloromethane)	0.0000218	2.16598E-07
CHLORINE		0
CHLOROFORM1	0.000127	1.59832E-05
CHLOROPICRIN		0
COPPER AND COMPOUNDS		0
Cyanide And Compounds (inorganic)		0
HYDROGEN CYANIDE (Hydrocyanic acid)		0
1,4-DIOXANE (1,4-Diethylene dioxide)		0
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)		0
Fluorides		0
HYDROGEN FLUORIDE (Hydrofluoric acid)		0
FORMALDEHYDE		0
ETHYLENE GLYCOL BUTYL ETHER – EGBE		0
ETHYLENE GLYCOL ETHYL ETHER – EGEE1		0
ETHYLENE GLYCOL ETHYL ETHER ACETATE – EGEEA1		0
ETHYLENE GLYCOL METHYL ETHER – EGME1		0
HYDROCHLORIC ACID (Hydrogen chloride)		0
HYDROGEN SULFIDE	2.14	0.961868034
ISOPROPYL ALCOHOL (Isopropanol)		0
MERCURY AND COMPOUNDS (INORGANIC) values also apply to:		0
Mercuric chloride		0
METHANOL		0
METHYL BROMIDE (Bromomethane)		0
METHYL CHLOROFORM (1,1,1-Trichloroethane)	0.00227	6.30185E-07
METHYL ETHYL KETONE (2-Butanone)	0.0181	2.62837E-05
METHYLENE CHLORIDE (Dichloromethane)	0.043	5.79818E-05
NICKEL AND COMPOUNDS2 (values also apply to:)		0
Nickel acetate2		0
Nickel carbonate2		0
Nickel carbonyl2		0
Nickel hydroxide2		0
Nickelocene2		0
NICKEL OXIDE2		0
Nickel refinery dust from the pyrometallurgical process2		0
Nickel subsulfide2		0
NITRIC ACID		0
OZONE		0
PROPYLENE OXIDE		0
HYDROGEN SELENIDE		0
SODIUM HYDROXIDE		0
STYRENE		0
SULFATES		0
SULFUR DIOXIDE		0
SULFURIC ACID AND OLEUM		0
SULFURIC ACID		0
SULFUR TRIOXIDE		0
OLEUM		0
TOLUENE	0.128	6.53069E-05
TRIETHYLAMINE		0
Vanadium (fume or dust)		0
VANADIUM PENTOXIDE		0
VINYL CHLORIDE (Chloroethylene)	0.0163	1.70949E-06
XYLENES (mixed isomers)	0.0455	3.90427E-05
m-XYLENE		0
o-XYLENE		0
p-XYLENE		0
	TOTAL:	9.62E-01

Appendix B. Risk Calculation Worksheets

Appendix

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Table B1 - Highway Screening

Highway - Screening Evaluation

70-Year Residential Exposure Scenario

Source No.	Source	Roadway Orientation	Annual Average Daily Trips	Distance	Cancer Risk (per million)	Chronic HI	Acute HI	PM2.5 (µg/m^3)	Comments
1	Highway 101	East-West	211,000	500 ft	**15.5**	0.015	0.016	0.15	Highway Screening Analysis Tool
2	Highway 84	East-West	48,000	900 ft	1.46	0.001	0.004	0.02	Highway Screening Analysis Tool
BAAQMD Significance Threshold					10.0	1.0	1.0	0.30	For each individual source
Exceeds Threshold?					**Yes**	**No**	**No**	**No**	Highway 101 (link 23) exceeds threshold

Note: To adjust the screening cancer risk values from 70-year residential values to school-based values, the Dose and concentration of TACs, assuming 100% DPM, was back-calculated using the screening cancer risks values. Once the concentration of DPM was determined, the staff and student screening cancer risks were

Screening Factors	Resident 70-Year	School Based Factors[1] Staff	Students	
Breathing Rate/Body Weight	302	230	520	L/kg-day
Age Sensitivity Factor	1.7	1	3	
Exposure Duration	70	25	4	years
Exposure Frequency	350	240	180	days/year

Assuming 100% DPM (CPF 1.1 [mg/kg-day]$^{-1}$)

		70-Yr Residential		Staff		Students	
Source No.	Source	$Dose_{air}$ (mg/kg-day)	C_{air} (µg/m^3)	C_{air} (µg/m^3)	$Dose_{air}$ (mg/kg-day)	C_{air} (µg/m^3)	$Dose_{air}$ (mg/kg-day)
1	Highway 101	8.29E-06	0.0286	0.0286	4.33E-06	0.0286	7.34E-06
2	Highway 84	7.83E-07	0.0027	0.0027	4.09E-07	0.0027	6.93E-07

Staff Exposure Scenario - Screening Level Risk Values [2]

Source No.	Source	Roadway Orientation	Annual Average Daily Trips	Age Sensitivity Factor	Cancer Risk (per million)	Chronic HI	Acute HI	PM2.5 (µg/m^3)	Comments
1	Highway 101	East-West	211,000	1.0	1.70	0.015	0.016	0.15	Highway Screening Analysis Tool
2	Highway 84	East-West	48,000	1.0	0.16	0.001	0.004	0.02	Highway Screening Analysis Tool
BAAQMD Significance Threshold					10.0	1.0	1.0	0.30	For each individual source
Exceeds Threshold?					**No**	**No**	**No**	**No**	

Student Exposure Scenario - Screening Level Risk Values [3]

Source No.	Source	Roadway Orientation	Annual Average Daily Trips	Age Sensitivity Factor	Cancer Risk (per million)	Chronic HI	Acute HI	PM2.5 (µg/m^3)	Comments
1	Highway 101	East-West	211,000	3.0	1.38	0.015	0.016	0.15	Highway Screening Analysis Tool
2	Highway 84	East-West	48,000	3.0	0.13	0.001	0.004	0.02	Highway Screening Analysis Tool
BAAQMD Significance Threshold					10.0	1.0	1.0	0.30	For each individual source
Exceeds Threshold?					**No**	**No**	**No**	**No**	

Sources: BAAQMD Highway Screening Analysis Tool - San Mateo County 6-ft elevation (2011).

[1] New OEHHA Guidelines (2015) using 95th percentile 8-hour breathing rates (moderate intensity activity) are used to estimate the school-based screening risk values.
[2] BAAQMD Screening Level Cancer Risk Values are for 70-year residential exposures. Therefore, the cancer risk values were adjusted for a shorter 25-year exposure scenario for staff.
[3] The cancer risk values were adjusted for a shorter 4-year exposure scenario for high school students of the proposed school site.

Table B2 - Stationary Source Screening
BAAQMD Permitted Sources

Stationary Source - Screening Evaluation

Screening Level Risk Values - 70-Year Residential Exposure Scenario

Source No.	Source	Facility ID	Distance Multiplier	Cancer Risk (per million)	Chronic HI	Acute HI	PM2.5 ($\mu g/m^3$)	Methodology
3	L-3 Communications Randtı	2877		**3002**	**1.062**	n/a	**5.310**	BAAQMD Screening Level values
4	ECI Painting, Inc.	561		0.001	0.000	n/a	0.005	BAAQMD Screening Level values
5	Geron	16110		0.34	0.000	n/a	0.001	BAAQMD HRSA values
6	InfoImage	18216		4.09	0.001	n/a	0.001	BAAQMD Screening Level values
	distance from Site - 80 ft		0.85	3.48	0.001		0.001	Diesel engine distance multiplier
7	City of Menlo Park	3499		**286**	0.534	n/a	**1.02**	BAAQMD Screening Level values
8	Latham & Watkins	17258		17.7	0.006	n/a	0.004	BAAQMD Screening Level values
	distance from Site - 1,100 ft		0.04	0.71	0.000		0.004	Diesel engine distance multiplier
	BAAQMD Significance Threshold			10.0	1.0	1.0	0.30	For each individual source
	Exceeds Threhold?			**Yes**	**Yes**	n/a	**Yes**	Sources 3 and 7 exceed threshold

Note: To adjust the screening cancer risk values from 70-year residential values to school-based values, the Dose and concentration of TACs, assuming 100% DPM, was back-calculated using the screening cancer risks values. Once the concentration of DPM was determined, the staff and student screening cancer risks were determined using the following school-based screening factors:

Screening Factors	Resident 70-Year	School Based Factors[1] Staff	Students	
Breathing Rate/Body Weight	302	230	520	L/kg-day
Age Sensitivity Factor	1.7	1	3	
Exposure Duration	70	25	4	years
Exposure Frequency	350	240	180	days/year

Assuming 100% DPM (CPF 1.1 [mg/kg-day]$^{-1}$)

Source No.	Source	70-Yr Residential Dose$_{air}$ (mg/kg-day)	C_{air} ($\mu g/m^3$)	Staff C_{air} ($\mu g/m^3$)	Dose$_{air}$ (mg/kg-day)	Students C_{air} ($\mu g/m^3$)	Dose$_{air}$ (mg/kg-day)
4	ECI Painting, Inc.	5.35E-10	0.0000	0.0000	2.79E-10	0.0000	4.74E-10
5	Geron	1.82E-07	0.0006	0.0006	9.50E-08	0.0006	1.61E-07
6	InfoImage	1.86E-06	0.0064	0.0064	9.71E-07	0.0064	1.65E-06
8	Latham & Watkins	3.78E-07	0.0013	0.0013	1.98E-07	0.0013	3.35E-07

Screening Level Risk Values - Staff Exposure Scenario [1]

Source No.	Source	Facility ID	Age Sensitivity Factor	Cancer Risk (per million)	Chronic HI	Acute HI	PM2.5 ($\mu g/m^3$)	Methodology
4	ECI Painting, Inc.	561	1.0	0.000	0.000	n/a	0.005	BAAQMD Screening Level values
5	Geron	16110	1.0	0.037	0.000	n/a	0.001	BAAQMD HRSA values
6	InfoImage	18216	1.0	0.381	0.001	n/a	0.001	Diesel engine distance multiplier
8	Latham & Watkins	17258	1.0	0.078	0.000	n/a	0.004	Diesel engine distance multiplier
	BAAQMD Significance Threshold			10.0	1.0	1.0	0.30	For each individual source
	Exceeds Threhold?			**Yes**	**Yes**	n/a	**Yes**	Sources 3 and 7 exceed threshold

Screening Level Risk Values - Student Exposure Scenario [2]

Source No.	Source	Facility ID	Age Sensitivity Factor	Cancer Risk (per million)	Chronic HI	Acute HI	PM2.5 ($\mu g/m^3$)	Methodology
4	ECI Painting, Inc.	561	3.0	0.000	0.000	n/a	0.005	BAAQMD Screening Level values
5	Geron	16110	3.0	0.030	0.000	n/a	0.001	BAAQMD HRSA values
6	InfoImage	18216	3.0	0.310	0.001	n/a	0.001	Diesel engine distance multiplier
8	Latham & Watkins	17258	3.0	0.063	0.000	n/a	0.004	Diesel engine distance multiplier
	BAAQMD Significance Threshold			10.0	1.0	1.0	0.30	For each individual source
	Exceeds Threhold?			**Yes**	**Yes**	n/a	**Yes**	Sources 3 and 7 exceed threshold

Sources: BAAQMD Stationary Source Screening Analysis Tool, Inquiry Form, Health Risk Screening Assessment (HRSA), and Diesel Engine

[1] New OEHHA Guidelines (2015) using 95th percentile 8-hour breathing rates (moderate intensity activity) are used to estimate the school-based screening risk values.
[2] BAAQMD Screening Level Cancer Risk Values are for 70-year residential exposures. Therefore, the cancer risk values were adjusted for a shorter 25-year exposure scenario for staff of the proposed school site.
[3] The cancer risk values were adjusted for a shorter 4-year exposure scenario for high school students of the proposed school site.

Table B2 - Stationary Source Screening
BAAQMD Permitted Sources

Stationary Source - Screening Evaluation

Advanced Screening Level Risk Values - 70-Year Residential Exposure Scenario

Source No.	Source	Facility ID	Distance Multiplier	Cancer Risk (per million)	Chronic HI	Acute HI	PM2.5 (μg/m³)	Methodology
3	3 Communications Randtron	2877						
	Generator			*4.82*	*2.36E-03*	*3.49E-05*	*8.69E-03*	BAAQMD Beta Calculator 1.3
			0.09	0.43	2.12E-04	3.14E-06	7.82E-04	Distance Adj for Diesel IC Engines (>1000ft)
	Wipe Cleaning, Spraybooths, etc.		n/a	0.00	9.62E-05	2.01E-03	0.00E+00	BAAQMD Beta Calculator 1.3
	Total for Facility			0.43	3.09E-04	2.01E-03	7.82E-04	
7	City of Menlo Park	3499	n/a	5.69	0.407	0.962	0.00E+00	BAAQMD Beta Calculator 1.3
	BAAQMD Significance Threshold			10.0	1.0	1.0	0.30	For each individual source
	Exceeds Threhold?			**No**	**No**	**No**	**No**	

Note: To adjust the screening cancer risk values from 70-year residential values to school-based values, the Dose and concentration of TACs, assuming 100% DPM, was back-calculated using the screening cancer risks values. Once the concentration of DPM was determined, the staff and student screening cancer risks were determined using the following school-based screening factors:

Screening Factors	Resident 70-Year	School Based Factors[1] Staff	Students	
Breathing Rate/Body Weight	302	230	520	L/kg-day
Age Sensitivity Factor	1.7	1	3	
Exposure Duration	70	25	4	years
Exposure Frequency	350	240	180	days/year

Assuming 100% DPM (CPF 1.1 [mg/kg-day]$^{-1}$)

Source No.	Source	70-Yr Residential Dose$_{air}$ (mg/kg-day)	70-Yr Residential C$_{air}$ (μg/m³)	Staff C$_{air}$ (μg/m³)	Staff Dose$_{air}$ (mg/kg-day)	Students C$_{air}$ (μg/m³)	Students Dose$_{air}$ (mg/kg-day)
3	L-3 Communications Randtron	2.32E-07	0.0008	0.0008	1.21E-07	0.0008	2.05E-07
7	City of Menlo Park	3.04E-06	0.0105	0.0105	1.59E-06	0.0105	2.69E-06

Advanced Screening Level Risk Values - Staff Exposure Scenario [1]

Source No.	Source	Facility ID	Age Sensitivity Factor	Cancer Risk (per million)	Chronic HI	Acute HI	PM2.5 (μg/m³)	Methodology
3	L-3 Communications Randtr	2877	1.0	0.05	3.09E-04	2.01E-03	7.82E-04	BAAQMD Beta Calculator & Dist. Adjustment
7	City of Menlo Park	3499	1.0	0.62	0.407	0.962	0.00E+00	BAAQMD Beta Calculator
	BAAQMD Significance Threshold			10.0	1.0	1.0	0.30	For each individual source
	Exceeds Threhold?			**No**	**No**	**No**	**No**	

Advanced Screening Level Risk Values - Student Exposure Scenario [2]

Source No.	Source	Facility ID	Age Sensitivity Factor	Cancer Risk (per million)	Chronic HI	Acute HI	PM2.5 (μg/m³)	Methodology
3	L-3 Communications Randtr	2877	3.0	0.04	3.09E-04	2.01E-03	7.82E-04	BAAQMD Beta Calculator & Dist. Adjustment
7	City of Menlo Park	3499	3.0	0.51	0.407	0.962	0.00E+00	BAAQMD Beta Calculator
	BAAQMD Significance Threshold			10.0	1.0	1.0	0.30	For each individual source
	Exceeds Threhold?			**No**	**No**	**No**	**No**	

Sources: BAAQMD Stationary Source Screening Analysis Tool, Inquiry Form, Health Risk Screening Assessment (HRSA), and Diesel Engine

[1] New OEHHA Guidelines (2015) using 95th percentile 8-hour breathing rates (moderate intensity activity) are used to estimate the school-based screening risk values.
[2] BAAQMD Screening Level Cancer Risk Values are for 70-year residential exposures. Therefore, the cancer risk values were adjusted for a shorter 25-year exposure scenario for staff of the proposed school site.
[3] The cancer risk values were adjusted for a shorter 4-year exposure scenario for high school students of the proposed school site.

Table B3 - Summary of Health Risks

Health Risk Summary

Staff Exposure Scenario - Health Risk Values [1]

Source No.	Source	Cancer Risk (per	Chronic HI	Acute HI	PM2.5 ($\mu g/m^3$)	Methodology
1	Highway 101	1.70	0.015	0.016	0.15	Highway Screening Analysis Tool
2	Highway 84	0.16	0.001	0.004	0.02	Highway Screening Analysis Tool
3	L-3 Communications Randtron	0.05	0.000	0.002	0.001	BAAQMD Beta Calculator and Distance Adjustment
4	ECI Painting, Inc.	0.00	0.000	n/a	0.005	BAAQMD screening levels
5	Geron	0.04	0.000	n/a	0.001	BAAQMD screening levels
6	InfoImage	0.38	0.001	n/a	0.001	BAAQMD screening levels
7	City of Menlo Park	0.62	0.41	0.96	0.00	BAAQMD Beta Calculator
8	Latham & Watkins	0.08	0.000	n/a	0.004	BAAQMD screening levels
	BAAQMD Significance Threshold	10.0	1.0	1.0	0.30	For each individual source
	Exceeds Threhold?	**No**	**No**	**No**	**No**	
	Cumulative Total	3.03	0.42	0.98	0.17	All sources
	BAAQMD Significance Threshold	100	10.0	10.0	0.80	
	Exceeds Threhold?	**No**	**No**	**No**	**No**	

Student Exposure Scenario - Health Risk Values [1]

Source No.	Source	Cancer Risk	Chronic HI	Acute HI	PM2.5 ($\mu g/m^3$)	Methodology
1	Highway 101	1.38	0.015	0.016	0.15	Highway Screening Analysis Tool
2	Highway 84	0.13	0.001	0.004	0.02	Highway Screening Analysis Tool
3	L-3 Communications Randtron	0.04	0.000	0.002	0.001	BAAQMD Beta Calculator and Distance Adjustment
4	ECI Painting, Inc.	0.00	0.000	n/a	0.005	BAAQMD screening levels
5	Geron	0.03	0.000	n/a	0.001	BAAQMD screening levels
6	InfoImage	0.31	0.001	n/a	0.001	BAAQMD screening levels
7	City of Menlo Park	0.51	0.41	0.96	0.00	BAAQMD Beta Calculator
8	Latham & Watkins	0.06	0.000	n/a	0.004	BAAQMD screening levels
	BAAQMD Significance Threshold	10.0	1.0	1.0	0.30	For each individual source
	Exceeds Threhold?	**No**	**No**	**No**	**No**	
	Cumulative Total	2.47	0.42	0.98	0.17	All sources
	BAAQMD Significance Threshold	100	10.0	10.0	0.80	
	Exceeds Threhold?	**No**	**No**	**No**	**No**	

[1] BAAQMD Screening Level Cancer Risk Values for stationary and mobile sources are for 70-year residential exposures. As the exposure duration and frequency per year for residents is larger than for adult staff or students of a school, the residential screening cancer risks are conservative for occupants of the proposed school site.

APPENDIX E:

BIOLOGICAL RESOURCES SPECIAL-STATUS SPECIES

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**
San Mateo thorn-mint (*Acanthomintha duttonii*)	FE; SE; CRPR1B.1	Located in San Mateo County.	Chaparral, valley and foothill grassland, or coastal scrub. Locally occurs in serpentine bunchgrass grassland; 50-300 m.	Annual herb, April - June	**None.** There is no potential habitat on-site and the only CNDDB occurrence within 5 miles has been extirpated.
Franciscan onion (*Allium peninsulare var. franciscanum*)	CRPR 1B.2	Coastal mid California, from Monterey to Mendocino Counties.	Cismontane woodland, valley and foothill grasslands. Often on dry hillsides and in serpentine bunchgrass grasslands; 52-300 m.	Perennial bulbiferous herb, May - June	**None.** There is no potential habitat on-site; there are three known occurrences within 5 miles of the site to the west.
bent-flowered fiddleneck (*Amsinckia lunaris*)	CRPR 1B.2	Mid California, including Monterey, Santa Cruz, San Mateo, Marin, Alameda, Contra Costa, Napa, Lake and Colusa counties.	Coastal bluff scrub, cismontane woodland or valley and foothill grassland; 3-500 m.	Annual herb, March - June	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Anderson's manzanita (*Arctostaphylos andersonii*)	CRPR 1B.2	Mid California including Monterey, Santa Cruz, San Mateo, Santa Clara, and Alameda counties.	Broadleaved upland forest, mixed evergreen forest, North coast coniferous forest including open sites in redwood forest, chaparral; 60-760 m.	Perennial evergreen shrub, November - May	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**
Montara manzanita (*Arctostaphylos montaraensis*)	CRPR 1B.2	Endemic to San Mateo County.	Maritime chaparral or coastal; 150-500 m.	Perennial evergreen shrub, January - March	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Kings Mountain manzanita (*Arctostaphylos regismontana*)	CRPR 1B.2	Mid California including Santa Cruz, San Mateo, and Santa Clara counties.	Granite or sandstone outcrops in chaparral, coniferous, broadleaved upland and evergreen forests; 305-730 m.	Perennial evergreen shrub, January – April	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Coastal marsh milk-vetch (*Astragalus pynostachyus* var. *pynostachyus*)	CRPR 1B.2	Endemic to Humboldt, Marin and San Mateo Counties.	Coastal dunes (mesic), coastal scrub or marshes and swamps (coastal salt, streamside); 0-30 m.	Perennial herb, April-October	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Alkali milk-vetch (*Astragalus tener* var. *tener*)	CRPR 1B.2	Endemic to the San Francisco Bay Area and surrounding counties.	Playas, valley and foothill grassland (adobe clay) or vernal pools on alkaline soils; 1-60 m.	Annual herb, March-June	**None.** There is no potential habitat on-site; there is one known occurrence within 5 miles of the site on the bay shore.
round-leaved filaree (*California macrophylla*)	CRPR 1B.1	Scattered locations throughout California west of the Sierra Nevada and south of Red Bluff.	Cismontane woodland or valley and foothill grassland on clay soils; 15-1200 m.	Annual herb, March-May	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**
Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*)	CRPR 1B.1	Throughout western California from San Luis Obispo to Solano County.	Valley and foothill grasslands with alkaline or clay soils; 0-230 m.	Annual herb, May - November	**None.** There is no potential habitat on-site; there is one known occurrence within 5 miles of the site on the bay shore.
Point Reyes bird's beak (*Chloropyron maritimum* ssp. *palustre*)	CRPR 1B.2	Extant occurrences in Humboldt, Marin, San Francisco and Sonoma Counties.	Marshes and swamps (coastal salt); 0-10 m.	Annual herb (hemiparasitic), June-October	**None.** There is no potential habitat on-site; there are three known occurrences within 5 miles of the site on the bay shore.
San Francisco Bay spineflower (*Chorizanthe cuspidata* var. *cuspidata*)	CRPR 1B.2	Endemic to Marin, San Francisco, San Mateo and possibly Sonoma Counties.	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub on sandy soils; 3-215 m.	Annual herb, April-August	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Crystal Springs fountain thistle (*Cirsium fontinale* var. *fontinale*)	FE; SE; CRPR 1B.1	Found exclusively in San Mateo county.	Valley and foothill grasslands and chaparral including serpentine seeps and grassland; 45-175 m.	Perennial herb, May - October	**None.** There is no potential habitat on-site; there are two known occurrences within 5 miles of the site to the west.
lost thistle (*Cirsium praeteriens*)	CRPR 1A	Endemic to Santa Clara County but extirpated from the County.	Unknown habitat; 0-100 m.	Perennial herb, June-July	**None.** This species is presumed extinct in California.

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**
San Francisco collinsia (*Collinsia multicolor*)	CRPR 1B.2	Mid-coastal California from Monterey to Marin county including Santa Clara county.	Moist shady woodland, closed-cone coniferous forests and coastal scrub. Occasionally found in serpentine; 30-250 m.	Annual herb, March – May	**None.** There is no potential habitat on-site; there are two known occurrences within 5 miles of the site on the Stanford campus.
western leatherwood (*Dirca occidentalis*)	CRPR 1B.2	San Francisco Bay area including Santa Clara to Marin county and east to Alameda county.	Cool, moist slopes in foothill woodland and riparian forests. Mesic environments in broadleaved upland forests, chaparral and coniferous woodlands and mixed evergreen and oak woodlands; 25-425 m.	Perennial deciduous shrub, January – April.	**None.** There is no potential habitat on-site; there is one known occurrence within 5 miles of the site near the Stanford campus.
Ben Lomond buckwheat (*Eriogonum nudum* var. *decurrens*)	CRPR 1B.1	Endemic to Alameda, Santa Clara and Santa Cruz Counties.	Chaparral, cismontane woodland, lower montane coniferous forest (maritime ponderosa pine sandhills); 50-800 m.	Perennial herb, June-October	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
San Mateo woolly sunflower (*Eriophyllum latilobum*)	FE, SE, CRPR 1B.1	San Mateo and Napa counties.	Cismontane and oak woodland, often on roadcuts; found on and off of serpentine and on grassy hillsides; 45-150m.	Perennial herb, April – June	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**
Hoover's button-celery (*Eryngium aristulatum* var. *hooveri*)	CRPR 1B.1	Endemic to Alameda, San Benito, Santa Clara, San Diego and San Luis Obispo Counties.	Vernal pools; 3-45 m.	Annual/perennial herb, July-August	**None.** There is no potential habitat on-site; there are two known occurrences within 5 miles of the site on the Bay shore and on the Stanford campus.
San Joaquin spearscale (*Extriplex joaquinana*)	CRPR 1B.2	Endemic to the Coast Ranges and Central Valley of central California.	Chenopod scrub, meadows and seeps, playas and valley and foothill grassland in alkaline soils; 1-835 m.	Annual herb, April-October	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
minute pocket moss (*Fissidens pauperculus*)	CRPR 1B.2	Along the coast from Santa Cruz to the northern border of California.	North Coast coniferous forest on damp soil along the coast, in dry streambeds and on stream banks; 10-1000 m.	Moss	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Hillsborough chocolate lily (*Fritillaria biflora* var. *ineziana*)	CRPR 1B.1	Endemic to San Mateo County.	Cismontane woodland or valley and foothill grasslands on serpentine soils.	Perennial herb, March – April	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
fragrant fritillary (*Fritillaria liliacea*)	CRPR 1B.2	Found throughout northern and central California wherever there is suitable habitat.	Cismontane woodland and coastal scrub and prairie, in valley and foothill grasslands (often serpentine bunchgrass grassland); 3-410 m.	Perennial bulbiferous herb, February – April	**None.** There is no potential habitat on-site; there is one known occurrence within 5 miles of the site near the Stanford campus.

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**
short-leaved evax (*Hesperevax sparsiflora* var. *brevifolia*)	CRPR 1B.2	Occurs along the coast from the Oregon border to near Santa Cruz.	Coastal bluff scrub (sandy), coastal dunes or coastal prairie; 0-215 m.	Annual herb, March-June	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Marin western flax (*Hesperolinon congestum*)	FT; ST; CRPR 1B.1	Found only around the San Francisco peninsula in San Mateo and Marin Counties.	Chaparral, valley and foothill grassland, especially in serpentine bunchgrass grassland and serpentine barrens; 5-370 m.	Annual herb, April – July	**None.** There is no potential habitat on-site; there are two known occurrences within 5 miles of the site to the west.
Loma Prieta hoita (*Hoita strobilina*)	CRPR 1B.1	Endemic to Alameda, Contra Costa, Santa Clara and Santa Cruz Counties.	Chaparral, cismontane woodland and riparian woodland, usually serpentinite and mesic; 30-860 m. elevation.	Perennial herb, May-October	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Contra Costa goldfields (*Lasthenia conjugans*)	FE, CRPR 1B.1	Endemic to western California from Santa Rosa to Monterey.	Cismontane woodland, playas (alkaline), valley and foothill grassland and vernal pools; 0-470 m. elevation.	Annual herb, March-June	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
legenere (*Legenere limosa*)	CRPR 1B.1	Endemic to the Central Valley and Inner Coast Ranges from Redding to Salinas.	Vernal pools; 0-880 m.	Annual herb, April-June	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**
Crystal Springs lessingia (*Lessingia arachnoidea*)	CRPR 1B.2	Endemic to San Mateo county and Sonoma Counties.	Cismontane woodland, coastal scrub or valley and foothill grassland on serpentine soils, often on roadsides; 60 – 200m.	Annual herb ; July – October	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
coast lily (*Lilium maritimum*)	CRPR 1B.1	California endemic; extant occurrences in Mendocino, Marin and Sonoma Counties.	Broad-leafed upland forest, closed-cone coniferous forest, coastal prairie, coastal scrub, marshes and swamps (freshwater) or North Coast coniferous forest, sometimes on roadsides; 5-475 m.	Perennial bulbiferous herb, May-August	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
arcuate bush mallow (*Malacothamnus arcuatus*)	CRPR 1B.2	Found throughout the San Francisco peninsula and the south bay area throughout San Mateo and Santa Clara counties and Merced county.	Ultramafic chaparral, gravelly alluvium. Locally, in openings in mixed evergreen forests; 15-355 m.	Perennial evergreen shrub, April – September	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Davidson's bush mallow (*Malacothamnus davidsonii*)	CRPR 1B.2	Throughout California, found in San Mateo, Monterey, San Luis Obispo, and Los Angeles counties.	Sandy washes within coastal scrub, chaparral, and riparian woodland, at elevations 185 – 855m.	Perennial deciduous shrub, June – January	**None.** There is no potential habitat on-site; this species is known from the Palo Alto Quad.

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**
woodland woolythreads (*Monolopia gracilens*)	CRPR 1B.2	Through central California from San Mateo and Contra Costa counties south to San Luis Obispo county.	Grassy openings in chaparral, valley and foothill grasslands (serpentine), cismontane woodland, broadleafed upland forests, North coast coniferous forest. Sandy to rocky soils; 100-1200 m.	Annual herb, February – July	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
pincushion navarettia (*Navarretia myersii*)	CRPR 1B.1	Mainly central part of Central Valley, one location on San Francisco peninsula.	Vernal pools, often acidic; 20-330 m.	Annual herb, April – May	**None.** There is no potential habitat on-site; this species is known from the Redwood Point Quad.
Dudley's lousewort (*Pedicularis dudleyi*)	SR; CRPR 1B.2	Throughout central coastal California from San Mateo county south to San Luis Obispo county.	Chaparral, valley and foothill grassland and North coast coniferous forest, particularly deep shady woods and steep cut banks in older coast redwood forests and maritime chaparral; 60-900 m.	Perennial herb, April – June	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
white-rayed pentachaeta (*Pentachaeta bellidiflora*)	FE; SE; CRPR 1B.1	California endemic; extant occurrences in San Mateo County.	Cismontane woodland or valley and foothills grassland (often serpentinite); 35-620 m.	Annual herb, March – May	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**
white-flowered rein orchid (*Piperia candida*)	CRPR 1B.2	Through northern coastal California from Del Norte county south to Santa Cruz county.	Broadleafed upland forest, lower montane coniferous forest, North Coast coniferous forest. Often on mossy banks and rock outcrops or in the forest duff; 30-1310 m.	Perennial herb, May - September	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Choris' popcornflower (*Plagiobothrys chorisianus* var. *chorisianus*)	CRPR 1B.2	Endemic to coastal central California including Santa Cruz , San Francisco and San Mateo Counties.	Chaparral, coastal prairie or coastal scrub on mesic sites; 15-160 m.	Annual herb, March – June	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
hairless popcornflower (*Plagiobothrys glaber*)	CRPR 1A	Endemic to Alameda, Marin, San Benito and Santa Clara Counties.	Meadows and seeps (alkaline) and marshes and swamps (coastal salt); 15-180 m. elevation.	Annual herb, March-May	**None.** This species is presumed extinct in California.
Oregnon polemonium (*Polemonium carneum*)	CRPR 2B.2	Occurs in northern California and in the San Francisco Bay Area.	Coastal prairie, coastal scrub or lower montane coniferous forest; 0-1830 m.	Perennial herb, April-September	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
chaparral ragwort (*Senecio aphanactis*)	CRPR 2B.2	Occurs in western California from Concord to the Mexican border.	Chaparral, cismontane woodland and coastal scrub, sometimes in serpentine soils; 15-800 m.	Annual herb, January-April	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**
San Francisco campion (*Silene verecunda* ssp. *verecunda*)	CRPR 1B.2	Endemic to Santa Cruz, San Francisco, San Mateo and Sutter Counties.	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub or valley and foothills grassland on sandy soils; 30-645 m.	Perennial herb, March – August	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
slender-leaved pondweed (*Stuckenia filiformis* ssp. *alpina*)	CRPR 2B.2	Occurs in Northern California in the Inner Coast Ranges and Sierra Nevadas from east of Redding to near San Jose.	Marshes and swamps (assorted shallow freshwater); 300-2150 m.	Perennial rhizomatous herb, May-July	**None.** There is no potential habitat on-site; there is one known occurrence within 5 miles of the site near the Stanford campus.
California seablite (*Suaeda californica*)	FE, CRPR 1B.1	Endemic to coastal California in the San Francisco Bay Area and near San Luis Obispo.	Marshes and swamps (coastal salt); 0-15 m.	Perennial evergreen shrub, July-October	**None.** There is no potential habitat on-site; there is one known occurrence within 5 miles of the site on the bay shore.
showy rancheria clover (*Trifolium amoenum*)	FE; CRPR 1B.1	Marin, Sonoma, Napa Solano, and San Mateo counties.	Coastal bluff scrub, valley and foothill grassland (sometimes serpentine), often open sunny sites; 5-415 m.	Annual herb, April – June	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
saline clover (*Trifolium hydrophilum*)	CRPR 1B.2	Endemic to San Francisco Bay Area and surrounding counties.	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools; 0-300 m.	Annual herb, April – June	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**
San Francisco owl's clover (*Triphysaria floribunda*)	CRPR 1B.2	Endemic to Marin, San Francisco and San Mateo Counties.	Coastal prairie, coastal scrub or valley and foothill grassland, usually serpentinite; 10-160 m.	Annual herb, April-June	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
caper-fruited tropidocarpum (*Tropidocarpum capparideum*)	CRPR 1B.1	California endemic; extant occurrences in Fresno, Monterey and San Luis Obispo Counties.	Valley and foothill grassland (alkaline hills); 1-455 m.	Annual herb, March-May	**None.** This species is presumed extirpated from the project region.

Table 1. Special-status Plants Potentially Occurring in the Project Area					
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Life Form, Blooming Period**	**Potential Occurrence in the Project Area[b]**

[a] Status explanations:

Federal:

FE = Listed as endangered under the Federal Endangered Species Act.

FT = Listed as threatened under the Federal Endangered Species Act.

State:

SE= Listed as endangered under the California Endangered Species Act.

ST= Listed as threatened under the California Endangered Species Act.

SR= Listed as rare under the California Endangered Species Act.

California Rare Plant Rank:

1B**=** Plants Rare, Threatened, or Endangered in California and Elsewhere

2B= Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

0.1-Seriously threatened in California

0.2-Fairly threatened in California

[b] Potential Occurrence explanations:

Present: Species was observed on the project site, or recent species records (within five years) from literature are known within the project area.

High: The CNDDB or other reputable documents record the occurrence of the species off-site, but within a 5-mile radius of the project area and within the last 10 years. High-quality suitable habitat is present within the project area.

Moderate: Species does not meet all terms of High or Low category. For example: CNDDB or other reputable documents may record the occurrence of the species near but beyond a 5-mile radius of the project area, or some of the components representing suitable habitat are present within or adjacent to the project area, but the habitat is substantially degraded or fragmented.

Low: The CNDDB or other documents may or may not record the occurrence of the species within a 5-mile radius of the project area. However, few components of suitable habitat are present within or adjacent to the project area.

None: CNDDB or other documents do not record the occurrence of the species within or reasonably near the project area and within the last 10 years, and no or extremely few components of suitable habitat are present within or adjacent to the project area; or site is outside of specie's range.

Sources:

1. *California Department of Fish and Wildlife (CDFW), California Natural Diversity Database (CNDDB) RareFind 5, February 23, 2016*
2. *California Native Plant Society (CNPS), Rare and Endangered Plant Inventory, February 23, 2016*

Plant species listed in the CNDDB and/or CNPS Rare Plant Inventory that do not meet the definition for special-status species

California androsace, *Androsace elongata* ssp. *acuta,* CRPR 4.2
Brewer's calandrinia, *Calandrinia breweri*, CRPR 4.2
Oakland star tulip, *Calochortus umbellatus*, CRPR 4.2
Johnny-nip, *Castilleja ambigua* var. *ambigua*, CRPR 4.2
Santa Clara red ribbons, *Clarkia concinna* ssp. *automixa*, CRPR 4.3
Clustered lady's-slipper, *Cypripedium fasciculatum*, CRPR 4.2
Mountain lady's-slipper, *Cypripedium montanum*, CRPR 4.2
California bottle-brush grass, *Elymus californicus*, CRPR 4.3
San Francisco wallflower, *Erysimum franciscanum*, CRPR 4.2
Coast iris, *Iris longipetala*, CRPR 4.2
Serpentine leptosiphon, *Leptosiphon ambiguus*, CRPR 4.2
Woolly-headed lessingia, *Lessingia hololeuca*, CRPR 3
San Mateo tree lupine, *Lupinus arboreus* var. *eximius*, CRPR 3.2
Mt. Diablo cottonweed, *Micropus amphibolus*, CRPR 3.2
Lobb's aquatic buttercup, *Ranunculus lobbii*, CRPR 4.2
Methuselah's beard lichen, *Usnea longissima*, CRPR 4.2

CNPS, Rare Plant Program. 2016. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 23 February 2016].

Table 2. Special-status Animals Potentially Occurring in the Project Area				
Common Name (*Scientific Name*)	**Listing Status[a]**	**Geographic Distribution in California**	**Habitat Requirements**	**Potential Occurrence in the Project Area[b]**
Invertebrates				
Bay checkerspot butterfly (*Euphydryas editha bayensis*)	FT	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay.	*Plantago erecta* is the primary host plant, *Castilleja densiflorus* and *C. purpurscens* are secondary host plants.	**None.** There is no potential habitat on-site; there is one known occurrence within 5 miles of the site to the west.
Mrytle's silverspot (*Speyeria zerene myrtleae*)	FE	Restricted to foggy coastal dunes/hills of the Point Reyes peninsula; extirpated from coastal San Mateo County.	Larval foodplant thought to be *Viola adunca.*	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Fish				
steelhead- Central California Coast DPS (*Oncorhynchus mykiss irideus*)	FT	This distinct population segment (DPS) includes all anadromous *O. mykiss* (steelhead) populations from the Russian River south to Soquel Creek and to, but not including, the Pajaro River. Populations in the San Francisco and San Pablo Basins are also included.	Adults migrate from a marine environment into the freshwater streams and rivers of their birth in order to mate (called anadromy). Unlike other Pacific salmonids, they can spawn more than one time (called iteroparity). Migrations can be hundreds of miles.	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
longfin smelt (*Spirinchus thaleichthys*)	FC ST CSSC	Slightly upstream from Rio Vista and Medford Island through Suisun Bay and Suisun Marsh; San Pablo Bay; San Francisco Bay; Gulf of the Farallones; Humboldt Bay and Eel River estuary	Found in open water of estuaries, mostly in the middle or bottom of water columns, prefer salinities of 15-30 ppt. but can be found in completely fresh water to almost pure sea water.	**None.** There is no potential habitat on-site; there is one known occurrence within 5 miles of the site in the San Francisco Bay.

Amphibians and Reptiles				
California tiger salamander (*Ambystoma californiense*)	FT ST CSSC	Endemic to California, found in isolated populations the Central Valley and Central Coast ranges.	This species needs underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal wetlands for breeding.	**None.** There is no potential habitat on-site; there are four known occurrences within 5 miles of the site near the Stanford campus.
foothill yellow-legged frog (*Rana boylii*)	CSSC	Occurs in the foothills of the western side of the Sierra Nevada mountains from the northern border of the state to the Tehachapi mountains.	Inhabits partly shaded, shallow streams and rifles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg laying, need at least 15 weeks for metamorphisis.	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
California red-legged frog (*Rana draytonii*)	FT	Endemic to California and northern Baja California.	Inhabits lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	**None.** There is no potential habitat on-site; there is one known occurrence within 5 miles of the site to the west.
Western pond turtle (*Emys marmorata*)	CSSC	Occurs from Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley and on western slope of Sierra Nevada.	Inhabits ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests.	**None.** There is no potential habitat on-site; there are two known occurrences within 5 miles of the site near the Stanford campus.
San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)	FE SE	Occurs in the vicinity of freshwater marshes, ponds and slow moving streams in San Mateo County and extreme northern Santa Cruz County.	Prefers dense cover and water depths of at least one foot, upland areas near water are also very important.	**None.** There are no freshwater marshes, ponds or streams on or near the site.

Birds				
white-tailed kite (*Elanus lecurus*)	CFP	Year-round resident in lowland areas west of Sierra Nevada from head of Sacramento Valley south, including coastal valleys and foothills, to western San Diego County at Mexico border.	Inhabits low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands that are used for foraging	**None.** There is no potential habitat on-site; there are three known occurrences within 5 miles of the site on Bair Island.
northern harrier (*Circus cyaneus*)	CSSC	Occurs throughout lowland California; has been recorded in fall at high elevations	Inhabits grasslands, meadows, marshes, and seasonal and agricultural wetlands	**None.** There is no potential habitat on-site; there are two known occurrences within 5 miles of the site on the bay shore.
American peregrine falcon (*Falco peregrine anatus*)	CFP	Occurs throughout the Central Valley, coastal areas and northern mountains of California.	Riparian areas, wetlands, lakes and other aquatic features provide important breeding and foraging habitat for this species. Nests on cliffs or man-made structures such as buildings and bridges; feeds on birds.	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
Ridgeway (California clapper) rail (*Rallus obsoletus* spp. *obsoletus*)	FE SE	This California endemic inhabits salt water and brackish marshes traversed by tidal sloughs in the vicinity of the San Francisco Bay.	Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.	**None.** There is no potential habitat on-site; there are seven known occurrences within 5 miles of the site on the bay shore.
California black rail (*Laterallus jamaicensis* ssp. *coturniculus*)	ST	This California endemic subspecies of the black rail (*Laterallus jamaicensis*) occurs in the San Francisco Bay region, parts of the Central Valley and at the southeastern border of the State.	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. It needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	**None.** There is no potential habitat on-site; there are three known occurrences within 5 miles of the site on the bay shore.
western snowy plover (*Charadrius alexandrinuss nivosus*- Pacific population)	FT CSSC	The Pacific population of western snowy plover occurs along the entire coastline of California.	Occurs on sandy beaches, salt pond levees and shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**None.** There is no potential habitat on-site; there are five known occurrences within 5 miles of the site on the bay shore.

California least tern (*Sternula antillarum browni*)	FE SE	Nests along the coast from San Francisco Bay south to Northern Baja California.	Colonial breeder on bare or sparsely vegetated flat substrates, sandy beaches, alkali flats, landfills or paved areas.	**None.** There is no potential habitat on-site; there are two known occurrences within 5 miles of the site on the bay shore.
marbled murrelet (*Brachyramphus marmoratus*)	FT SE	Feeds near-shore; nests inland along coast from Eureka to Oregon border & from Half Moon Bay to Santa Cruz.	Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir.	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
burrowing owl (*Athene cunicularia*)	CSSC	Year-round resident throughout much of the State, except the coastal counties north of Marin and mountainous areas.	Occurs in open, dry annual or perennial grasslands, deserts and scrublands characterized by low growing vegetation. Nests in small mammal burrows, particularly those of the California ground squirrel.	**None.** There is no potential habitat on-site; there are two known occurrences within 5 miles of the site on the bay shore.
short-eared owl (*Asio flammeus*)	CSSC	Year-round resident in certain parts of California; breeds regularly in the Great Basin region and locally in the Sacramento-San Joaquin River Delta, breeds periodically in the Central Coast and San Joaquin Delta.	Found in swamp lands, both fresh and salt, lowland meadows and agricultural fields. Tule patches or tall grass are needed for nesting and day time seclusion; nests on dry ground in depression concealed in vegetation.	**None.** There is no potential habitat on-site; there is one known occurrence within 5 miles of the site on Bair Island.
long-eared owl (*Asio otus*)	CSSC	Occurs throughout the state except in the Central Valley, in pockets along the coast and in the far central south.	Inhabits riparian bottomlands grown to tall willows and cottonwoods and belts of live oak parallel to stream coarses. Require adjacent open land productive of mice and the presence of old nests of crows, hawks or magpies for breeding.	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.

bank swallow (*Riparia riparia*)	ST	Occurs primarily around the remaining natural river banks of the Sacramento and Feather Rivers in the Sacramento Valley.	Colonial nester, nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine textured/sandy soils near streams, rivers, lakes or ocean to dig nesting hole.	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
saltmarsh common yellow throat (*Geothlypis trichas sinuosa*)	CSSC	This supspecies of the common yellow throat (*Geothlypis trichas*) is endemic to the fresh and salt water marshes of the San Francisco Bay region.	Requires thick, continuous cover down to water surface for foraging; and tall grasses, tule patches and willows for nesting.	**None.** There is no potential habitat on-site; there are four known occurrences within 5 miles of the site on the bay shore.
Alameda song sparrow (*Melospiza melodia pusillula*)	CSSC	This California endemic subspecies of song sparrow (*Melospiza melodia*) is a resident of salt marshes bordering south arm of San Francisco Bay.	Inhabits *Salicornia* marshes, nests low in *Grindelia* bushes (high enough to escape high tides) and in *Salicornia.*	**None.** There is no potential habitat on-site; there are nine known occurrences within 5 miles of the site on the Bay shore and near the Stanford campus.
Tricolored blackbird (*Agelaius tricolor*)	CSSC (nesting colony)	Permanent resident in Central Valley from Butte to Kern Counties; breeds at scattered coastal locations from Marin to San Diego Counties and at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties.	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grain fields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony.	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.

Mammals				
pallid bat (*Antrozous pallidus*)	CSSC	Throughout California except high Sierra from Shasta to Kern Counties and northwest coast, primarily at lower and mid-elevations	Inhabits deserts, grasslands, shrublands, woodlands and forests; most common in open dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures, very sensitive to disturbance of roosting sites.	**Low.** Habitat quality for bats is low on the site and the amount of human disturbance likely precludes this species. There are two known occurrences within 5 miles of the site on the Bay shore and near the Stanford campus.
Townsend's big-eared bat (*Corynorthinus townsendii*)	SC CSSC	Throughout California in a wide variety of habitats; most common in mesic sites.	Requires caves, mines, tunnels, buildings, or other human-made structures for roosting, extremely sensitive to human disturbance.	**None.** Habitat quality for bats is low on the site and the amount of human disturbance likely precludes this species. There are no known occurrences within 5 miles of the site.
San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*)	CSSC	This California endemic is found throughout the San Francisco Bay area in grasslands, scrub and wooded areas.	Forest habitats of moderate canopy and moderate to dense understory. May prefer chaparral and redwood habitats. Constructs nests of shredded leaves, grass and other material. May be limited by availability of nest-building materials.	**None.** There is no potential habitat on-site and there are no known occurrences within 5 miles of the site.
saltmarsh harvest mouse (*Reithrodontomys raviventris*)	FE SE	This California endemic occurs only in the saline emergent wetlands of the San Francisco Bay and its tributaries.	Pickleweed is the primary habitat of this non-burrowing mammal. It builds loosely organized nests and requires higher areas to escape flooding.	**None.** There is no potential habitat on-site; there are ten known occurrences within 5 miles of the site on the bay shore
saltmarsh wandering shrew (*Sorex vagrans halicoetes*)	CSSC	Endemic to the salt marshes of the south arm of the San Francisco Bay.	Inhabits medium-high marsh 6-8 feet above sea level where abundant driftwood is scattered among *Salicornia.*	**None.** There is no potential habitat on-site; there are three known occurrences within 5 miles of the site on the bay shore

American badger (*Taxidea taxus*)	CSSC	Occurs throughout California and the western United States and Canada.	Inhabits a variety of open habitats with friable soils.	**None.** There is no potential habitat on-site; there are two known occurrences within 5 miles of the site near the Stanford campus.

[a] Status explanations:

Federal:

FE = Listed as endangered under the Federal Endangered Species Act.

FT = Listed as threatened under the Federal Endangered Species Act.

State:

SE= Listed as endangered under the California Endangered Species Act.

ST= Listed as threatened under the California Endangered Species Act.

SC= Candidate for listing under the California Endangered Species Act.

CSSC = Species of Special Concern designated by California Department of Fish and Game

CFP = Fully Protected Species under California Fish and Game Code.

[b] Potential Occurrence explanations:

Present: Species was observed on the project site, or recent species records (within five years) from literature are known within the project area.

High: The CNDDB or other reputable documents record the occurrence of the species off-site, but within a 10-mile radius of the project area and within the last 10 years. High-quality suitable habitat is present within the project area.

Moderate: Species does not meet all terms of High or Low category. For example: CNDDB or other reputable documents may record the occurrence of the species near but beyond a 10-mile radius of the project area, or some of the components representing suitable habitat are present within or adjacent to the project area, but the habitat is substantially degraded or fragmented.

Low: The CNDDB or other documents may or may not record the occurrence of the species within a 10-mile radius of the project area. However, few components of suitable habitat are present within or adjacent to the project area.

None: CNDDB or other documents do not record the occurrence of the species within or reasonably near the project area and within the last 10 years, and no or extremely few components of suitable habitat are present within or adjacent to the project area.

Sources:

1. *California Department of Fish and Wildlife (CDFW), California Natural Diversity Database (CNDDB) RareFind 5, February 24, 2016*

Animal species listed in the CNDDB that do not meet the definition for special-status species

Edgewood blind harvestman, *Calicina minor*
Edgewood micro-blind harvestman, *Microcina edgewoodensis*
*obscure bumble bee, *Bombus caliginosus*
*Crotch bumble bee, *Bombus crotchii*
*western bumble bee, *Bombus occidentalis*
monarch- California overwintering population, *Danaus plexippus* population 1
Ricksecker’s water scavenger beetle, *Hydrochara rickseckeri*
San Francisco forktail damselfly, *Ischnura gemina*
unsilvered fritillary, *Speyeria adiaste adiaste*
mimic tryonia, *Tryonia imitator*
*California giant salamander, *Dicamptodon ensatus*
Cooper’s hawk, *Accipiter cooperii*
*great blue heron, *Ardea Herodias*
*snowy egret, *Egretta thula*
black-crowned night heron, *Nycticorax nycticorax*
*double-crested cormorant, *Phalacrocorax auritus*
*Santa Cruz kangaroo rat, *Dipodomys venustus venustus*
*hoary bat, *Lasiurus cinereus*
Yuma myotis, *Myotis yumanensis*

*= known occurrences within 5 miles of the site

APPENDIX F:

CULTURAL / TRIBAL CULTURAL RESOURCES CONSULTATION INFORMATION

- F1: Cultural and Historic Record Searches
- F2: Department of Parks and Recreation: Primary Historic Record Form
- F3: MIG|TRA Historic Evaluation

APPENDIX F1:

CULTURAL AND HISTORIC RECORD SEARCHES

MIG | TRA ENVIRONMENTAL SCIENCES

March 12, 2015

Mr. Brian Much
Coordinator
Northwest Information Center
150 Professional Center Drive, Suite E
Rohnert Park, 94928

SUBJECT: Non-confidential Records Search for the SUHSD 150 Jefferson Drive High School Project

Dear Mr. Much,

MIG|TRA is preparing an Initial Study/Mitigated Negative Declaration (IS/MND) pursuant to the California Environmental Quality Act (CEQA) for the Sequoia Union High School District (SUHSD) 150 Jefferson Drive High School Project in Menlo Park, California. The SUHSD is proposing the acquisition of a property at 150 Jefferson Drive in the City of Menlo Park, California (94025) for development of a new high school with capacity for up to 400 students.

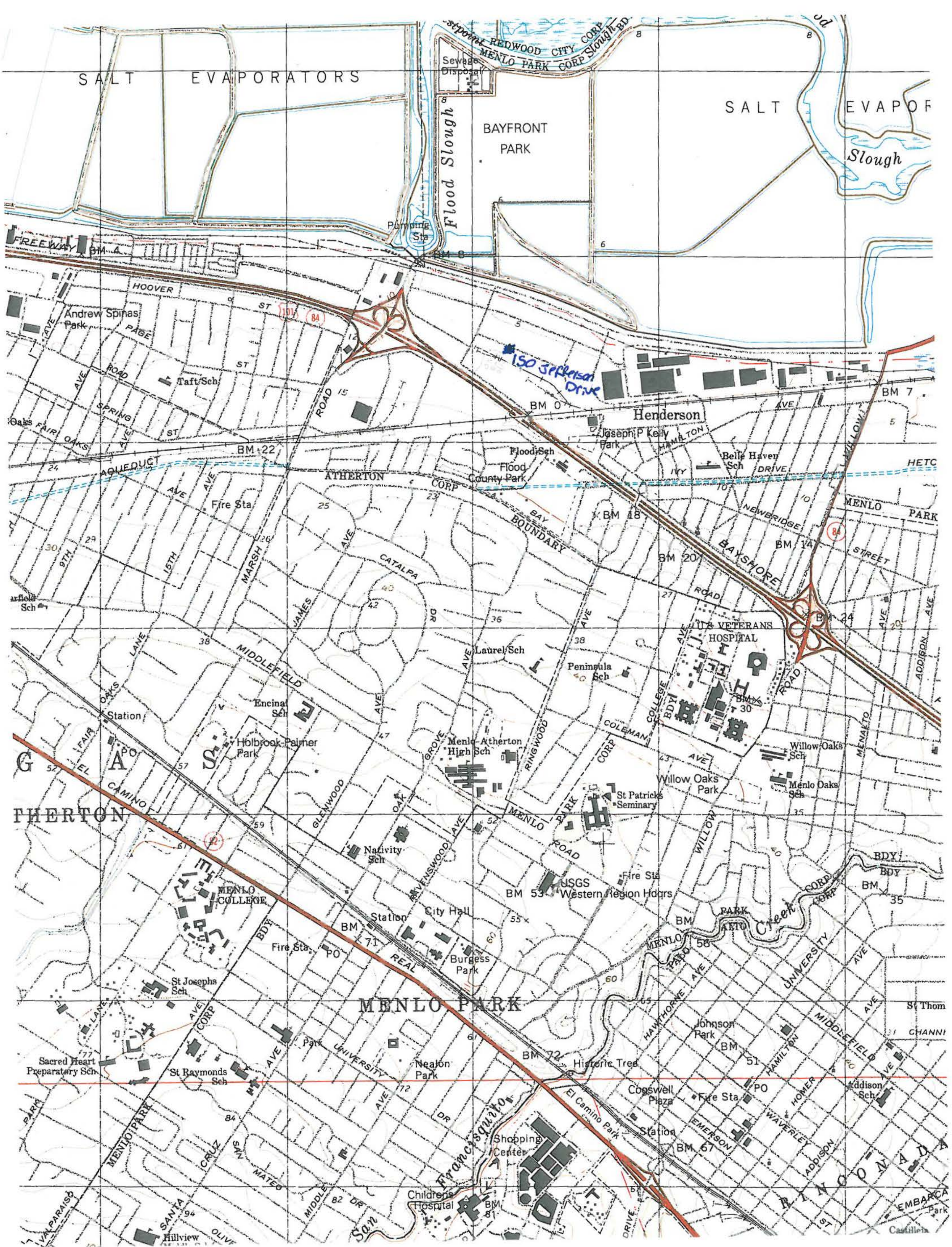
This letter is to request a review of the project area to determine whether there are any known cultural resources in or near the project area, any surveys have been performed of the project site and vicinity, and assess the site's sensitivity for as-yet undiscovered cultural resources. We would like to have the Northwest Information Center (NWIC) perform a non-confidential records search for the project area, and have attached the relevant US Geologic Survey (USGS) Quadrangle (Palo Alto), a regional location map and an aerial map showing the project area outlined in red.

MIG|TRA hereby authorizes up to four hours at the NWIC regular rate of $150 per hour. Please contact me at (510) 379-8409 if you have any questions.

Thank you,

Megan Kalyankar
Environmental Analyst

545 Middlefield Road, Suite 200 • Menlo Park, CA 94025 • 650-327-0429 • www.migcom.com • www.traenviro.com
Offices in California • Colorado • New York • North Carolina • Oregon • Texas



SALT EVAPORATORS
REDWOOD CITY CORP
MENLO PARK CORP
Sewage Disposal
Flood Slough
BAYFRONT PARK
SALT EVAPOR
Slough
Pumping Sta
FREEWAY
BM 4
BM 8
HOOVER
ST
Andrew Spinas Park
PAGE
Taft Sch
SPRING
FAIR OAKS
BM 22
AQUEDUCT
ROAD
150 Jefferson Drive
BM 0
Henderson
Joseph P Kelly Park
HAMILTON
Flood Sch
Flood County Park
Belle Haven Sch
IVY
DRIVE
WILLOW
HETC
ATHERTON
CORP
BAY
BOUNDARY
BM 18
NEWBRIDGE
MENLO PARK
BM 20
BAYSHORE
BM 14
STREET
Fire Sta
9TH
15TH
MARSH
JAMES
CATALPA
DR
Sch
US VETERANS HOSPITAL
BM 24
ADDISON
MIDDLEFIELD
Laurel Sch
Peninsula Sch
COLLEGE
BDY
COLEMAN
BM 30
MENALTO
Station
Encinal Sch
Holbrook-Palmer Park
Menlo-Atherton High Sch
GROVE
RINGWOOD
Willow Oaks Sch
Willow Oaks Park
Menlo Oaks Sch
St Patricks Seminary
THERTON
EL CAMINO
GLENWOOD
OAK
RAVENSWOOD
MENLO
ROAD
Nativity Sch
USGS Western Region Hdqrs
Fire Sta
BM 53
BM 35
Creek
MENLO COLLEGE
City Hall
PALO ALTO
BM 56
UNIVERSITY
Fire Sta
PO
BM 71
REAL
Burgess Park
St Josephs Sch
MENLO PARK
HAWTHORNE
Johnson Park
St Thom
CHANNI
Sacred Heart Preparatory Sch
St Raymonds Sch
Nealon Park
BM 72
Historic Tree
BM 51
HOMER
Addison Sch
Cogswell Plaza
El Camino Park
Station
EMERSON
WAVERLEY
BM 67
SANTA CRUZ
SAN MATEO
MIDDLE
San Francisquito
Shopping Center
Childrens Hospital
BM 81
RINCONADA
EMBARCA
VALPARAISO
Hillview
OLIVE

Source: ESRI 2015; MIG | TRA 2015

★ Project location

☐ County boundary

— Major road

Figure 1 Regional Location

150 Jefferson Drive School Project

Source: ESRI 2015; MIG|TRA 2015

Project boundary

City boundary

MIG TRA ENVIRONMENTAL SCIENCES

Figure 2 Site Vicinity

150 Jefferson Drive School Project

CALIFORNIA
HISTORICAL
RESOURCES
INFORMATION
SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
DEL NORTE
HUMBOLDT
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLARA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
150 Professional Center Drive, Suite E
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Tel: 707.588.8455
nwic@sonoma.edu
http://www.sonoma.edu/nwic

March 17, 2015

NWIC File No.: 14-1215

Megan Kalyankar
TRA Environmental Sciences
545 Middlefield Road, Suite 200
Menlo Park, CA 94025

RECEIVED
MAR 25 2015
MIG | TRA

Re: Record search results for the proposed Sequoia Union High School District (SUHSD) 150 Jefferson Drive High School Project.

Dear Ms. Kalyankar:

Per your request received by our office on March 16, 2015, a records search was conducted for the above referenced project by reviewing pertinent Northwest Information Center (NWIC) base maps that reference cultural resources records and reports, historic-period maps, and literature for San Mateo County. Please note that use of the term cultural resources includes both archaeological resources and historical buildings and/or structures.

Review of this information indicates that there have been no cultural resource studies that cover any of the proposed SUHSD 150 Jefferson Drive High School project area. This project area contains no recorded archaeological resources. The State Office of Historic Preservation Historic Property Directory (OHP HPD) (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) lists no recorded buildings or structures adjacent to the proposed SUHSD 150 Jefferson Drive High School project area. In addition to these inventories, the NWIC base maps show no recorded buildings or structures within the proposed SUHSD 150 Jefferson Drive High School project area.

At the time of Euroamerican contact, the Native Americans that lived in the area, the *Lamchin Ohlone*, were speakers of the *Ramaytush* language, which is a part of the Costanoan language family (Levy 1978: 485; Milliken 1995: 4). There are no Native American resources in or adjacent to the proposed project area referenced in the ethnographic literature (Kroeber 1925: 462-468; Levy 1978: 485; Nelson 1964).

Based on an evaluation of the environmental setting and features associated with known sites, Native American resources in this part of San Mateo County have been found along the major waterways of the region, in close proximity to the bay margins of the San Francisco Bay, and other productive environments. The proposed SUHSD 150 Jefferson Drive High School project area is located in close proximity to the historical margins of the San Francisco Bay, which contains Holocene alluvial deposits. The topography of the general area has a gentle slope. Additionally, there was historically an unnamed drainage located near the project area, which flowed into the bay prior to its channelization. These factors increase the potential for buried archaeological deposits that may show no evidence on the surface. Given the similarity of one or more of these environmental factors, there is a moderate potential of identifying unrecorded Native American resources in the proposed SUHSD 150 Jefferson Drive High School project area.

Review of historical literature and maps gave no indication of the possibility of historic-period archaeological resources within the proposed SUHSD 150 Jefferson Drive High School project area. With this in mind, there is a low potential of identifying unrecorded historic-period archaeological resources in the proposed SUHSD 150 Jefferson Drive High School project area.

The 1899, 1941, 1948, and 1961 Palo Alto USGS 15-minute topographic quadrangles fail to depict any buildings or structures within the proposed SUHSD 150 Jefferson Drive High School project area; therefore, there is a low possibility of identifying any buildings or structures 45 years or older within the project area.

RECOMMENDATIONS:

1) Given the environmental setting of the proposed project, there is a moderate potential of identifying buried Native American archaeological resources and a low potential of identifying buried historic-period archaeological resources in the project area. Depending on the vertical extent of previous ground disturbance from prior projects, coupled with the potential impacts from the proposed SUHSD 150 Jefferson Drive High School Project, we recommend a qualified archaeologist conduct further archival and field study to identify cultural resources. Field study may include, but is not limited to, hand auger sampling, shovel test units, or geoarchaeological analyses as well as other common methods used to identify the presence of archaeological resources. Please refer to the list of consultants who meet the Secretary of Interior's Standards at http://www.chrisinfo.org.

2) We recommend you contact the local Native American tribes regarding traditional, cultural, and religious heritage values. For a complete listing of tribes in the vicinity of the project, please contact the Native American Heritage Commission at (916) 373-3710.

3) If the proposed project area contains buildings or structures that meet the minimum age requirement, prior to commencement of project activities, it is recommended that this resource be assessed by a professional familiar with the architecture and history of San Mateo County. Please refer to the list of consultants who meet the Secretary of Interior's Standards at http://www.chrisinfo.org.

4) Review for possible historic-period buildings or structures has included only those

sources listed in the attached bibliography and should not be considered comprehensive.

5) If archaeological resources are encountered **during construction,** work should be temporarily halted in the vicinity of the discovered materials and workers should avoid altering the materials and their context until a qualified professional archaeologist has evaluated the situation and provided appropriate recommendations. Project personnel should not collect cultural resources. Native American resources include chert or obsidian flakes, projectile points, mortars, and pestles; and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. Historic-period resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits or bottle dumps, often located in old wells or privies.

6) It is recommended that any identified cultural resources be recorded on DPR 523 historic resource recordation forms, available online from the Office of Historic Preservation's website: http://ohp.parks.ca.gov/default.asp?page_id=1069

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the California Historical Resources Information System (CHRIS) Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

Thank you for using our services. Please contact this office if you have any questions, (707) 588-8455.

Sincerely,

Mark Castro

Mark Castro
Researcher

LITERATURE REVIEWED

In addition to archaeological maps and site records on file at the Northwest Information Center of the Historical Resources Information System, the following literature was reviewed:

Bowman, J.N.
1951 *Adobe Houses in the San Francisco Bay Region*. In Geologic Guidebook of the San Francisco Bay Counties, Bulletin 154. California Division of Mines, Ferry Building, San Francisco, CA.

Fickewirth, Alvin A.
1992 *California Railroads*. Golden West Books, San Marino, CA.

General Land Office
1856 Survey Plat for Rancho de Las Pulgas.

Gudde, Erwin G.
1969 *California Place Names: The Origin and Etymology of Current Geographical Names.* Third Edition. University of California Press, Berkeley and Los Angeles.

Helley, E.J., K.R. Lajoie, W.E. Spangle, and M.L. Blair
1979 *Flatland Deposits of the San Francisco Bay Region - Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning.* Geological Survey Professional Paper 943. United States Geological Survey and Department of Housing and Urban Development.

Hoover, Mildred Brooke, Hero Eugene Rensch, and Ethel Rensch, revised by William N. Abeloe
1966 *Historic Spots in California.* Third Edition. Stanford University Press, Stanford, CA.

Hoover, Mildred Brooke, Hero Eugene Rensch, and Ethel Rensch, William N. Abeloe, revised by Douglas E. Kyle
1990 *Historic Spots in California.* Fourth Edition. Stanford University Press, Stanford, CA.

Hope, Andrew
2005 *Caltrans Statewide Historic Bridge Inventory Update*. Caltrans, Division of Environmental Analysis, Sacramento, CA.

Kroeber, A.L.
1925 *Handbook of the Indians of California.* Bureau of American Ethnology, Bulletin 78, Smithsonian Institution, Washington, D.C. (Reprint by Dover Publications, Inc., New York, 1976)

Levy, Richard
1978 Costanoan. In *California*, edited by Robert F. Heizer, pp. 485-495. Handbook of North American Indians, vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Milliken, Randall
1995 *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area 1769-1810*. Ballena Press Anthropological Papers No. 43, Menlo Park, CA.

Nelson, N.C.
1909 *Shellmounds of the San Francisco Bay Region*. University of California Publications in American Archaeology and Ethnology 7(4):309-356. Berkeley. (Reprint by Kraus Reprint Corporation, New York, 1964)

Nichols, Donald R., and Nancy A. Wright
1971 Preliminary Map of Historic Margins of Marshland, San Francisco Bay, California. U.S. Geological Survey Open File Map. U.S. Department of the Interior, Geological Survey in cooperation with the U.S. Department of Housing and Urban Development, Washington, D.C.

San Mateo County Historic Resources Advisory Board
1984 *San Mateo County: Its History and Heritage*. Second Edition. Division of Planning and Development Department of Environmental Management.

San Mateo County Planning and Development Department
n.d. "Historical and Archaeological Resources, Section 5" from the *San Mateo County General Plan*.

State of California Department of Parks and Recreation
1976 *California Inventory of Historic Resources*. State of California Department of Parks and Recreation, Sacramento.

State of California Department of Parks and Recreation and Office of Historic Preservation
1988 *Five Views: An Ethnic Sites Survey for California*. State of California Department of Parks and Recreation and Office of Historic Preservation, Sacramento.

State of California Office of Historic Preservation **
2012 *Historic Properties Directory*. Listing by City (through April 2012). State of California Office of Historic Preservation, Sacramento.

**Note that the Office of Historic Preservation's *Historic Properties Directory* includes National Register, State Registered Landmarks, California Points of Historical Interest, and the California Register of Historical Resources as well as Certified Local Government surveys that have undergone Section 106 review.

CALIFORNIA
HISTORICAL
RESOURCES
INFORMATION
SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
DEL NORTE
HUMBOLDT
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLATA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
150 Professional Center Drive, Suite E
Rohnert Park, California 94928-3609
Tel: 707.588.8455
nwic@sonoma.edu
http://www.sonoma.edu/nwic

ACCESS AGREEMENT SHORT FORM

File Number: 14-1215

I, the the undersigned, have been granted access to historical resources information on file at the Northwest Information Center of the Califronia Historical Resources Information System.

I understand that any CHRIS Confidential Information I receive shall not be disclosed to individuals who do not qualify for access to such information, as specified in Section III(A-E) of the CHRIS Information Center Rules of Operation Manual, or in publicly distributed documents without written consent of the Information Center Coordinator.

I agree to submit historical Resource Records and Reports based in part on the CHRIS information released under this Access Agreement to the Information Center within sixty (60) calendar days of completion.

I agree to pay for CHRIS services provided under this Access Agreement within sixty (60) calendar days of receipt of billing.

I understand that failure to comply with this Access Agreement shall be grounds for denial of access to CHRIS Information.

Print Name: Megan Kalyankar   Date: 3/17/2015
Signature:
Affiliation TRA Environmental Sciences, Inc.
Address: 545 Middlefield Road Suite 200   City/State/ZIP: Menlo Park, CA 94025
Billing Address (if different from above):
Special Billing Information
Telephone: (510) 379-8409   Email:
Purpose of Access: Project Planning
Reference (project name or number, title of study, and street address if applicable):
SUHSD 150 Jefferson Drive High School Project
County: SCL   USGS 7.5' Quad: Palo Alto

Sonoma State University Customer ID: 1001439
Sonoma Sate University Invoice No.:
Total Cost: 300

This is not an invoice. Sonoma Sate University will send separate Invoice

MIG | TRA ENVIRONMENTAL SCIENCES

Febuary 4, 2016
Ms. Debbie Pilas-Treadway
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814

Dear Ms. Pilas-Treadway

MIG | TRA has been retained for the 150 Jefferson Drive School project. The project is located in San Mateo County. The project is depicted on the attached United States Geological Survey (USGS) quadrangle map.

Quadrangle	Township	Range	Section
Woodside	T.5.S	R.3.W	

The UTM for the approximate centre of the site is: 10S 573043mE 4148691mN

Please conduct a search of the Sacred Lands Inventory for any known Native American culturally significant and/or Sacred Sites. Additionally please forward a list of Native American tribes associated with this area.

Thank you for your help and time,

Respectfully,

B Templar

Robert Templar,
Project Archaeologist
MIG | TRA Environmental Sciences, Inc.
2635 North First Street, Ste. 149
San Jose, CA 95134
650-327-0429 ext. 554
rtemplar@migcom.com

Source: ESRI 2015; MIG | TRA 2015

Approximate area of project exent

0.5 mile buffer around project extent

Site location and 0.5 mile buffer

USGS 7.5 minute topographic basemap: Palo Alto Quadrangle

T.5.S R.3.W

UTM: 10S 573043mE 4148691mN

MIG | TRA ENVIRONMENTAL SCIENCES

150 Jefferson Drive Small School Project NOP

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 FAX

February 17, 2016

Robert Templar
MIG| TRA

Sent by Email: rtemplar@migcom.com
Number of Pages: 3

RE: 150 Jefferson Drive School Project, San Mateo County

Dear Mr. Templar:

Attached is a consultation list of tribes with traditional lands or cultural places located within the boundaries of the above referenced counties. Please note that the intent above reference codes is to mitigate impacts to tribal cultural resources, as defined, for California Environmental Quality Act (CEQA) projects.

As of July 1, 2015, Public Resources Code Sections 21080.1, 21080.3.1 and 21080.3.2 require public agencies to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose mitigating impacts to tribal cultural resources:

> Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. (Public Resources Code Section 21080.1(d))

The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC believes that agencies should also include with their notification letters information regarding any cultural resources assessment that has been completed on the APE, such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

    - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
    - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
    - If the probability is low, moderate, or high that cultural resources are located in the APE.
    - Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE; and

- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measurers.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure in accordance with Government Code Section 6254.10.

3. The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission. **A search of the SFL was completed for the USGS quadrangle information provided with negative results.**

4. Any ethnographic studies conducted for any area including all or part of the potential APE; and

5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the case that they do, having the information beforehand well help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: sharaya.souza@nahc.ca.gov

Sincerely,

Sharaya Souza

Sharaya Souza
Staff Services Analyst

Native American Heritage Commission
Tribal Consultation List
San Mateo County
February 17, 2016

Coastanoan Rumsen Carmel Tribe
Tony Cerda, Chairperson
[redacted] Ohlone/Costanoan

Amah MutsunTribal Band of Mission San Juan Bautista
Irenne Zwierlein, Chairperson
[redacted] Ohlone/Costanoan

Muwekma Ohlone Indian Tribe of the SF Bay Area
Rosemary Cambra, Chairperson
[redacted] Ohlone / Costanoan

The Ohlone Indian Tribe
Andrew Galvan
[redacted] Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
[redacted] Ohlone/Costanoan

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed 150 Jefferson Drive School Project, San Mateo County.

February 18, 2016

Sample Letter

Muwekma Ohlone Indian Tribe of the SF Bay Area
Rosemary Cambra, Chairperson
[redacted]

Subject: The proposed high school project at the **Menlo Park Small High School** located at 150 Jefferson Drive in the City of Menlo Park, San Mateo County, California

Dear Ms. Cambra:
The proposed project includes replacement of the existing industrial unit on the site at 150 Jefferson Drive and construction of a small high school. The construction would include: a three story high school for 400 students, new parking lot, outdoor learning amphitheater. The project would also remove (demolish) the existing cable assembly business building; while replacing the existing landscaping, with new landscaping.

The project occupies portions of Unsectioned Township 5 South, Range 3 West. The project location is depicted on USGS Palo Alto 7.5 Minute Quadrangles 1991 (Attachment 1).
On February 17, 2016, the NAHC's Sacred Lands File Search was completed and failed to indicate Native American cultural resources within the proposed Area of Potential Effect (APE) and Study Area. The NAHC recommended that you be contacted.

If you know of any Native American cultural concerns with this project, please do not hesitate to contact me by telephone at (650) 327-0429 x554, or by email at rtemplar@migcom.com. If you are not the designated representative, please forward this information to the responsible person. Thank you for your assistance in this matter. I look forward to hearing from you.
Sincerely,

Robert Templar, M.A.
Archaeologist

Attachment: USGS 7.5 Minute Quadrangle

APPENDIX F2:

DEPARTMENT OF PARKS AND RECREATION: PRIMARY HISTORIC RECORD FORM

State of California The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 6Z

Other Listings
Review Code Reviewer Date

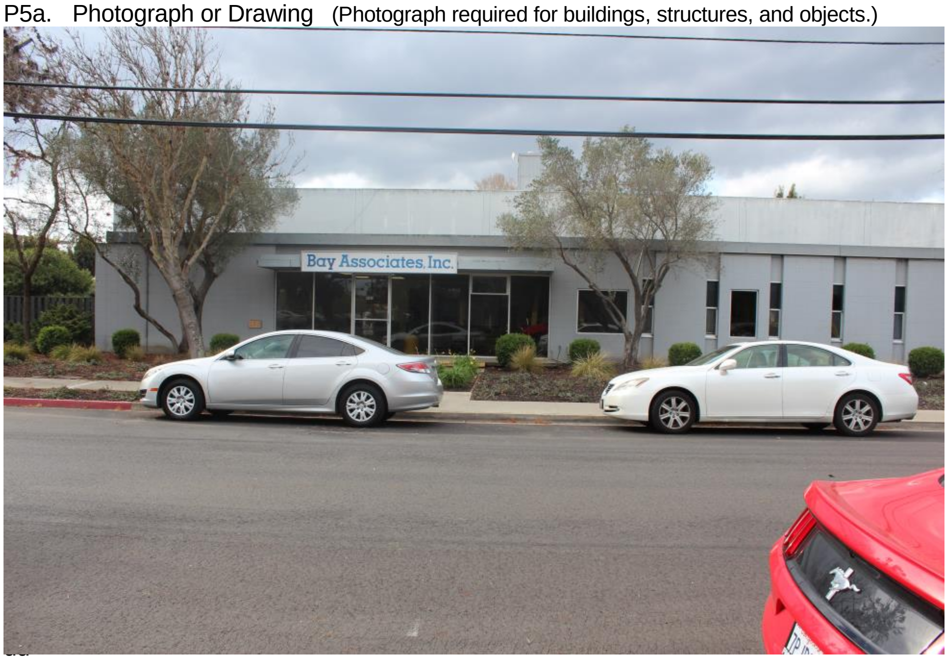
Page 1 **of** 7 ***Resource Name or #:** (Assigned by recorder) JHS001H
P1. Other Identifier:

***P2. Location:** **Not for Publication** X **Unrestricted**
***a. County** San Mateo **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Palo Alto **Date** 1961 (photo. 1973) **T** 5S ; **R** 3W; ☐ **of** ☐ **of Sec** Mt Diablo; **B.M.**
c. Address 150 Jefferson Drive City Menlo Park Zip 94025
d. UTM: (Give more than one for large and/or linear resources) Zone 10 , 573045 mE/ 414863 mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate): APN 055-243-030

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
A. Property type: commercial, building **B. Setting:** in industrial business park; 1 building on site; site contains some landscaping and a blacktop parking lot **C. Architectural style:** mid-century modern **D. General characteristics:** façade faces north, one-story warehouse/office building, concrete construction, flat roof **E. Specific features:** glass curtain wall entrance, plaster decorative panels, obscured glass windows, truck loading garage doors on east and south sides **F. Decorative element:** none **G. Alterations:** addition to west side of building **H. Integrity level:** some loss of integrity **I. Retains integrity:** location, setting, associate, and feeling.

***P3b. Resource Attributes:** (List attributes and codes) HP6, 1-3 story commercial building
***P4. Resources Present:** X Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)



P5b. Description of Photo: (view, date, accession #)

***P6. Date Constructed/Age and Source:** X Historic ☐ Prehistoric ☐ Both
1963

***P7. Owner and Address:**
Sequioa Union High School District
400 James Avenue
Redwood City, CA 94062

***P8. Recorded by:** (Name, affiliation, and address) JulieAnn Murphy, MIG,Inc. 800 Hearst Ave., Berkeley, CA 94710

***P9. Date Recorded:** 2/17/2016

***P10. Survey Type:** (Describe)
Reconnaissance survey

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.")
MIG, Inc. Historic Resource Evaluation for 150 Jefferson Drive, Menlo Park. Prepared for the Sequoia Union High School District

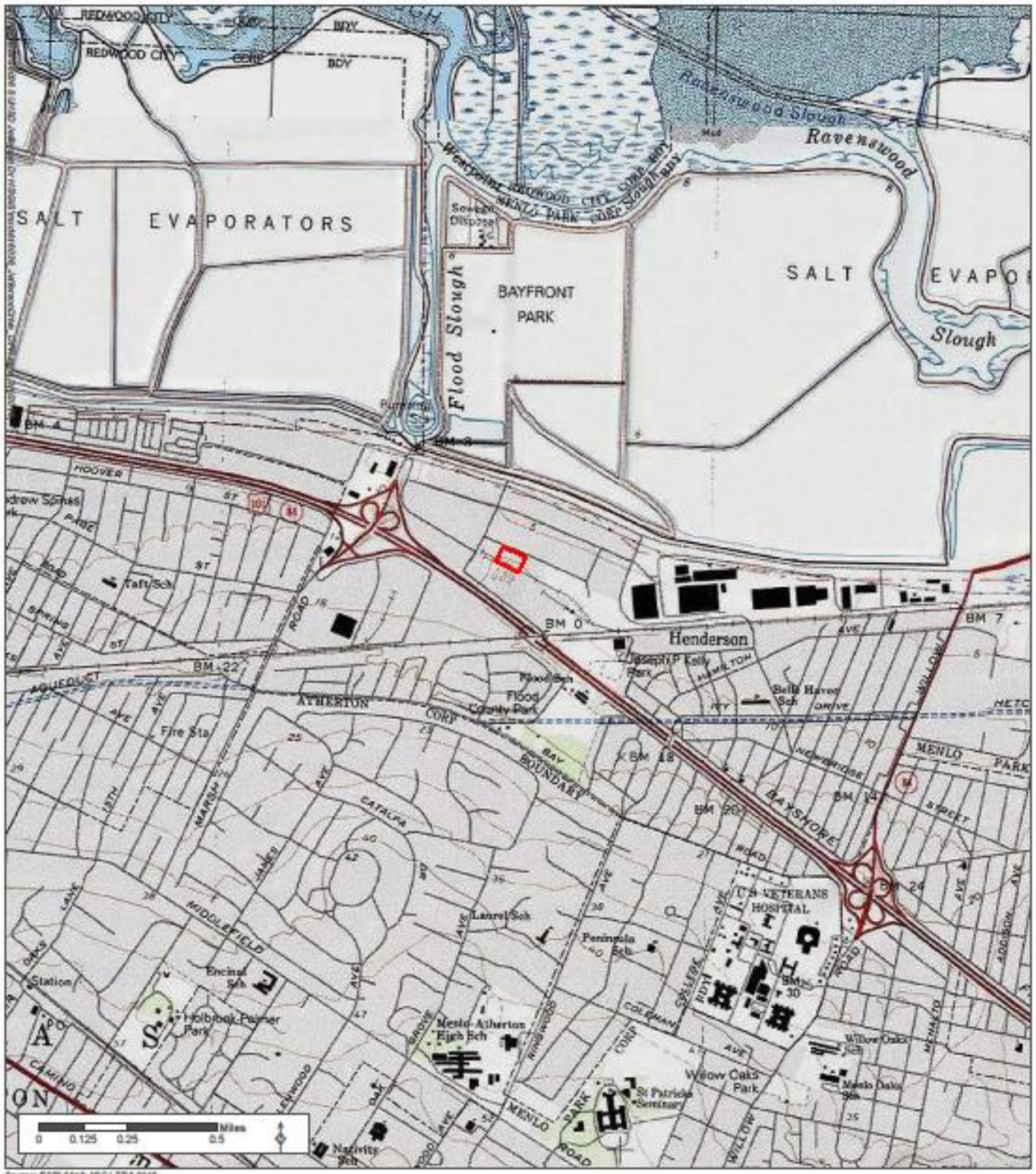
***Attachments:** ☐NONE × Location Map × Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

Page 2 **of** 7 ***Resource Name or #:** JHS001H

***Map Name:** USGS Palo Alto Quadrangle ***Scale: 1:24,000** ***Date of Map:** 2015 (electronic)



Project Boundary

Project Location
USGS 7.5 minute topographic basemep: Palo Alto Quadrangle
Unsectioned T.5.S, R.3.W
Scale: 1: 24,000
UTM: 10S 573043mE 4148691mN
150 Jefferson Drive School Project

State of California The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** (Assigned by recorder) JHS001H ***NRHP Status** 6Z
Code Page 3 of 7

B1. Historic Name: None
B2. Common Name: None
B3. Original Use: Office/warehouse B4. Present Use: Office/warehouse
***B5. Architectural Style:** Mid-century modern
***B6. Construction History:** (Construction date, alterations, and date of alterations)
The office/warehouse was built in 1963 according to the Accessor's records. An office/warehouse addition was built in 1970. A permit was issued in 1970 to add a HVAC system. There were updated to the electrical system in 1998.

***B7. Moved?** X **No** ☐**Yes** ☐**Unknown Date:** ______ **Original Location:** ______
***B8. Related Features:**

B9a. Architect: Charles Luckman Associates(1963)Cabak Associates (1970 addition
b. Builder: Unknown
***B10. Significance: Theme** Commercial Development/Post War Development **Area** Menlo Park
Period of Significance 1963-1970 **Property Type** Commercial **Applicable Criteria** NA
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)
150 Jefferson Drive is located on an approximately 375'x 250' rectangular parcel between Chrysler Drive and Chilco Street (Figure 2). Constructed in 1963, 150 Jefferson Drive is a one-story commercial warehouse building. 150 Jefferson Drive was developed as part of the Bohannon Industrial Park, an early example of the industrial park as a new type of development that emerged along with suburban growth. As such, the surrounding buildings are typical of those in an industrial/ office park consisting of mid-rise office buildings and commercial warehouses.
(see Continuation Sheet)

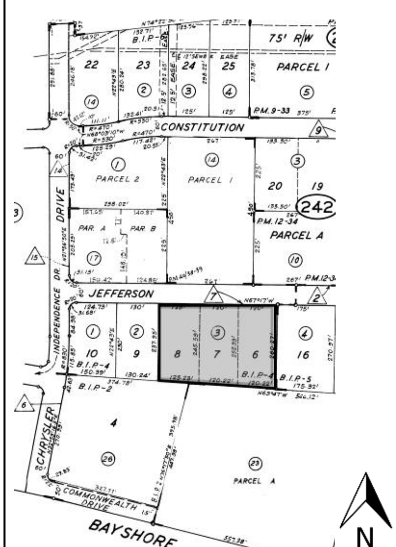
B11. Additional Resource Attributes: (List attributes and codes) ______
***B12. References:**
San Mateo County Accessor's, 055-243-030, San Mateo County Recorder's Office.San Mateo County Planning and Building Department parcel map, 055-243-030 Menlo Park Planning and Building Division plans for 150 Jefferson Drive, Menlo Park City Hall.

B13. Remarks:
The building retains some of its integrity. It had a sizeable addition added. It fails to qualify for the National Register of Historic Places and the California Register of Historical Resources.

***B14. Evaluator:** JulieAnn Murphy
***Date of Evaluation:** 2/17/16

(This space reserved for official comments.)

Sketch Map, San Mateo County Accessor's



B10 SIGNIFICANCE (continued)

Menlo Park was initially home to the Ohlone Native Americans. Spanish rule was introduced in 1769 when Don Gaspar de Portola camped near "El Palo Alto" after the discovery of the San Francisco Bay. The colonizing of the peninsula began soon after following the expedition of Juan Bautista DeAnza and the establishment of Mission Delores and the Presidio of San Francisco in 1766.

In 1853, Don Jose Dario Arguello legally obtained the title to the land where 150 Jefferson sits today. In 1854, Dennis Oliver and Daniel McGlynn purchased 1,700 acres from Arguello and the town of Menlo Park began to grow with the introduction of the Southern Pacific Railroad. For generations, the land where 150 Jefferson sits today was undeveloped, referred to as Sweeny Oaks, it served mostly as agricultural land. Menlo Park remained a small town until World War II. Between 1943-1946 the Dibble General Hospital was built to care for injured soldiers, contributing to an increased population. Following World War II, the hospital campus became the site of the Menlo Park Civic Center, Stanford Research Institute, and the United States Geological Survey. Much like the rest of the United States, postwar development boomed along the Peninsula, including in Menlo Park. Residential communities were growing at a rate never before seen. With the increased pace of residential development, came a new planning design – the industrial park.

David Bohannon purchased a 200-acre site in Menlo Park in 1954 and called it the Bohannon Industrial Park. A new planning design concept, he envisioned the industrial park to be a complex of office and industrial buildings. The industrial park as a planning design was a new idea responding to suburban growth. It allowed people to not have to commute to the city, provided ample parking space, and also allowed companies to avoid having to build their own headquarters.

The lot at 150 Jefferson Drive was subdivided in 1963. It is the same year that the original building was built for Bucal Inc., a hospital supply company. The office/warehouse building was designed by Charles Luckman Associates, a Los Angeles Based firm headed by famed architect Charles Luckman. In 1970, an addition was made to the warehouse and office space. The addition was designed by Cabak Associates, a local firm based in Menlo Park. The addition did not alter the original design in a significant. It was a seamless continuation of the original building, following the original scale and using the same materials. The site has remained largely unchanged since 1970.

ARCHITECTURAL STYLE
150 Jefferson Drive possesses many of the elements of the International Style of mid-century modern architecture. International Style modernism is defined by rectilinear forms, plane surfaces devoid of applied ornamentation, and open, fluid spaces. The minimalism of the style is reinforced by the use of modern materials, including glass for the façade, steel for support, and concrete for interior supports and floors.

Though 150 Jefferson Drive is a simple building, it is drawing on the principles of the International Style. The entrance is a curtain glass façade. Charles Luckman was known for his adherence to the functionalist ideals of modernist design. As such, the overall structure is extremely simple in form, characterized by straight lines and little ornament. The ornament that does exist, the plaster panels on the northeast side of the façade, only further the modernist expression. The rhythm of the panels and the windows is regular, slight and reinforces the use of clean lines. Furthermore, the use of concrete as the main material is also typical of a modernist building drawing from the International Style.

Charles Luckman Associates

Charles Luckman was a dynamic figure in the United States following the Great Depression. Born in 1909, Luckman proved to be a savvy businessman at a young age. He became the president of Pepsodent by age 30, where his marketing techniques were recognized as quadrupling business profits. In 1946, after Pepsodent was acquired by Lever Brothers, he became Lever's president.

He was the President of the company when it commissioned the construction of Lever House in New York in 1952 by Skidmore, Owings and Merrill. One of the first glass skyscrapers in New York, Lever House is regarded as one of the most important modernist buildings in the United States. Luckman, who graduated with a BA in Architecture from University of Illinois was Ignited by the modernist architecture movement and the success of the Lever House design. As a result, he decided to leave his corporate job and return to pursuing architecture.

Luckman formed a partnership with Los Angeles based architect William Pereria. Together they specialized in commercial architecture, airports and Air Force Bases. Their partnership ended in 1959. The formation of Charles Luckman and Associates followed. During this period, Luckman designed Madison Square Garden (1968), the structure that replaced New York's original Penn Station. The demolition of Penn Station kindled the early historic preservation movement in the United States. As such, many were critical of his design for the new building. Other notable works by Luckman include: Johnson Space Center in Houston (1962) the Prudential Center in Boston (1964), Forum in Los Angeles (1967), and Broadway Plaza in Los Angeles (1973).[i] He sold his architecture firm in 1968 to Ogden Corporation and became president of its subsidiary, a real estate development firm, Ogden Development.

Charles Luckman had a rather distinguished public profile. He was director of the Freedom Train, part of President Truman's program for rebuilding Europe after World War II. He was also on the board of councilors of Brain Research Institute at UCLA and president of the Los Angeles Ballet. He was connected to the Bay Area through his seat on the California State University Board of Trustees at California State University, San Jose. He passed away at the age of 89 in 1999.

Cabak Associates

Caback Associates was founded in 1969, one year before the firm designed the addition to the original 1963 building. They were a local architectural and engineering firm. There does not seem to be any significant buildings in their portfolio. The firm closed in 1979.

Criterion A/1 – Event

150 Jefferson Drive does not appear to be individually eligible for listing on the National Register under Criterion A or the California Register under Criterion 1 for association with events that have made a significant contribution to the broad

patterns of local, state or national history. The property was constructed during a time increased development in this area of Menlo Park. As part of Bohannon Industrial Park, it was one of many buildings being constructed around the same time. Together, the subdivision and development of several commercial and warehouse spaces as part of the new development concept, the suburban industrial/office park as part of Bohannon Industrial Park does illustrate a change in urban planning practices. 150 Jefferson Drive, however, does not individually represent this context. It is as associated with this new pattern of development as other industrial/office parks during this time. In sum, 150 Jefferson Drive does not make a significant contribution to social, political and economic trends that were occurring to urban planning during the 1960s such that it would be individually eligible for listing on the National Register or California Register.

Criterion B/2 – Person

150 Jefferson Drive does not appear to be individually eligible for listing on the National Register under Criterion B or the California Register 2 for resources that are associated with the lives of persons significant in history. Though Charles Luckman Associates did design the building, there is no evidence that Charles Luckman himself was involved in the design, details or construction of this project. Furthermore, given Luckman's portfolio of work described above, this building does not stand out in association with Luckman as one of his most distinguishable works.

Criterion C/3 – Design/Construction

150 Jefferson Drive does not appear to be individually listed on the National Register under Criterion C or the California Register under Criterion 3. The design of 150 Jefferson Drive follows the popular ideas in architecture of the time. It also does not appear to be significant for its use of International Style and modernist era vocabulary. This building does not embody *distinctive* characteristics of a particular type, period or method of construction. The site plan and building design follow ideas of commercial/warehouse construction of the 1960s, but it does not rise to the level of individual significance for this reason that would make it eligible for listing on the National Register or California Register.

Criterion D/4 – Information Potential

Criterion D/4 is typically related to archeological resources rather than built resources. When Criterion D/4 does relate to built resources, it is for cases when the building itself is the principal sources of important construction-related information. Based on historic research, this criterion is not applicable to 150 Jefferson Drive.

State of California Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary#
HRI #
Trinomial

CONTINUATION SHEET

***Resource Name or # JHS001H** (Assigned by recorder)

***Recorded by:** JulieAnn Murphy ***Date** 2/17/16 x Continuation Update

Photo 1: North main entrance from Jefferson Drive, looking south

Photo 2: South façade looking northwest.

Photo 3: North façade from Jefferson Drive, looking south.

Photo 4: South façade with temporary awning structure, chain-link enclosure and loading door, looking northwest.

Photo 5: East façade showing loading garages and covered patio area, looking southwest

Photo 6: West façade with two exterior doors.

APPENDIX F3:

MIG|TRA HISTORIC EVALUATION

INTRODUCTION

This Historic Evaluation has been prepared at the request of Sequoia Union High School District for 150 Jefferson Drive (APN 055243030) in the City of Menlo Park (Figure 1). 150 Jefferson Drive was designed by Charles Luckman Associates. The building was constructed in 1963 as part of the Bohannon Industrial Park. There was an addition to the building in 1970 that was designed by Cabak Associates.

SUMMARY OF DETERMINATION

150 Jefferson Drive has not been previously evaluated for the National Register of Historic Places (National Register) of the California Register of Historic Places (California Register). The building does not appear eligible for listing on the National Register or the California Register. The building also fails to meet criteria to be included in a Historic Site District Zone. The City of Menlo Park maintains no local register of historic resources. This building is not considered a resource for the purposes of review under CEQA.

METHODOLOGY

This report follows a standard outline for Historic Resource Evaluation Reports, and provides a building description, historic context statement, and examination of the current historic status for 150 Jefferson Drive. This report also includes an evaluation of the property's eligibility for listing on the National Register of Historic Places and the California Register of Historic Resources.

MIG, Inc. prepared this report using research collected at various local repositories, including Menlo Park Historical Association, San Mateo County Assessor's Office, and the Menlo Park Planning and Building Division as well as several Internet sources.

CURRENT HISTORIC STATUS

The following section examines the national, state and local historical ratings currently assigned to the building at 150 Jefferson Drive.

National Register of Historic Places

The National Register of Historic Places (National Register) is the United States' most comprehensive inventory of historic resources. The National Register is administered by the National Park Service and includes buildings, sites, structures, objects, and districts that represent historic, architectural, engineering, architectural, engineering, archeological or cultural significance at the national, state or local level.

150 Jefferson Drive is not listed on the National Register of Historic Places.

California Register of Historical Resources

The California Register of Historical Resources (California Register) is an inventory of significant architectural, archeological, and historical resources in the State of California. Resources can be listed on the California Register through a number of methods. State Historical Landmarks and National Register listed properties are automatically listed on the California Register. Properties can also be nominated to the California Register by local governments, private organizations, or citizens. The evaluative criteria used by the California Register for determining eligibility are closely based on those developed by the National Park Service for the National Register.

150 Jefferson Drive is not listed on the California Register of Historic Resources.

Local Designation

Section 16.54 of the City of Menlo Park Zoning Ordinance provides for an Historic Site District (H) for the "protection, enhancement, perpetuation and use of structures, sites and areas that are reminders of people, events or eras, or which provide significant examples of architectural styles and the physical surroundings in which past generations lived." The ordinance allows the City Council to designate historic resources or sites. However, the City of Menlo Park maintains no local register of historic resources.

California Historical Resource Status Code

Properties listed or under review by the State of California Office of Historic Preservation are assigned a California Resource State Code (Status Code) of 1-7 to establish their historical significance in relations to the National Register or California Register. Properties with a Status Code of 1 or 2 are either eligible for listing on the National Register or California Register or are already listed on one or both of the registers. Properties assigned a Status Code of 3 or 4 appear to be eligible for listing in either register, but need more research to support this rating. Properties assigned a Status Code of 5 have typically been determined to be locally significant or to have contextual importance. Properties with a Status Code of 6 are not eligible for listing in either register. A Status Code of 7 indicates the resource has not been evaluated for the National Register or California Register, or needs evaluation.

150 Jefferson Drive is not listed in the California Historic Resources Information System (CHRIS) database with any Status Code, which means that the building has not been formally evaluated using the California Historical Resource Status Code. The site was evaluated by JulieAnn Murphy from MIG, Inc. on February 16, 2016 and found not to be eligible for listing.

ARCHITECTURAL DESCRIPTION

SITE

150 Jefferson Drive is located on an approximately 375'x 250' rectangular parcel between Chrysler Drive and Chilco Street (Figure 2). Constructed in 1963, 150 Jefferson Drive is a one-story commercial warehouse building. 150 Jefferson Drive was developed as part of the Bohannon Industrial Park, an early example of the industrial park as a new type of development that emerged along with suburban growth.[1] As such, the surrounding buildings are typical of those in an industrial/ office park consisting of mid-rise office buildings and commercial warehouses.

Figure 1: Parcel map with 150 Jefferson Drive shown in yellow outline.
Source: San Mateo County Planning and Building Department

The main façade of the building faces north onto Jefferson Drive. The east side of the site is paved in blacktop and serves as a parking lot for the building. The blacktop continues to the rear of the site and along the south end of the building and around to the west side of the building, creating a horseshoe shape around the building.

The north side of the site is characterized by light vegetation, including a planted area that is punctuated by a paved-concrete path from the sidewalk to the main entrance. There are trees lining the north façade. The east side of the site is lined with a manicured hedge that ends at the south side of the site, where the blacktop meets a strip of un-manicured dirt track with some unplanted, but manicured vegetation.

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[1] Louise Monzingo, Pastoral Capitalism: A History of Suburban Corporate Landscapes (Boston, Ma: Massachusetts institute of technology, 2011) 179.

EXTERIOR

The one-story commercial office/warehouse building features a rectangular plan that angles slightly at the southeastern corner, following the lot shape. It is a reinforced concrete structure with a reinforced concrete foundation. The main entrance is short, 7 bay glass curtain wall with aluminum trim, one bay being a hinged-glass door. A flat, concrete roof overhang covers the length of the main entrance. The main façade is characterized by a repeating pattern of exterior plaster panels and concrete block with narrow obscure glass windows in the recessed space between the panels to the east side of the main entrance. The west side of the main entrance is concrete block.

Figure 2: North main entrance from Jefferson Drive, looking south.
Source: MIG, Inc., February 2016.

Figure 3: North façade from Jefferson Drive, looking south.
Source: MIG, Inc., February 2016.

Figure 4: North façade plaster panels and obscured glass windows from Jefferson Drive, looking east.
Source: MIG, Inc., February 2016.

The east side of the exterior has a plate glass wall with a pitched, metal roof creating an outdoor patio area on top of a poured concrete pad with a path that leads to the parking lot. Concrete stairs and a concrete ADA ramp both lead to a door on the northeast side of the building. There are six truck loading docks with metal roll-up doors to the south of the northeast exterior door, with a flat metal canopy above the garage doors. There is a second exterior door on the southeast end of the building. The south side of the original 1963 building has a temporary, wood and corrugated steel canopy structure. There is one loading door to the west of the temporary canopy structure, also part of the original 1963 building. There is a chain-link enclosure affixed to the south end of the building with a wood and corrugated steel roof. There is a second loading garage on the southwest side of the building, as part of the 1970 office/warehouse addition. The western wall of the building, also part of the 1970 office/warehouse addition, has two exterior doors at grade level.

Figure 5: East façade showing loading garages and covered patio area, looking southwest.
Source: MIG, Inc., February 2016.

Figure 6: South façade with temporary awning structure, chain-link enclosure and loading door, looking northwest.
Source: MIG, Inc., February 2016.

Figure 7: East façade covered patio area, looking west.
Source: MIG, Inc., February 2016.

Figure 8: West façade with two exterior doors.
Source: MIG, Inc., February 2016

SURROUNDING NEIGHBORHOOD

The neighborhood immediately surrounding 150 Jefferson Drive is comprised of commercial and warehouse buildings. The area east of Marsh Road and west of Chilco Street between the Bayfront Expressway and the Bayshore Freeway is void of any residential, civic or non-commercial land use. The architecture in the immediate area consists of little variety. Many buildings are of the same era of 150 Jefferson Drive, also characterized by simple forms and flat roofs. In recent years, there has also been an influx of new construction. These buildings tend to be commercial office space rather than warehouse space. They also are taller, beam construction buildings. This is most clearly evidenced by the three-story glass building at 180 Jefferson Drive.

The surrounding area does not contain any recorded, qualified historic resources.

HISTORIC CONTEXT

PROJECT SITE HISTORY AND ARCHITECTURAL DESIGN

Menlo Park was initially home to the Ohlone Native Americans. Spanish rule was introduced in 1769 when Don Gaspar de Portola camped near "El Palo Alto" after the discovery of the San Francisco Bay. The colonizing of the peninsula began soon after following the expedition of Juan Bautista DeAnza and the establishment of Mission Delores and the Presidio of San Francisco in 1766.[2]

In 1853, Don Jose Dario Arguello legally obtained the title to the land where 150 Jefferson sits today. In 1854, Dennis Oliver and Daniel McGlynn purchased 1,700 acres from Arguello and the town of Menlo Park began to grow with the introduction of the Southern Pacific Railroad.[3] For generations, the land where 150 Jefferson sits today was undeveloped, referred to as Sweeny Oaks, it served mostly as agricultural land. [4]Menlo Park remained a small town until World War II. Between 1943-1946 the Dibble General Hospital was built to care for injured soldiers, contributing to an increased population.[5] Following World War II, the hospital campus became the site of the Menlo Park Civic Center, Stanford Research Institute, and the United States Geological Survey. Much like the rest of the United States, postwar development boomed along the Peninsula, including in Menlo Park. Residential communities were growing at a rate never before seen. With the increased pace of residential development, came a new planning design – the industrial park.

David Bohannon purchased a 200-acre site in Menlo Park in 1954 and called it the Bohannon Industrial Park. A new planning design concept, he envisioned the industrial park to be a complex of office and industrial buildings. The industrial park as a planning design was a new idea responding to suburban growth. [6] It allowed people to not have to commute to the city, provided ample parking space, and also allowed companies to avoid having to build their own headquarters.

The lot at 150 Jefferson Drive was subdivided in 1963. It is the same year that the original building was built for Bucal Inc., a hospital supply company. The office/warehouse building was designed by Charles Luckman Associates, a Los Angeles Based firm headed by famed architect Charles Luckman. In 1970, an addition was made to the warehouse and office space. The addition was designed by

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[2] City of Menlo Park website, Early Days in Menlo Park, prepared by Menlo Park Historical Association, October 1985, http://www.menlopark.org/888/Menlo-Park-history, retrieved February 20, 2016

[3] Cynthia Karpa McCarthy, *Belmont* (Charleston, SC: Arcadia Publishing, 2014) 9-12.

[4] Early Days in Menlo Park, http://www.menlopark.org/888/Menlo-Park-history

[5] Ibid.

[6] Monzingo, 174

Cabak Associates, a local firm based in Menlo Park. The addition did not alter the original design in a significant manner. It was a seamless continuation of the original building, following the original scale and using the same materials. The site has remained largely unchanged since 1970.

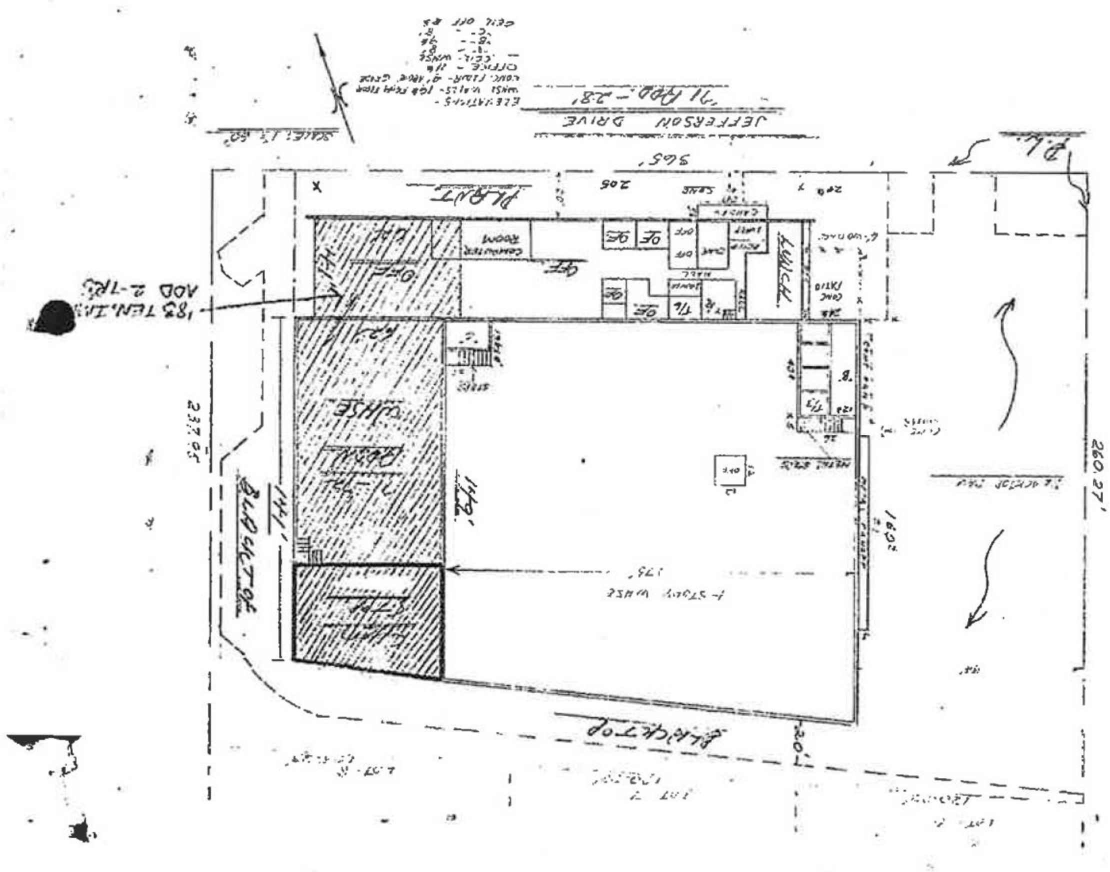

Figure 9: Site plan of 150 Jefferson Drive with crosshatch showing 1970 addition.
Source: San Mateo County Accessor's Office

Site Chronology

1954: Bohnannon Industrial Park formed
1963: Site subdivided
1963: Office/Warehouse building designed by Charles Luckman Associates built
1970: Office/Warehouse addition designed by Cabak Associates
1970: HVAC system added
1988: New roof installed
1998: Upgrades to the electrical systems

Architectural Style

150 Jefferson Drive possesses many of the elements of the International Style of modernist architecture. International Style modernism is defined by rectilinear forms, plane surfaces devoid of applied ornamentation, and open, fluid spaces. The

minimalism of the style is reinforced by the use of modern materials, including glass for the façade, steel for support, and concrete for interior supports and floors. Though 150 Jefferson Drive is a simple building, it is drawing on the principles of the International Style. The entrance is a curtain glass façade. Charles Luckman was known for his adherence to the functionalist ideals of modernist design. As such, the overall structure is extremely simple in form, characterized by straight lines and little ornament. The ornament that does exist, the plaster panels on the northeast side of the façade, only further the modernist expression. The rhythm of the panels and the windows is regular, slight and reinforces the use of clean lines. Furthermore, the use of concrete as the main material is also typical of a modernist building drawing from the International Style.

CHARLES LUCKMAN ASSOCIATES

Charles Luckman was a dynamic figure in the United States following the Great Depression. Born in 1909, Luckman proved to be a savvy businessman at a young age. He became the president of Pepsodent by age 30, where his marketing techniques were recognized as quadrupling business profits. In 1946, after Pepsodent was acquired by Lever Brothers, he became Lever's president.[7]

He was the President of the company when it commissioned the construction of Lever House in New York in 1952 by Skidmore, Owings and Merrill. One of the first glass skyscrapers in New York, Lever House is regarded as one of the most important modernist buildings in the United States. Luckman, who graduated with a BA in Architecture from University of Illinois was Ignited by the modernist architecture movement and the success of the Lever House design. As a result, he decided to leave his corporate job and return to pursuing architecture.

Luckman formed a partnership with Los Angeles based architect William Pereria. Together they specialized in commercial architecture, airports and Air Force Bases. Their partnership ended in 1959. The formation of Charles Luckman and Associates followed. During this period, Luckman designed Madison Square Garden (1968), the structure that replaced New York's original Penn Station. The demolition of Penn Station kindled the early historic preservation movement in the United States. As such, many were critical of his design for the new building. Other notable works by Luckman include: Johnson Space Center in Houston (1962) the Prudential Center in Boston (1964), Forum in Los Angeles (1967), and Broadway Plaza in Los Angeles (1973).[8] He sold his architecture firm in 1968 to Ogden Corporation and became president of its subsidiary, a real estate development firm, Ogden Development.

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[7] Herbert Muschamp, "Charles Luckman, Architect Who Designed Penn Station's Replacement, Dies at 89" (New York, NY: New York Times, 28 January 1999)

[8] Online Archive of California, *Charles Luckman,* Loyola Marymount University, http://www.oac.cdlib.org/findaid/ark:/13030/c8057gjv/entire_text/, accessed February 19, 2016

Charles Luckman had a rather distinguished public profile. He was director of the Freedom Train, part of President Truman's program for rebuilding Europe after World War II. He was also on the board of councilors of Brain Research Institute at UCLA and president of the Los Angeles Ballet. He was connected to the Bay Area through his seat on the California State University Board of Trustees at California State University, San Jose. He passed away at the age of 89 in 1999.

Cabak Associates

Caback Associates was founded in 1969, one year before the firm designed the addition to the original 1963 building. They were a local architectural and engineering firm. There does not seem to be any significant buildings in their portfolio. The firm closed in 1979.

EVALUATION

National Register of Historic Places

The National Register of Historic Places (National Register) is the United States' most comprehensive inventory of historic resources. The National Register is administered by the National Park Service and includes buildings, sites, structures, objects, and districts that represent historic, architectural, engineering, architectural, engineering, archeological or cultural significance at the national, state or local level. A resources over fifty years old is eligible for the National Register if it meets any one of the four criteria of significance and it sufficiently retains historic integrity. Resources under fifty years of age can be determined eligible if they are of "exceptional importance," of if they contribute to a potential historic district. National Register Criteria are defined in detail in National Register Bulletin Number 15: How to Apply National Register Criteria for Evaluation. The four basic criteria under which a resource can be considered eligible for listing on the National Register are:

- **Criterion A – Event**: Properties associated with events that have made a significant contribution to the broad patterns of our history.
- **Criterion B – Person**: Properties associated with the lives of persons significant in our past.
- **Criterion C- Design/Construction**: Properties that embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values or that represent a significant distinguishable entity whose components lack individual distinction.
- **Criterion E** – Information Potential: Properties that have yielded, or may be likely to yield, information important in prehistory or history.

California Register of Historical Resources

The California Register of Historical Resources (California Register) is an inventory of significant architectural, archeological, and historical resources in the State of California. Resources can be listed on the California Register through a number of methods. State Historical Landmarks and National Register listed properties are automatically listed on the California Register. Properties can also be nominated to the California Register by local governments, private organizations, or citizens. The evaluative criteria used by the California Register for determining eligibility are closely based on those developed by the National Park Service for the National Register.

In order for a property to be eligible for listing on the California Register, it must be found significant under one or more of the following criteria:

- **Criterion 1** - **Events**: Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California of the United States.
- **Criterion 2** - **Persons**: Resources that are associated with the lives of persons important to local, California, or national history.
- **Criterion 3** - **Architecture**: Resources that embody the distinctive characteristics of a type, period, region, or method of construction or represent the work of a master, or possesses high artistic value.
- **Criterion 4 - Information Potential**: Resources or sites that have yielded or have the potential to yield information important to the prehistory or history of the local area, California, or the nation.
- Resources eligible for the National Register of Historic Places are automatically listed on the California Register of Historical Resources.[9]

Criterion A/1 – Event
150 Jefferson Drive does not appear to be individually eligible for listing on the National Register under Criterion A or the California Register under Criterion 1 for association with events that have made a significant contribution to the broad patterns of local, state or national history. The property was constructed during a time of increased development in this area of Menlo Park. As part of Bohannon Industrial Park, it was one of many buildings being constructed around the same time. Together, the subdivision and development of several commercial and warehouse spaces as part of the new development concept, the suburban industrial/office park as part of Bohannon Industrial Park does illustrate a change in urban planning practices. 150 Jefferson Drive, however, does not individually represent this context. It is as associated with this new pattern of development as other industrial/office parks during this time. In sum, 150 Jefferson Drive does not make a significant contribution to social, political and economic trends that were occurring to urban planning during the 1960s such that it would be individually eligible for listing on the National Register or California Register.

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[9] California Office of Historic Preservation, *Technical Assistant Series No. 7*, *How to Nominate a Resource to the California Register of Historical Resources* (Sacramento, CA: California Office of State Publishing, 4 September 2001) 11.

Criterion B/2 – Person
150 Jefferson Drive does not appear to be individually eligible for listing on the National Register under Criterion B or the California Register 2 for resources that are associated with the lives of persons significant in history. Though Charles Luckman Associates did design the building, there is no evidence that Charles Luckman himself was involved in the design, details or construction of this project. Furthermore, given Luckman's portfolio of work described above, this building does not stand out in association with Luckman as one of his most distinguishable works.

Criterion C/3 – Design/Construction
150 Jefferson Drive does not appear to be individually listed on the National Register under Criterion C or the California Register under Criterion 3. The design of 150 Jefferson Drive follows the popular ideas in architecture of the time. It also does not appear to be significant for its use of International Style and modernist era vocabulary. This building does not embody *distinctive* characteristics of a particular type, period or method of construction. The site plan and building design follow ideas of commercial/warehouse construction of the 1960s, but it does not rise to the level of individual significance for this reason that would make it eligible for listing on the National Register or California Register.

Criterion D/4 – Information Potential
Criterion D/4 is typically related to archeological resources rather than built resources. When Criterion D/4 does relate to built resources, it is for cases when the building itself is the principal sources of important construction-related information. Based on historic research, this criterion is not applicable to 150 Jefferson Drive.

INTEGRITY
To qualify for listing on the California Register, a property must possess significance under one of the aforementioned criteria and have historic integrity. The process of determining integrity is similar for both the California Register and the National Register. The same seven aspects of integrity – location, design, setting, material, workmanship, feeling and association – are used to evaluate a resource's eligibility for listing on the California Register and the National Register. According to the National Register Bulletin: How to Apply the National Register Criteria for Evaluation, these seven characteristics are defined as follows:

> **Location** is the place where the historic property was constructed.
> **Design** is the combination of elements that create the form, plans, space, structure and style of the property.
> **Setting** addresses the physical environment of the historic property inclusive of the landscape and spatial relationship of the building.

Materials refer to the physical elements that were combined or deposited during a particular period of time and in a particular pattern of configuration to form the historic property.
Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history.
Feeling is the property's expression of the aesthetic or historic sense of a particular period of time.
Association is the direct link between an important historic event or person and a historic property.

150 Jefferson Drive retains integrity of location and setting. It is situated on its original lot and the surrounding area is characterized by commercial, office and warehouse buildings. The property was altered since its 1963 construction through the 1970 addition. Though the addition did not demolish a significant portion of the original structure, it did alter the original design, material and workmanship diminishing its integrity. It remains in use as an office/warehouse for Bay Associates Wire Technology Corporation, a cable and wire production company. Though it is a different type of industry use, it is consistent with its original use and retains integrity of feeling and association. Overall, the property retains some architectural integrity.

CHARACTER DEFINING FEATURES

For a property to be eligible for designation, the essential physical features that enable a property to convey its historic identity must be typically evident. To be eligible, a property must clearly contain enough of those characteristics, and the features must retain a sufficient degree of integrity. Character can be expressed in terms such as form, proportion, structure, plan, style or materials. The character defining features of 150 Jefferson Drive include:

- Site plan organization that follows the contour of the slightly angled lot line
- Rectangular one-story massing
- The curtain glass entrance area
- Plaster panels on the northwest façade
- Features of mid-century architectural design, including:
    - Reinforced concrete construction
    - Flat roof
    - Flat concrete awning at the main entrance roofline

CONCLUSION

Constructed in 1963 as an office/warehouse in the Bohannon Industrial Park does not appear to rise to a level of significance that would make it eligible for listing on the National Register or the California Register. The City of Menlo Park does not maintain a local register. 150 Jefferson Drive would therefore not be considered a historical resource for the purposes of CEQA.

REFEREENCES

California Office of Historic Preservation, *Technical Assistant Series No. 7*, *How to Nominate a Resource to the California Register of Historical Resources* (Sacramento, CA: California Office of State Publishing, 4 September 2001) 11.

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McCarthy, Cynthia Karpa. *Belmont*, Charleston, SC: Arcadia Publishing, 2014.

Menlo Park Historical Association

Menlo Park Planning and Building Division

Monzingo, Louise. *Pastoral Capitalism: A History of Suburban Corporate Landscapes*, Boston, Ma: Massachusetts Institute of Technology, 2011.

Muschamp ,Herbert. "Charles Luckman, Architect Who Designed Penn Station's Replacement, Dies at 89," New York, NY: New York Times, 28 January 1999.

Official Map of San Mateo County, 1894

Online Archive of California, *Charles Luckman,* Loyola Marymount University, http://www.oac.cdlib.org/findaid/ark:/13030/c8057gjv/entire_text/, accessed February 19, 2016.

San Mateo County Accessor's Office

San Mateo County Planning and Building Department

APPENDIX G:

DTSC ENVIRONMENTAL OVERSIGHT AGREEMENT / SITE HAZARDS REVIEW REPORTS

- G1: October 29, 2015 Environmental Oversight Agreement
- G2: December 12, 2014 Soil, Soil Vapor, and Ground Water Investigation
- G3: May 2016 PEA and June 2016 DTSC PEA Approval Letter
- G4: January 2015 Pipeline Safety Hazard Assessment

APPENDIX G1:

OCTOBER 29, 2015 ENVIRONMENTAL OVERSIGHT AGREEMENT

Matthew Rodriquez
Secretary for
Environmental Protection

Department of Toxic Substances Control

Barbara A. Lee, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Edmund G. Brown Jr.
Governor

October 29, 2015

Mr. Matthew Zito
Chief Facilities Officer
Sequoia Union High School District
480 James Avenue
Redwood City, California 94062

ENVIRONMENTAL OVERSIGHT AGREEMENT, DOCKET NUMBER HSA-FY15/16-049, 150 JEFFERSON DRIVE (AKA MENLO PARK PROPOSED SCHOOL), SEQUOIA UNION HIGH SCHOOL DISTRICT (SITE CODE: 204273-11)

Dear Mr. Zito:

Enclosed for your file is a fully executed Environmental Oversight Agreement (Agreement) for the subject Site. The Agreement will cover the Department of Toxic Substances Control (DTSC) oversight of the preparation of a Preliminary Endangerment Assessment (PEA) and/or the review and comment on a PEA Report.

DTSC has assigned Ms. Mellan Songco as the project manager who will be responsible for the technical interface with you and/or your environmental consultant. Ms. Songco can be reached at (916) 255-6527 or via e-mail at Mellan.Songco@dtsc.ca.gov.

As noted in the Agreement, the advance payment of $12,560.00 is due within 10 days of Agreement execution. It is important that the following information be clearly marked on the face of the check: "Docket Number HSA-FY15/16-049 and Envirostor Site Code 204273-11". The advance payment check should be sent directly to:

Department of Toxic Substances Control
Accounting/Cashier
1001 I Street, 21st Floor
P.O. Box 806
Sacramento, California 95812-0806

A photocopy of the check should be sent to Ms. Songco at the letterhead address above.

Thank you for your cooperation with DTSC. If you have any questions, please contact Mellan Songco at (916) 255-6527 or via e-mail at Mellan.Songco@dtsc.ca.gov.

Sincerely,

Cynthia Berato for

Ellen DelMar
Agreement Coordinator
Brownfields and Environmental Restoration Program

Enclosure: *Fully Executed Environmental Oversight Agreement*

cc: (via e-mail)

Mr. Michael O'Neill
Consultant/Environmental Coordinator
California Department of Education
MOneill@cde.ca.gov

Mr. Jose Salcedo
Department of Toxic Substances Control
Jose.Salcedo@dtsc.ca.gov

Ms. Margarita Serko
Department of Toxic Substances Control
Margarita.Serko@dtsc.ca.gov

Ms. Min Sun, Accounting Analyst
Cost Recovery Unit – Headquarters
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Ms. Mellan Songco
Department of Toxic Substances Control
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Schools Reading File – Sacramento Office (hard copy)

STATE OF CALIFORNIA
ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Agreement Regarding:	)	Docket Number HSA-FY15/16-049
	)	
150 Jefferson Drive (AKA Menlo Park Proposed School)	)	Environmental Oversight Agreement
150 Jefferson Drive	)	
Menlo Park, California 94025	)	
Site Code Number: 204273-11	)	
	)	Education Code
Project Proponent:	)	Sections 17210, 17210.1, 17213.1
	)	
Sequoia Union High School District	)	
480 James Avenue	)	
Redwood City, California 94062	)	
	)	

I. INTRODUCTION

1.1 Parties. The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) enters into this Environmental Oversight Agreement (Agreement) with the Sequoia Union High School District (Proponent). DTSC and the Proponent are referred to collectively herein as the "Parties."

1.2 Site. The property, which is the subject of this Agreement, (Site) is a proposed school site and is located at 150 Jefferson Drive, Menlo Park, San Mateo County, California 94025. The Site is identified by Assessor's Parcel Number 055-243-030. A location map and a Site diagram are attached as Exhibit A and Exhibit B.

1.3 Jurisdiction. This Agreement is entered into by DTSC and the Proponent pursuant to Education Code section 17213.1. This section authorizes DTSC to enter into an enforceable agreement with the Proponent to oversee the Proponent's preparation of a Preliminary Endangerment Assessment (PEA) for the Site and other related activities, if necessary.

1.4 Purpose. The purpose of this Agreement is for the Proponent to perform a PEA under the oversight of DTSC. The definition and requirements of a PEA, for purposes of this Agreement, are those set forth in Education Code sections 17210, 17210.1 and 17213.1. The purpose of this Agreement is also for DTSC to obtain reimbursement from the Proponent for DTSC's oversight costs.

II. BACKGROUND

2.1 Ownership. The Site is owned by the Proponent.

2.2 Current Knowledge of the Site. The Proponent submitted an application requesting to enter into this Agreement for DTSC's oversight of the preparation of a PEA for the Site.

2.3 Physical Description. The approximately 2.17-acre Site is currently occupied with an asphalt pavement parking lot and warehouse building. The property surrounding the Site is primarily commercial.

2.4 Site History. The Site appears to have been undeveloped land until construction of the existing building in approximately 1962. Building plans from 1962 indicate that the building was constructed for Bucal, Inc., however, it is not known if Bucal, Inc. ever occupied the building. Scientific Products, a division of American Hospital Supply Corporation, is listed in city directories as an occupant of the building between at least 1963 and 1975. Jonker Business Machines (along with Scientific Products) also was identified as an occupant in a 1970 city directory. Bay Associates Wire Technologies, the current occupant, appears to have occupied the building since the late 1970s or early 1980s. Bay Associates uses the on-Site building for manufacturing of wire products and associated administrative office purposes.

III.
AGREEMENT

3.0 **IT IS HEREBY AGREED THAT** DTSC will provide review, oversight and approval of the PEA conducted by the Proponent in accordance with the Scope of Work contained in Exhibit C. The Proponent shall conduct the activities required under this Agreement in the manner specified herein and in accordance with the schedule specified in Exhibit D. All work shall be performed consistent with Education Code sections 17210, 17210.1 and 17213.1; Health and Safety Code section 25300 et seq., as amended; the National Contingency Plan (Code of Federal Regulations, Title 40, Part 300), as amended; and United States Environmental Protection Agency and DTSC Superfund guidance documents regarding site investigation and remediation.

3.1 Scope of Work and DTSC Oversight. DTSC shall review and provide the Proponent with written comments on all of the Proponent's deliverables as described in Exhibit C (Scope of Work) and other documents determined by DTSC to be necessary to the scope of the project or the implementation of this Agreement. DTSC shall provide oversight of field activities, including sampling, as appropriate.

3.2 Additional Activities. Additional activities may be conducted and DTSC's oversight provided by amendment to this Agreement or Exhibits attached hereto in accordance with Paragraph 3.17 of this Agreement. If DTSC expects additional oversight costs to be incurred related to these additional activities, DTSC will provide a written estimate of the additional oversight cost to the Proponent.

3.3 Agreement Managers. Mr. José Salcedo, Unit Chief, Schools Unit, Sacramento Office, Brownfields and Environmental Restoration Program, is designated by DTSC as its Manager for this Agreement. Mr. James Lianides, Superintendent, Sequoia Union High School District, is designated by the Proponent as its Manager for this Agreement. Each Party to this Agreement shall provide at least 10 days advance written notice to the other of any change in its designated Manager.

3.4 Notices and Submittals. All notices, documents and communications required to be given under this Agreement, unless otherwise specified herein, shall be sent by regular mail to the respective Agreement Managers at the following addresses:

(a) To DTSC:

Mr. José, Unit Chief
Schools Unit – Sacramento Office
Brownfields and Environmental Restoration Program
Attn: Ms. Mellan Songco, Project Manager
Department of Toxic Substances Control
8800 Cal Center Drive, 2nd Floor
Sacramento, California 95826

(b) To the Proponent:

Mr. James Lianides, Superintendent
Sequoia Union High School District
480 James Avenue
Redwood City, California 94062

For all documents required to be given to DTSC, the Proponent shall submit one hard (paper) copy and one electronic copy in Adobe Portable Document Format (PDF), as specified in Exhibit E. All submittals shall include applicable signatures and certification stamps.

3.5 DTSC Review and Approval. If DTSC determines that any report, plan, schedule or other document submitted for approval pursuant to this Agreement fails to comply with this Agreement or fails to protect public health or safety or the environment, DTSC may (a) return comments to the Proponent with recommended changes and a date by which the Proponent shall submit to DTSC a revised document incorporating the recommended changes; or (b) modify the document as deemed necessary and approve the document as modified. Any modifications, comments or other directives issued pursuant to this Paragraph are incorporated into this Agreement.

3.6 Communications. All approvals and decisions of DTSC made regarding submittals and notifications will be communicated to the Proponent in writing by DTSC's Agreement Manager or his/her designee. Confirmation of a designation shall be provided in writing by DTSC to validate any approvals or decisions made by the designee of DTSC's Agreement Manager. No informal advice, guidance, suggestions or comments by DTSC regarding reports, plans, specifications, schedules or any other writings by the Proponent shall be construed to relieve the Proponent of the obligations to obtain such written approvals.

3.7 Stop Work Order. In the event DTSC determines that any activity (whether or not pursued in compliance with this Agreement) may pose an imminent or substantial endangerment to the health and safety of people on the Site or in the surrounding area or to the environment, DTSC may order the Proponent to stop further implementation of this Agreement for such period of time as may be needed to abate the endangerment. In the event that DTSC determines that any activities (whether or not pursued in compliance with this Agreement) are proceeding without DTSC's authorization, DTSC may order the Proponent to stop further implementation of this Agreement or activities for such a period of time needed to obtain DTSC's authorization, if such authorization is appropriate. Any deadline in this Agreement directly affected by a Stop Work Order under this Paragraph shall be extended for the term of the Stop Work Order.

3.8 Payment. The Proponent shall pay (1) all costs incurred by DTSC for preparation of this Agreement and review of documents submitted prior to the effective date of the Agreement, and (2) all costs incurred by DTSC in providing oversight pursuant to this Agreement, including review of the documents described in Exhibit C and associated documents, and in providing oversight of field activities. An estimate of DTSC's oversight costs is attached as Exhibit F. It is understood by the Parties that Exhibit F is an estimate and cannot be relied upon as the final cost figure. DTSC will bill the Proponent quarterly. The Proponent shall make payment within 30 days of receipt of DTSC's billing. Such billings will reflect any amounts that have been advanced to DTSC by the Proponent.

3.8.1 In anticipation of services to be rendered, the Proponent shall make an advance payment of $12,560.00 to DTSC. That payment shall be made no later than 10 days after this Agreement is fully executed. If the Proponent's advance payment does not cover all costs payable to DTSC under this Agreement, the Proponent shall pay the additional costs within 30 days of receipt of a billing from DTSC.

3.8.2 If any billing is not paid by the Proponent within 60 days after it is sent, DTSC will commence calculating interest from the date of the billing, at the same rate of return earned on investment in the Surplus Money Investment Fund pursuant to Government Code section 16475 and Health and Safety Code section 25360.1.

3.8.3 All payments made by the Proponent pursuant to this Agreement shall be by a warrant or check made payable to the "Department of Toxic Substances Control," and bearing on its face the project code for the Site (Site Code Number 204273) and the Docket Number (Docket Number HSA-FY15/16-049) of this Agreement. Payments shall be sent to:

Accounting Office
Department of Toxic Substances Control
P.O. Box 806
Sacramento, CA 95812-0806

A photocopy of the warrant or check shall be sent concurrently to DTSC's Agreement Manager. The Proponent requests future DTSC billings to be submitted to:

Ms. Louise Pacheco
Construction Department
Sequoia Union High School Department
480 James Avenue
Redwood City, California 94062

3.8.4 If the advance payment exceeds DTSC's actual oversight costs, DTSC will provide an accounting for expenses and refund the difference within 120 days after termination of this Agreement in accordance with Paragraph 3.18. In no other case shall the Proponent be entitled to a refund from DTSC or to assert a claim against DTSC for any amount paid or expended under this Agreement.

3.8.5 If the Proponent disputes a DTSC billing, or any part thereof, the Proponent shall notify DTSC's assigned project manager and attempt to informally resolve the dispute with DTSC's project manager and unit chief. If the Proponent desires to formally request dispute resolution with regard to the billing, the Proponent shall file a request for dispute resolution in writing within 45 days of the date of the billing in dispute. The written request shall describe all issues in dispute and shall set forth the reasons for the dispute, both factual and legal. If the dispute pertains only to a portion of the costs included in the billing, the Proponent shall pay all costs which are undisputed. The filing of a notice of dispute pursuant to this Paragraph shall not stay the accrual of interest on any unpaid costs pending resolution of the dispute. The written request shall be sent to:

Chief, Collections and Resolution Unit
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812-0806
(916) 322-0481

A copy of the written request for dispute resolution shall also be sent to DTSC's Agreement Manager. A decision on the billing dispute will be rendered by the Special Assistant for Cost Recovery and Reimbursement Policy or other DTSC designee.

3.9 Condition Precedent. It is expressly understood and agreed that DTSC's receipt of the advance payment described in Paragraph 3.8.1 is a condition precedent to DTSC's obligation to provide oversight, review, comment, and/or approval pursuant to this Agreement.

3.10 Record Retention. DTSC shall retain all cost records associated with the work performed under this Agreement for such time periods as may be required by applicable State law. The Proponent may request to inspect all documents which support DTSC's cost determination in accordance with the Public Records Act, Government Code section 6250 et seq.

3.11 Project Coordinator. The work performed by and on behalf of the Proponent pursuant to this Agreement shall be under the direction and supervision of a project coordinator which shall be a qualified environmental assessor as specified in Education Code section 17210(b) with at least three (3) years' experience in conducting PEAs. The Proponent shall submit: a) the name and address of the project coordinator; and b) in order to demonstrate the qualifications of an environmental assessor, the resume of the project coordinator. The Proponent shall notify DTSC within 10 business days of any change in the identity of the project coordinator. All engineering and geological work shall be conducted in conformance with applicable State law, including but not limited to, Business and Professions Code sections 6735 and 7835.

3.12 Access. The Proponent shall provide and/or use best efforts to obtain access to the Site and offsite areas to which access is necessary to implement this Agreement. Such access shall be provided to DTSC's employees, contractors, and consultants at all reasonable times. Nothing in this Paragraph is intended or shall be construed to limit in any way the right of entry or inspection that DTSC or any other agency may otherwise have by operation of any law. The Proponent shall give its permission, to the extent it has authority to give such permission, to DTSC and its authorized representatives to enter and move freely at the Site at all reasonable times for purposes including, but not limited to: inspecting records, operating logs, sampling and analytic data, and contracts relating to this Site; reviewing the progress of the Proponent in carrying out the terms of this Agreement; conducting such tests as DTSC may deem necessary; and verifying the data submitted to DTSC by the Proponent.

3.13 Sampling, Data and Document Availability. When requested by DTSC, the Proponent shall make available to DTSC, and shall provide copies of, all data and information concerning the presence, if any, of hazardous materials at the Site, including electronic data, technical records and contractual documents, sampling and monitoring information and photographs and maps, whether or not such data and information was developed pursuant to this Agreement. The required information or data about the Site may include information that is publicly available or that is within the Proponent's possession or control.

3.14 Notification of Field Activities. The Proponent shall inform DTSC at least seven (7) days in advance of all field activities pursuant to this Agreement and shall allow DTSC and its authorized representatives to take splits of any samples collected by the Proponent pursuant to this Agreement. DTSC and the Proponent will agree to the most appropriate method of collecting the split samples.

3.15 Notification of Environmental Condition. The Proponent shall notify DTSC's Agreement Manager immediately upon learning of any condition posing an immediate threat to public health or safety or the environment. Within seven (7) days of the onset of such a condition, the Proponent shall furnish a report to DTSC, signed by the Proponent's Agreement Manager, setting forth the events which occurred and the measures taken in the response thereto.

3.16 Preservation of Documentation. The Proponent shall maintain a central repository of the data, reports, and other documents prepared pursuant to this Agreement. All such data, reports and other documents shall be preserved by the Proponent for a minimum of six (6) years after the conclusion of all activities under this Agreement. If DTSC requests that some or all of these documents be preserved for a longer period of time, the Proponent shall comply with that request, deliver the documents to DTSC, or permit DTSC to copy the documents prior to destruction. The Proponent shall notify DTSC in writing at least 90 days prior to destroying any documents prepared pursuant to this Agreement. If any litigation, claim, negotiation, audit or other action involving the records has been started before the expiration of the six-year period, the related records shall be retained until the completion and resolution of all issues arising therefrom or until the end of the six-year period, whichever is later.

3.17 Amendments. This Agreement may be amended or modified solely upon written consent of all Parties. Such amendments or modifications may be proposed by any Party and shall be effective the third business day following the day the last Party signing the amendment or modification sends its notification of signing to the other Party. The Parties may agree to a different effective date.

3.18 Termination. Each Party to this Agreement reserves the right unilaterally to terminate this Agreement for any reason. Termination may be accomplished by giving a 30-day advance written notice of the election to terminate this Agreement to the other Party. In the event that this Agreement is terminated, the Proponent shall be responsible for DTSC's costs incurred in the implementation and administration of this Agreement through the effective date of termination. DTSC will submit a final billing within 120 days from the effective date of termination.

3.19 Exhibits. All exhibits identified in and attached to this Agreement are incorporated herein by this reference.

3.20 Time Periods. Unless otherwise specified, time periods begin from the effective date of this Agreement and "days" means calendar days. "Business days" means all calendar days that are not weekends or official State holidays.

3.21 Proponent Liabilities. The terms and conditions of this Agreement constitute requirements issued or adopted by DTSC for purposes of Health and Safety Code section 25187. Nothing in this Agreement shall constitute or be considered a satisfaction or release from liability for any condition or claim arising as a result of the Proponent's past, current, or future operations. The Proponent shall not be deemed to be an operator of the Site under State or federal law solely by reason of conducting the PEA subject to DTSC oversight in compliance with this Agreement.

3.22 Government Liabilities. The State of California shall not be liable for any injuries or damages to persons or property resulting from acts or omissions by the Proponent or by related parties in carrying out activities pursuant to this Agreement, nor shall the State of California be held as a party to any contract entered into by the Proponent or its agents in carrying out the activities pursuant to this Agreement.

3.23 Third-Party Actions. In the event that the Proponent is or becomes a party to any suit or claim for damages or contribution relating to the Site to which DTSC is not a party, the Proponent shall notify DTSC in writing within 10 days after service of the complaint in the third-party action. The Proponent shall pay all costs incurred by DTSC relating to such third-party actions, including but not limited to responding to subpoenas.

3.24 Reservation of Rights. DTSC and the Proponent reserve the following rights.

(a) DTSC reserves its right to pursue cost recovery under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, Health and Safety Code section 25360 et seq., or any other applicable provision of the law.

(b) Nothing in this Agreement is intended or shall be construed to limit or preclude DTSC from taking any action authorized by law or equity to protect public health and safety or the environment and recovering the costs thereof.

(c) Nothing in this Agreement shall constitute or be construed as a waiver of the Proponent's rights, (including any covenant not to sue or release) with respect to any claim, cause of action, or demand in law or equity that the Proponent may have against any "person", as defined in section 101(21) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, or Health and Safety Code section 25319, that is not a signatory to this Agreement.

(d) Nothing in this Agreement is intended or shall be construed to limit the rights of any of the Parties with respect to claims arising out of or relating to the deposit or disposal at any other location of substances removed from the Site.

(e) By entering into this Agreement, the Proponent does not admit to any fact, fault or liability under any statute or regulation.

3.25 Compliance with Applicable Laws. Nothing in this Agreement shall relieve the Proponent from complying with all applicable federal, State and local laws, regulations and requirements. The Proponent shall carry out this Agreement in compliance with all applicable requirements, including, but not limited to, requirements to obtain permits and to assure worker safety.

3.26 California Law. This Agreement shall be governed, performed and interpreted under the laws of the State of California.

3.27 Severability. If any portion of this Agreement is ultimately determined not to be enforceable, that portion will be severed from the Agreement and the severability shall not affect the enforceability of the remaining terms of the Agreement.

3.28 Parties Bound. This Agreement applies to and is binding upon the Proponent and its officers, directors, agents, employees, contractors, consultants, receivers, trustees, administrators, successors and assignees, including but not limited to individuals, partners and subsidiary, and upon any successor agency of the State of California that may have responsibility for and jurisdiction over the subject matter of this Agreement. No change in the ownership or corporate or business status of any signatory, or of the facility or Site shall alter any signatory's responsibilities under this Agreement.

3.29 Effective Date. The effective date of this Agreement is the date when this Agreement is fully executed.

3.30 Representative Authority. Each undersigned representative of the Parties to this Agreement certifies that she or he is fully authorized to enter into the terms and conditions of this Agreement and to execute and legally bind the Parties to this Agreement.

3.31 Counterparts. This Agreement may be executed and delivered in any number of counterparts, each of which when executed and delivered shall be deemed to be an original, but such counterparts shall together constitute one and the same document.

José Salcedo ______________________ Date: 10/29/2015

José Salcedo, Unit Chief
Schools Unit – Sacramento Office
Brownfields and Environmental Restoration Program
Department of Toxic Substances Control

Matthew Zito ______________________ Date: 10/20/2015

Matthew Zito, Chief Facilities Officer
Sequoia Union High School District

EXHIBITS

A - SITE LOCATION MAP

B - SITE DIAGRAM

C - SCOPE OF WORK

D - PROJECT SCHEDULE

E - GUIDELINES FOR SUBMITTING DOCUMENTS IN ADOBE PORTABLE DOCUMENT FORMAT

F - COST ESTIMATE

EXHIBIT A

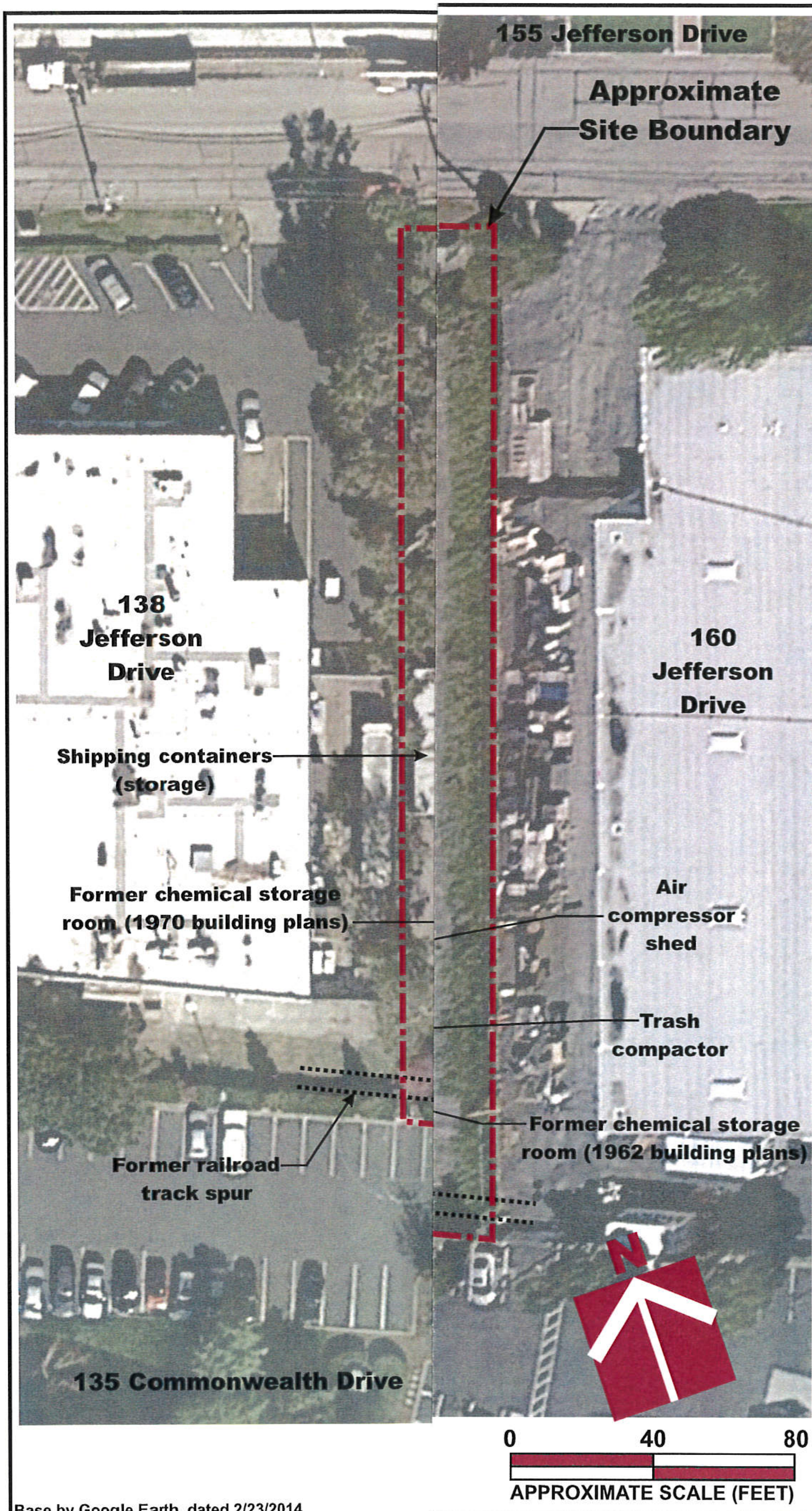
SITE LOCATION MAP

CORNERSTONE EARTH GROUP

Vicinity Map	Project Number: 166-14-1
150 Jefferson Drive Menlo Park, CA	Figure Number: Figure 1
	Date: November 2014 — Drawn By: RRN

EXHIBIT B

SITE DIAGRAM



Project Number 166-14-1

Figure Number Figure 2

Date November 2014

Drawn By RRN

Site Plan

150 Jefferson Drive
Menlo Park, CA

CORNERSTONE EARTH GROUP

EXHIBIT C

SCOPE OF WORK

EXHIBIT C

SCOPE OF WORK

The following Tasks will be completed as part of this Agreement. If circumstances warrant, the Proponent, with DTSC's prior written concurrence, may streamline certain tasks.

TASK 1. Submittal of Existing Data

The Proponent shall submit to DTSC, if relevant and available, all background information, sample analysis results, environmental assessment reports, and any other information pertinent to the hazardous materials management and/or release, characterization and cleanup of the Site not previously submitted as part of the Phase I Environmental Assessment (Phase I) and/or Phase I Addendum reviewed by DTSC. DTSC will review the information, and, in coordination with the Proponent, identify areas and compounds of concern, and determine the additional activities, if any, required to complete the investigation/remediation of the Site.

TASK 2. Scoping Meeting

DTSC's project manager will schedule a scoping meeting with the Proponent and the project coordinator within 15 days of Agreement execution. During the scoping meeting, the project coordinator shall present the proposed scope of work, including a summary of the historical and current onsite land uses, the uses of the adjacent properties, potential areas and compounds of concern, proposed sampling strategy and analytical methods, and timeframe for completion of each task. DTSC will provide recommendations, as needed, and request workplans or reports, as appropriate.

TASK 3. Preliminary Endangerment Assessment (PEA)

The Proponent shall conduct a PEA to determine whether a release or threatened release of hazardous materials exists at the Site, or whether naturally occurring hazardous materials are present, which pose a threat to children's health, children's learning abilities, public health or the environment. The PEA shall be conducted in accordance with the DTSC guidance manual for evaluating hazardous substance release sites, titled: "Preliminary Endangerment Assessment Guidance Manual," State of California, Environmental Protection Agency, Department of Toxic Substances Control (January 1994; revised June 1999).

Documents or activities which will be required as part of the PEA include:

3.1 PEA Workplan: The PEA Workplan shall include a sampling plan designed to determine the presence of contamination or naturally occurring hazardous materials at the Site, and, if present, the type and extent of the materials or contamination; a Health and Safety (HAS) Plan addressing health and safety issues and safe work practices (as described in Task 4); a Quality Assurance/Quality Control (QA/QC) Plan to produce data of known quality (as described in Task 5); and implementation schedule. DTSC will review and comment or approve the PEA Work Plan.

3.2 PEA Fieldwork Notice: The Proponent shall provide a PEA Fieldwork Notice to residents in the immediate area of the proposed school Site, utilizing a format developed by DTSC, prior to the commencement of PEA fieldwork pursuant to Education Code section 17210.1(b).

3.3 Implementation of Approved PEA Workplan: The Proponent shall begin implementation of the approved PEA Workplan in accordance with the approved implementation schedule. DTSC shall provide oversight and approval of PEA Workplan implementation, as appropriate.

3.4 Draft PEA Report: The draft PEA Report shall document whether a release has occurred or a threatened release exists, or whether naturally occurring hazardous materials are present, the threat the Site poses to children's health, children's learning abilities, public health and the environment, and whether further action is necessary. DTSC will review the draft PEA Report and provide written comments to the Proponent. The Proponent shall revise the PEA Report accordingly.

3.5 PEA Public Review Requirements: The Proponent shall comply with the public review requirements set forth in Education Code section 17213.1(a)(6) for the draft PEA Report. Comments pertaining to the draft PEA Report shall be submitted to DTSC within 14 days of the close of the required public review period and public hearing. The Proponent shall incorporate public comments received, as applicable, and finalize the PEA Report.

3.6 Final PEA Report: After consideration of all comments received on the PEA Report, DTSC will approve or disapprove the final PEA Report.

TASK 4. Health and Safety (HAS) Plan

The Proponent shall submit a Site-specific HAS Plan in accordance with California Code of Regulations, title 8, section 5192 and DTSC guidance, which covers all measures, including contingency plans, which shall be taken during field activities to protect the health and safety of the workers at the Site and the general public from exposure to hazardous waste, substances or materials. The HAS Plan should describe the specific personnel, procedures and equipment to be utilized.

TASK 5. Quality Assurance/Quality Control (QA/QC) Plan

All sampling and analysis conducted by the Proponent under this Agreement shall be performed in accordance with a QA/QC Plan submitted by the Proponent and approved by DTSC. The QA/QC Plan shall describe:

(a) The procedures for the collection, identification, preservation and transport of samples;

(b) The calibration and maintenance of instruments;

(c) The processing, verification, storage and reporting of data, including chain of custody procedures and identification of qualified person(s) conducting the sampling and of a laboratory certified or approved by DTSC pursuant to Health and Safety Code section 25198; and

(d) How the data obtained pursuant to this Agreement will be managed and preserved in accordance with Paragraph 3.16, Preservation of Documentation, of this Agreement.

EXHIBIT D

PROJECT SCHEDULE

EXHIBIT D

PROJECT SCHEDULE

TASK	TIMELINE
Proponent to submit advance payment	Within 10 days of Agreement execution
Proponent to submit existing data and reports	Within 15 days of Agreement execution
A scoping meeting to plan and coordinate project activities	Within 15 days of Agreement execution
Proponent to submit PEA Workplan	Within 30 days of Agreement execution
DTSC to review and comment or approve PEA Workplan	Within 30 days of receipt of PEA Workplan
Proponent to mail out PEA Fieldwork Notice to residents nearby the Site	7-14 days prior to commencement of PEA fieldwork
Proponent to implement PEA Workplan	As outlined in PEA Workplan
Proponent to submit PEA Report	As outlined in PEA Workplan
Proponent to hold a public review period and a public hearing for PEA report	In compliance with California Education Code section 17213.1(a)(6)
DTSC to review, comment and approve or disapprove PEA Report	In compliance with California Education Code section 17213.1(a)(6)

EXHIBIT E

GUIDELINES FOR SUBMITTING DOCUMENTS IN ADOBE PORTABLE DOCUMENT FORMAT

EXHIBIT E

Guidelines for Submitting PDF Documents to DTSC

With the DTSC Cleanup Program's database, EnviroStor, the public can now download and view project-related documents online. To provide the public with this vital source of information, please provide a PDF copy of documents, even if a hard copy will be supplied.

Due to differences in internet downloading capabilities and resolutions of PDF files, many users have problems uploading and downloading PDF files. Most often the problem is caused by files being saved at unnecessary large sizes. The following guidelines were created to provide consistency in PDF files and allow most users to access these files from EnviroStor.

1) File size: For each file that needs to be uploaded, the maximum file size should be kept to **30 megabytes** (MB). If you have a large file, please save large color images (e.g., figures, site photos, maps) and supplemental information (appendices) into separate PDF files.

2) Resolution for scanned files: For files being scanned from a scanner, the resolution or DPI setting should be no more than **200 DPI.**

3) Saving and Naming PDF files: If you make any changes to a PDF file, always use the Save As option instead of the Save option when saving. This will produce a smaller file size. It is recommended that the files be named by using an abbreviated site name, report title, date, and, if multiple files are being uploaded, the section of report (e.g., **Site_report_mmddyy_section**, 968-81stAve_PEA_072706_text).

4) Accessibility: To ensure that all files uploaded into EnviroStor are searchable and comply with California's Web Accessibility law, please run all PDF files through an Optical Character Recognition (OCR) process prior to submitting the file to DTSC.

5) Bookmarks: For large reports, bookmarks should be created in the PDF for ease of navigation.

EXHIBIT F

COST ESTIMATE

EXHIBIT F

COST ESTIMATE WORKSHEET

ENVIRONMENTAL OVERSIGHT AGREEMENT

District Name: Sequoia Union High School District

Project Name: Menlo Park Proposed School

Site Code: 204273-11

Title	EOA Coordinator	Project Manager		Unit Chief		Performance Manager		Tox	Geo	IH	PPS	CEQA	Legal	Clerical
TASK\CLASSIFICATION	SSA	HSS	HSE	HSEI	SEG			Staff Tox.	Eng. Geo.	Assoc. IH	PPS	AEP	Attorney	OT
Agreement Preparation/Negotiation	5		2											
Background Review			6					4						
Site Visit										2				
Preliminary Environmental Assesment (PEA)														
- PEA Scoping Meeting			10	2				4						
- PEA Workplan or Tech Memo			16					8	2					2
- PEA Fieldwork Oversight			10											
- PEA Report			18	1				8	2					2
- Project Closeout (CRU Memo, E-stor Completeness)			8	2										1
Estimated hours reflect time for review draft and any revisions needed, comment letters (as necessary) and/or approval letter.														
Supplemental Site Investigation (SSI)														
- SSI Workplan								12						
- SSI Fieldwork Oversight														
- SSI Report				2				8						
Estimated hours reflect time for review draft and any revisions needed, comment letters (as necessary) and/or approval letter.														
PPS														
Total No. Hours/Class	5	0	70	7	0			44	4	2	0	0	0	5
Hourly Rate/Class	104		194	240				179	195	152	125	132	185	76
Cost/Class	520	0	13580	1680	0			7876	780	304	0		0	380
Grand Total Cost	$25,120													

Tox - Toxicologist; Geo - Geologist; IH - Industrial Hygenist; PPS - Public Participation Specialist, CEQA - California Environmental Quality Act

* Hourly rates are revised annually and subject to change, Rates for **FY15-16**

* Hourly rates include indirect labor costs

APPENDIX G2:

DECEMBER 12, 2014 SOIL, SOIL VAPOR AND GROUND WATER INVESTIGATION

CORNERSTONE
EARTH GROUP

Type of Services	**Soil, Soil Vapor and Ground Water Quality Evaluation**
Location	**150 Jefferson Drive Menlo Park, California**
Client	**Sequoia Union High School District**
Client Address	**480 James Avenue Redwood City, CA 94062**
Project Number	**166-14-2**
Date	**December 12, 2014**

Kurt M. Soenen, P.E.
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
KURT M. SOENEN
63615
EXP. 9/30/16
CIVIL
STATE OF CALIFORNIA

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Type of Services	**Soil, Soil Vapor and Ground Water Quality Evaluation**
Location	**150 Jefferson Drive Menlo Park, California**

SECTION 1: INTRODUCTION

This report presents the results of the Soil, Soil Vapor, and Ground Water Quality Evaluation performed at 150 Jefferson Drive in Menlo Park, California (Site) as shown on Figures 1 and 2. This work was performed for Sequoia Union High School District (District) in accordance with our November 10, 2014 Agreement (Agreement).

1.1 SITE DESCRIPTION

The approximately 2.17-acre property is located at 150 Jefferson Drive in Menlo Park (Site) and is currently occupied with an asphalt pavement parking lot and warehouse building. The Site is located in a commercial area and is bound to the north by Jefferson Drive. A 43,986 square-foot structure exists on the Site and is occupied by Bay Associates Wire Technologies. The majority of the building is used for manufacturing of custom cable and wire products with the northern portion utilized for administrative office space. The wire manufacturing building work floor is raised approximately 4 feet to accommodate the truck-loading bays along the eastern portion of the building. We understand the District is considering purchasing the property for school use.

1.2 SITE HISTORY

Based on Cornerstone's Phase I Environmental Site Assessment ESA dated November 5, 2014, the Site appears to have been undeveloped land until construction of the existing building in approximately 1962. Building plans from 1962 indicate that the building was constructed for Bucal, Inc., however, it is not known if Bucal, Inc. ever occupied the building. Scientific Products, a division of American Hospital Supply Corporation, is listed in city directories as an occupant of the building between at least 1963 and 1975. Jonker Business Machines (along with Scientific Products) also was identified as an occupant in a 1970 city directory. Bay Associates Wire Technologies, the current occupant, appears to have occupied the building since the late 1970s or early 1980s. Bay Associates uses the on-Site building for manufacturing of wire products and associated administrative office purposes (Cornerstone, 2014).

1.3 BACKGROUND

Provided below is a summary of potential environmental concerns identified at the Site. Please refer directly to our Phase I ESA for a more complete overview of the Site and our conclusions and recommendations.

- Current hazardous materials used at the Site by Bay Associates consist mainly of methyl ethyl ketone (MEK), tetrahydrofuran (THF), isopropyl alcohol (IPA) and solvent based marking inks. These materials are stored within metal flammable materials storage cabinets. Hydraulic fluid, EDM dielectric oil, EnSolv (n-propyl bromide) and cutting fluids (way oil) also were observed at the Site. Hazardous wastes are stored within a canopy-covered and fenced enclosure located along the southern exterior side of the building. No documentation was provided regarding the types of hazardous materials used by Bay Associates prior to 1997.

  Details regarding hazardous materials use by occupants prior to Bay Associates were not identified within the data sources researched during the Phase I ESA. However, building plans from 1962 show a chemical storage room with explosion proof fixtures within the southeast corner of the building. This chemical storage room and associated fixtures were relocated to the southwest corner of the building in 1970. The presence of the former chemical storage rooms suggests that activities by prior occupants involved the use of hazardous materials. Prior to acquiring the Site for development as a school, we recommended sampling and laboratory analyses be conducted to evaluate soil, soil vapor and ground water quality at the Site.

- Based on the data reviewed, the Site appears to be located within an area where volatile organic compounds (VOCs) from an unidentified source are present in ground water. Perchloroethene (PCE) and Trichloroethene (TCE) concentrations have been reported in ground water at adjacent properties at concentrations that exceed its drinking water Maximum Contaminant Level (MCL) of 5 micrograms per liter (5 µg/L). Additional information pertaining to the regional solvent plume is presented in Section 1.2

  The United States Environmental Protection Agency (EPA) recommends further evaluation of potential vapor intrusion concerns for buildings overlying PCE/TCE impacted ground water that exceed 5 µg/L. Vapor intrusion generally occurs when there is a migration of volatile chemicals from contaminated ground water or soil into an overlying building. Volatile chemicals such as PCE and TCE can emit vapors that may migrate as vapors through subsurface soils and into indoor air spaces of overlying buildings.

  Prior to school occupancy, a regulatory agency likely would require soil, soil vapor, and ground water sampling to help evaluate if the Site has been impacted by releases from nearby facilities and/or if the Site is a potential source of VOC contamination. Additionally, an evaluation of potential vapor intrusion concerns and human health risks to future students and faculty also likely would be required. We recommended performing this work prior to property acquisition.

- A railroad track spur historically extended onto the southern portion of the Site. The former railroad tracks and wooden ties appear to have been removed. Assorted chemicals historically were commonly used for dust suppression and weed control along rail lines. We recommended evaluating soil quality along the former railroad track location.

- Based on our review of geologic maps, the Site is located approximately 4½ miles from the nearest ultramafic rock outcrop that may contain naturally occurring asbestos (NOA). In our opinion, there is a low probability that significant concentrations of NOA are present in native soils at the Site; however, California Department of Toxic Substances

Control (DTSC) Schools Division likely would require soil sampling if they were overseeing this project. We recommended collecting and analyzing soil samples for percent asbestos content in the areas where grading activities are planned for the proposed school development.

1.2 REGIONAL VOC GROUND WATER PLUME

Based on the information sources reviewed during Cornerstone's Phase I ESA, the Site appears located in an area where chlorinated VOCs from an unidentified source are present in ground water. A responsible party has not yet been identified by the regulatory agencies. Provided below is a summary of prior environmental studies performed on nearby properties where chlorinated VOCs in ground water have been reported.

A former warehouse building on the 149 Commonwealth Drive property (see Figure 2) reportedly was used exclusively for liquor storage and office space. In 1987, two ground water monitoring wells (MW-1 and MW-2) were installed on the 149 Commonwealth Drive property. VOCs, predominantly TCE at 630 micrograms per liter (µg/L), were detected in ground water from well MW-2 located on the northeast portion of the property. Beta Associates (1987) subsequently installed four additional ground water monitoring wells (MW-3 to MW-6). TCE was reported at up to 925 µg/L, predominantly in MW-2 and MW-6; well MW-6 was located on the adjacent property east of MW-2. Beta Associates concluded that, based on the data and knowledge of the property history, the VOC contamination appears to originate from an off-property source.

During the late 1980s and early 1990s, TCE was detected at up to 2,300 µg/L (in MW-6) during subsequent sampling of ground water from the wells. During these sampling events, a southeasterly ground water flow direction was reported. However, general regional ground water flow towards the north to northeast is anticipated.

In October 1998, the San Francisco Bay Regional Water Quality Control Board (Water Board) issued a no further action letter for the 149 Commonwealth Drive property that stated the following: *Groundwater monitoring data over the past seven years has indicated the presence of low levels of VOCs in shallow groundwater. Board staff agree that these chemicals most likely originate from an up gradient and off-site source. Concentrations of these compounds have decreased significantly within this period of time and currently only TCE is detectable in one well, MW-2, at a concentration of 5.3 µg/L. Additionally, the concentration of pollutants currently detected in groundwater beneath the property, whether they be from on- or off-site, do not represent a significant threat to water quality. Based on the information presented to the Board, and with the provision that the information provided to this agency was accurate and representative of site conditions, no further actions are required on the subject property.*

The San Mateo County Department of Environmental Health (DEH) files also contained a proposal prepared by EMCON in 1990 for the installation of ground water monitoring wells at 155 Jefferson Drive (located across Jefferson Drive to the northeast of the Site; see Figure 2). EMCON noted that four soil borings were previously drilled along the perimeter of the 155 Jefferson Drive property and soil and ground water were sampled. The samples reportedly were analyzed for chlorinated VOCs and aromatic VOCs. Chlorinated VOCs reportedly were detected in the ground water from three of the four borings; the laboratory results were not described. EMCON stated that the property is in an area of Menlo Park that has ground water contamination known to exceed California drinking water MCLs for VOCs and that the source of ground water contamination is unknown.

The DEH files also contained a Water Board no further action letter for 141 Jefferson Drive, located across Jefferson Drive from the Site (see Figure 2). The letter states that low levels of VOCs were detected in ground water at 141 Jefferson Drive, including PCE at 11 μg/L, cis-1,2-dichloroethene (DCE) at 33 μg/L and Freon 113 at 8 μg/L.

1.3 PURPOSE

The purpose of this Soil, Soil Vapor, and Ground Water Quality Evaluation was to evaluate the potential environmental concerns summarized above.

1.4 SCOPE OF WORK

As presented in our Agreement, the scope of work performed for this investigation included the following:

- Preparing and submitting permit applications to San Mateo County DEH;
- Drilling and logging of eighteen (18) exploratory borings to depths of up to 25 feet;
- Installation of eight (8) sub-slab vapor probes beneath the concrete floor slab;
- Installation of eight (8) subsurface vapor probes at approximately 5 feet;
- Collection of twenty three (23) soil samples from the exploratory borings for laboratory analyses;
- Collection of eight (8) ground water samples from the exploratory borings for laboratory analyses;
- Collection of eight (8) sub-slab and eight (8) subsurface soil vapor samples from vapor probes for laboratory analyses;
- Collection of one (1) ambient outdoor air sample for laboratory analysis, and;
- Preparation of this report.

The limitations for this investigation are presented in Section 5.

SECTION 2: SOIL, SOIL VAPOR, AND GROUND WATER QUALITY EVALUATION

2.1 PRE-FIELD ACTIVITIES

Prior to starting field work, a subsurface drilling permit application was obtained from San Mateo County DEH. A copy of the approved permit is included in Appendix A.

2.2 SUBSURFACE INVESTIGATION

Cornerstone performed subsurface investigation activities on November 20, and November 21, 2014. Eighteen (18) exploratory borings were advanced to approximate depths ranging from 5 to 25 feet using a track-mounted drill rig equipped with Direct Push Technology.

Soil borings (SB-1 through SB-8) were advanced approximately 5 feet into the first ground water yielding zone, observed in the borings at approximate depths of 11 to 16 feet below the asphalt pavement grade. Boring SB-1 was drilled near the existing exterior hazardous waste storage area; borings SB-2 and SB-3 were drilled near the reported former chemical storage rooms shown on 1962 and 1970 building plans; boring SB-4 was advanced at a central location inside the building where manufacturing activities are performed; borings SB-5 to SB-8 were drilled in accessible exterior locations near the north, south, east, and west property boundaries. Borings SB-9 and SB-10 were advanced to approximately 5 feet in the approximate area of the former rail spur alignment.

To help evaluate if vapor intrusion is a potential concern for future school use, subsurface borings (SV-1 through SV-8) were advanced to approximate depths ranging from 5 to 10 feet below elevated concrete building slab. Borings SV-2 and SV-3 were drilled within the reported former chemical storage rooms shown on 1962 and 1970 building plans; borings SV-1 and SV-4 to SV-7 were drilled in accessible interior locations where manufacturing activities are performed; and boring SV-8 was drilled within the administrative office space. Borings SV-2, SV-3, and SV-7 were advanced to an approximate depth of 10 feet below the elevated concrete floor slab (approximately 5 feet into native soil). Approximate boring locations are shown on Figure 2.

The subsurface exploration program was performed using Direct Push technology equipped with the Dual Wall Sampling System. The Dual Wall Sampling System helps prevent cross contamination between sampling intervals. The Dual Wall Sampler is comprised of two main components: an exterior steel casing and an inner sample barrel. The outer casing has a 2-inch outer diameter (OD) and a 1.5-inch inner diameter (ID). The sample barrel is 5 feet in length with a 1.375-inch outside diameter (OD) and a 1-inch inner diameter (ID). The Dual Wall sample barrel is loaded with a 5-foot acetate liner and installed inside the outer casing. The outer drive casing and inner sample barrel are then hydraulically pushed to a depth of approximately 5 feet. As these tools are advanced, the inner sampling barrel collects the soil core sample. This sampler is then retrieved while the outer casing remains in place, protecting the integrity of the hole. A new sampler is lowered into place and advanced another 5 feet to collect the next soil sample. This process continues until a desired depth has been reached. Our field engineer continuously logged the borings in general accordance with the Unified Soil Classification System (ASTM D-2487). All borings were tremie grouted upon completion in accordance with the San Mateo County DEH permit requirements.

2.2.1 Subsurface Materials Observed

The concrete slab section for the existing raised wire manufacturing building consisted of approximately 5 to 11 inches of concrete over approximately 4 feet of fill. The fill consists of varying amount of clay, sand, and gravel.The northern at-grade administrative office space consisted of approximately 6 inches of concrete over 3 inches of sand and 3 inches of coarse gravel fill followed by approximately 1½ feet of fill consisting of sandy clay with gravel. Exterior surface pavements generally consisted of 3 to 4 inches of asphalt concrete over approximately 3 inches of aggregate base. The existing pavements were in poor condition, with alligator cracking visible in several areas of the parking lot.

Native subsurface materials observed below fill and aggregate base consisted of several feet of very stiff to hard fat clay underlain by medium stiff to hard lean clay with varying amounts of sand. Increased sand and gravel content were observed at approximately 14 feet below the asphalt pavement grade at several boring locations; free ground water was observed in this layer. No soil discoloration was observed in the soil samples. Borings logs are included in Appendix A.

Ground water was observed at depths ranging from approximately 11 to 16 feet below the asphalt pavement surface. All measurements were taken at the time of drilling and may not represent the stabilized levels that can differ from the initial levels encountered.

2.2.2 Organic Vapor Readings

Soil samples were monitored with a MiniRAE 3000 Organic Vapor Meter (OVM) to record volatile hydrocarbon vapors. The soil was screened by drilling a small diameter hole in the acetate liner extending approximately ½ inch into the soil core. The OVM probe tip was then inserted into the created void space to record an OVM reading.

Organic vapor readings typical of background concentrations (less than 1 part per million vapor [ppm_v]) were recorded in boring SB-1, SB-2, SB-3, SB-4, and SB-7. Low OVM readings were recorded in the upper approximate 5 feet of soil collected from boring SB-3 (up to 1.8 ppm_v). OVM readings were measured up to 8.5 ppm_v at approximately 17 feet in boring SB-4 (center of manufacturing area). OVM readings are listed on the boring logs presented in Appendix A.

2.2.3 Soil Sample Collection and Laboratory Analyses

Soils samples were collected in clean acetate liners, covered in a Teflon film, fitted with plastic end caps, labeled with a unique sample identification number, and were submitted to a state-certified laboratory. Core-N'-One capsules (in triplicate) were used to sample and transport approximately 5 grams of undisturbed soil per capsule for volatile hydrocarbons analysis. Samples for laboratory analyses were placed in an ice-chilled cooler and transported to a state-certified laboratory with chain of custody documentation.

Based on field observations and OVM readings, nineteen (19) soil samples were collected from borings SB-1 through SB-10 and SV-1 through SV-8 for laboratory analyses. Eight soil samples (two samples per boring) were collected from SB-1 through SB-4; one sample was collected from the upper approximate 1-foot of soil below the concrete floor slab or asphalt and another deeper sample was collected from approximate depths varying between 5 and 10 feet. The eight soil samples from SB-1 through SB-4 (two per boring) were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPH-gasoline) and VOCs by EPA Test Method 8260B, and TPH-diesel and TPH-oil with a silica gel cleanup by EPA Test Method 8015M. The shallow soil samples collected from borings SB-1 through SB-4 were additionally analyzed for semi-VOCs (SVOCs) by EPA Test Method 8270, California Assessment Manual (CAM) 17 metals by EPA Test Method 6010B/7471A, and polychlorinated biphenyls (PCBs) by EPA Test Method 8082.

One soil sample was collected from borings SB-8 through SB-10 from the upper approximate 1 foot of soil. The three soil samples (one per boring) were analyzed for TPH-diesel and TPH-oil with a silica gel cleanup, polycyclic aromatic hydrocarbons (PAHs) by EPA Test Method 8270SIM, CAM 17 metals, organochlorine pesticides (OCPs) by EPA Test Method 8081, and PCBs.

Eight additional samples were collected from borings SV-1 through SV-8 to evaluate the quality of the fill. The eight soil samples (one per boring) were analyzed for halogenated VOCs by EPA Test Method 8260B. The fill sample from boring SV-8 was additionally analyzed for TPH-gasoline, TPH-diesel and TPH-oil with a silica gel cleanup, SVOCs, CAM 17 metals, and PCBs.

Additionally, five soil samples were collected from exploratory borings SB-4, SV-2, SV-7, and SV-8 (one sample per boring and two samples from SB-4) for asbestos testing using Transmission Electron Microscopy (TEM) quantitative methods with CARB 435 preparation techniques. These soil samples were collected from approximate depths varying from 1 to 7 feet.

2.2.4 Ground Water Collection and Laboratory Analyses

Ground water grab samples were collected from exploratory borings SB-1 to SB-8. At each location, polyvinyl chloride (PVC) slotted pipe was lowered into the boring to facilitate sample collection. Ground water grab samples were collected from each boring using a check valve and dedicated polyethylene tubing. New tubing was used at each sample location to eliminate the potential for cross contamination of samples.

The order of sample ground water container filling proceeded from most volatile to least volatile compounds. Ground water grab samples were collected in appropriate containers and labeled with the sample ID, project number, and date and time of collection. Samples were placed in an ice-chilled cooler and transported to a state-certified laboratory with chain of custody documentation. The grab ground water samples were analyzed for TPH-gasoline, VOCs, TPH-diesel and TPH-oil with a silica gel cleanup, and SVOCs.

2.3 SOIL VAPOR AND OUTDOOR AIR SAMPLING

Borings SV-1 to SV-8 were converted into temporary subsurface soil vapor probes. Temporary sub-slab probes were also installed near the SV-1 to SV-8 borings. The approximate location of the temporary vapor probes are shown on Figure 2.

The eight sub-slab probes were installed in the aggregate material beneath the concrete floor slab utilizing a drill and concrete rotary bit. An outer pilot boring was be advanced to partially penetrate the slab (7/8 inch in diameter by 3 inches in depth). Cuttings (concrete dust) were vacuumed during advancement. Then, a smaller diameter inner hole of 5/16 inch diameter was drilled with periodic vacuuming until final penetration of the concrete was achieved. Stainless steel chromatography grade tubing (5 to 6.75 inches in length) was utilized with the lower end suspended in the inner hole (not protruding through the bottom of the slab) and the upper end connected immediately above the slab via Swagelok ferrule compression fitting to a Swagelok shut off valve in the “off” position and affixed upper end cap. Non-shrinking cement was mixed according to the manufacturer’s instructions for flowable cement grout. The slurry flowed into place from the bottom to the top surrounding the fitting within the outer hole to become flush with the slab surface.

The eight subsurface soil vapor probes were installed by advancing an approximate 5 foot boring (SV-1, SV-4, SV-5, SV-6, and SV-8) or 10 foot boring (SV-2, SV-3, and SV-7) utilizing the limited access track-mounted drill rig equipped with Direct Push Technology. Each soil vapor probe consists of a stainless steel expendable vapor tip installed at an approximate depth of 4½ feet or 9½ feet and screen affixed to stainless steel tubing. The vapor sampling locations were constructed by first placing approximately 6 inches of coarse aquarium sand into the bottom of the borehole using a tremie pipe. The stainless steel tip and tubing was then lowered into the borehole via a tremie pipe. Additional sand was then placed in the borehole via tremie to create an approximately 1 foot sand pack interval around the vapor tip. Approximately 4 to 6 inches of dry granular bentonite (Benseal™) was placed on top of the sand pack via the tremie pipe, followed by minimum 4 inches of hydrated granular bentonite. Bentonite "gel" was placed via tremie pipe on top of the hydrated granular bentonite to the surface. The stainless tubing was labeled with depth of placement and capped utilizing a vapor tight Swagelok valve set in the "off" position. Soil vapor well construction logs are included in Appendix A.

2.3.1 Soil Vapor Sample Collection and Laboratory Analyses

On November 24 and November 25, 2014, our Professional Geologist, Ross Tinline, P.G., returned to the Site to perform the vapor sampling. The tubing emanating from the vapor points was affixed to a sample shut off valve in the "off" position during the time needed to reach equilibrium (at least 48 hours). A 167 milliliters-per-minute flow regulator inclusive of particulate filter was fitted to the shut off valve and the other end to a "T" fitting. One end of the "T" was connected to the sampling summa canister. The other end of the "T" 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 at least one pore volume was removed utilizing the purging summa. Purge volumes of vapor were removed and verified by the calculated pressure drop in the 1 liter summa canister utilized for purging. The purge volume was calculated based on the length and inner diameter of the sampling probe, the connected sampling tubing and equipment, and the borehole sand pack.

Isopropyl alcohol was utilized as a leak detection compound during sampling by applying 5 drops to cotton gauze and placing the moistened gauze near the borehole. Sampling began by opening the summa canister valve. Immediately upon opening the sampling valve, a shroud was placed over and enclosed the atmosphere of the borehole and entire sampling train including all connections.

Sampling continued until the vacuum gauge indicated approximately 5 inches of Hg remaining, with exception of the subsurface soil vapor samples collected from locations SV-2, SV-3, SV-7, and SV-8. The remaining vacuum pressure at these locations was approximately 25 inches of Hg, 28 inches of Hg, 26 inches of Hg, and 26 inches of Hg, respectively, and was attributed to stiff native clay at these locations/depths. A data logging photoionization detector (PID) was utilized during sampling to monitor the atmosphere inside the shroud through a bulkhead fitting. The logged data (at minimum thirty [30] second intervals) was corrected to parts per million by volume isopropyl alcohol concentrations and utilized to evaluate the integrity of the sampling train.

To confirm the isopropyl alcohol atmosphere, one confirmation sample was collected from the shroud atmosphere through the sampling port of the PID. The confirmation sample was collected using a summa connected to a flow controller within the shroud during sample collection. All field data, including equilibrium time, purge volume calculations and leak check measurements were recorded.

The eight (8) sub-slab and four subsurface soil vapor samples were analyzed for VOCs (EPA Test Method TO-15) and fixed gases carbon dioxide and oxygen (ASTM Method D-1946). In addition, one air sample collected from the shroud atmosphere was analyzed for isopropyl alcohol.

2.3.2 Temporary Vapor Probe Destruction

The temporary vapor probes were destroyed on December 12, 2014 by removing the tubing, bentonite seal, and sand pack and filling the borehole with neat cement grout up to ground surface.

2.3.3 Outdoor Air Sample Collection and Analyses

On November 25, 2014 an outdoor air sample (OA-1) was collected in a laboratory certified 6-liter summa canister equipped with an 8-hour flow controller. The canister was placed along the walkway near SB-5, west of the building. At the time of sampling, stainless steel tubing was installed on the canister to collect ambient air approximately 6 feet above the asphalt pavement surface. The outdoor air sample was analyzed for VOCs by EPA Test Method TO-15 SIM.

SECTION 3: SUMMARY OF ANALYTICAL DATA

3.1 ENVIRONMENTAL SCREENING LEVELS

Cornerstone compared detected soil contaminants of potential concern to residential Regional Screening Levels (RSLs)[1] established by USEPA Region 9 (USEPA, 2014), using a Hazard Quotient of 0.1. For detected chemicals for which RSLs have not been established, Environmental Screening Levels (ESLs) established by the San Francisco Bay Regional Water Quality Control Board (Water Board, 2013) were used for comparison. Total lead was compared to its residential CHHSL[2]. Metal concentrations were compared to natural background concentrations[3].

Detected contaminants in ground water were compared to Maximum Contaminant Levels (MCLs) established by State Water Resources Control Board (July 2014). For detected chemicals for which MCLs have not been established, Environmental Screening Levels (ESLs)

[1] Regional Screening Levels are used to screen sites for potential human health concerns where releases of chemicals to soil have occurred. They are risk-based concentrations derived from standardized equations combining exposure information assumptions with EPA toxicity data. RSLs are considered by the EPA to be protective for humans (including sensitive groups) over a lifetime; however, RSLs are not always applicable to a particular site and do not address non-human health endpoints, such as ecological impacts. The RSLs referenced in this report are generic; they are calculated without site-specific information. For non-carcinogenic compounds, the Hazard Quotient is the ratio of potential exposure to a substance and the level at which no adverse effects are expected. If the Hazard Quotient is calculated to be less than 1, then no adverse health effects are expected as a result of exposure. As a conservative comparison, the RSLs presented in this report for non-carcinogenic compounds are based on a Hazard Quotient of 0.1. Thus, for a single compound, raising the Hazard Quotient from 0.1 to 1 raises its respective RSL by an order of magnitude.

[2] California Human Health Screening Levels (CHHSLs, 2010) were developed by the California Environmental Protection Agency (CalEPA).

[3] Naturally occurring background concentrations of metals, such as arsenic, in soil may exceed their respective screening levels. CalEPA generally does not require cleanup of soil to below background concentrations. Thus, for the metals detected, these data also were compared to regional published background concentrations (Scott, 1991; Bradford, 1996; LBNL, 2009; and Duverge, 2011).

established by the San Francisco Bay Regional Water Quality Control Board (Water Board, 2013) were used for comparison.

CalEPA has not established environmental screening levels for comparison to sub-slab and subsurface soil vapor data. To evaluate potential vapor intrusion concerns, CalEPA recommends using the Department of Toxic Substances Control (DTSC) guidance document *Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* dated October 2011 (DTSC, 2011). The indoor air residential RSLs established by the USEPA were adjusted using the attenuation factors provided in the DTSC guidance. For this study, attenuation factors of 0.05 and 0.002 were used to calculate sub-slab and subsurface screening criterion, respectively. Additionally, TCE was compared to the "Prompt Response" indoor air action level established by the USEPA for evaluation of vapor intrusion concerns at South Bay National Priority List (NPL) sites (USEPA, 2013).

3.2 SUMMARY OF SOIL ANALYTICAL DATA

The analytical results of the soil samples are summarized below and in Tables 1 to 4 in the Tables section of this report. Chain of custody documentation and laboratory analytical datasheets are presented in Appendix B.

- The detected metal concentrations did not exceed their respective residential RSL and/or appeared within range of typical background.
- TPH-diesel was detected in 6 of 12 soil samples at concentrations up to 39 mg/kg. Its residential ESL is 100 mg/kg.
- TPH-oil was detected in 2 of 12 soil samples. One soil sample was detected above its residential ESL (100 mg/kg) at a concentration of 130 mg/kg (SB-1).
- With exception of Anthracene, no PAHs were detected in the three soil samples above their respective laboratory reporting limits. Anthracene was detected in 1 of 3 soil samples at a concentration of 0.005 mg/kg. Its residential RSL is 1,700 mg/kg.
- TPH-gasoline, VOCs, SVOCs, PCBs, OCPs, and asbestos were not detected above their respective laboratory reporting limits in the selected soil samples.

3.4 SUMMARY OF GROUND WATER ANALYTICAL DATA

The analytical results of the grab ground water samples are summarized below and in Table 5 in the Tables section of this report. Figure 3 presents TPH-diesel, TPH-oil, and 1,1-DCE analytical data. Chain of custody documentation and laboratory analytical datasheets are presented in Appendix B.

- TPH-diesel was detected in 3 of 8 ground water samples. Two ground water samples were detected above its residential ESL (100 µg/L) at a concentration of 230 µg/L (SB-3 and SB-8).
- TPH-oil was detected in 3 of 8 ground water samples. All three ground water samples were detected above its residential ESL (100 µg/L) at concentrations of 800 µg/L, 350 µg/L, and 1,000 µg/L (SB-3, SB-5, and SB-8, respectively).

- 1,1-Dichloroethene (1,1-DCE), a breakdown product of PCE and/or TCE, was detected in 4 of 8 grab ground water samples (SB-3, SB-4, SB-5, and SB-8) at concentrations up to 2.1 µg/L. Its drinking water MCL is 6 µg/L. No other VOCs were detected in the grab ground water samples.

- TPH-gasoline and SVOCs were not detected in the grab ground water samples above their respective laboratory reporting limits.

3.5 SUMMARY OF SOIL VAPOR AND OUTDOOR AIR ANALYTICAL DATA

The analytical results of the soil vapor and outdoor air samples are summarized below and in Table 6 in the Tables section of this report. Figure 4 presents soil vapor analytical data for selected compounds. Chain of custody documentation and laboratory analytical datasheets are presented in Appendix B.

- Benzene was not detected in the sub-slab soil vapor samples above the laboratory reporting limit. Benzene was detected in 8 of 8 subsurface soil vapor samples at concentrations ranging from 5 µg/m^3 (SV-1) to 220 µg/m^3 (SV-3). The concentration at SV-3 exceeds its calculated subsurface screening criterion of 180 µg/m^3.

- Chloroform was detected in 2 of 8 sub-slab soil vapor samples at concentrations of 5.5 µg/m^3 (SV-1) and 18 µg/m^3 (SV-5). These concentrations exceed its calculated sub-slab surface screening criterion of 2.4 µg/m^3. Chloroform was not detected in the subsurface soil vapor samples above the laboratory reporting limits.

- Toluene was not detected in the sub-slab soil vapor samples above the laboratory reporting limit. In the subsurface samples, toluene was detected in 7 of 8 samples at concentrations ranging from 12 µg/m^3 (SV-5) to 210 µg/m^3 (SV-3); however, these concentrations are below their respective subsurface screening criterion of 260,000 µg/m^3.

- Ethylbenzene was not detected in the sub-slab soil vapor samples above the laboratory reporting limit. In the subsurface vapor probes, ethylbenzene was detected in 5 of 8 samples at concentrations ranging from 6.4 µg/m^3 (SV-4) to 59 µg/m^3 (SV-3); however, these concentrations are below the subsurface screening criterion of 550 µg/m^3. Additionally, the outdoor air sample detected toluene at a concentration of 1.2 µg/m^3; its indoor air RSL is 520 µg/m^3.

- Cyclohexane was not detected in the sub-slab soil vapor samples above the laboratory reporting limit. In the subsurface samples, cyclohexane was detected in 8 of 8 samples at concentrations ranging from 4.4 µg/m^3 (SV-1) to 3,500 µg/m^3 (SV-3); however, these concentrations are below their respective subsurface screening criterion of 315,000 µg/m^3.

- Other VOCs were detected in the vapor samples including 1,2,4-trimethylbenzene, 2-butanone (MEK), 4-ethyl toluene, acetone, freon 113, heptane, hexane, m,p-xylene, o-xylene, tetrahydrofuran, 1,1,1-TCA, and ethanol. These detected compounds did not exceed their respective calculated screening criterion.

- Leak detection compound 2-proponal (also known as isopropanol or isopropyl alcohol) was detected in 8 of 8 sub-slab vapor samples (concentrations ranging from 12 µg/m^3 to 240 µg/m^3) and 2 of 8 subsurface soil vapor samples (concentrations of 54 µg/m^3 and 130 µg/m^3).

- Oxygen concentrations in the 16 vapor samples ranged from 8.1 percent to 20 percent with the lowest concentrations detected in the vapor samples collected from the subsurface soil vapor sample probe installed at location SV-1. Carbon dioxide levels ranged from 0.29 percent to 12 percent with the greatest concentrations detected in the SV-1 and SV-4 sub-slab soil vapor sample probes.

- Benzene was detected in the outdoor ambient air sample at a concentration of 0.47 µg/m^3, exceeding its indoor air residential RSL of 0.36 µg/m^3. Other VOCs were detected in including toluene, ethylbenzene, 2-Butanone (MEK), acetone, isopropanol, m,p-xylene, o-xylene, trichlorofluoromethane, and ethanol; however, none of the detected concentrations exceeded their respective indoor air RSL.

3.5.1 Soil Vapor Data Quality

During this investigation, one confirmation sample of the shroud atmosphere was collected from the exhaust port of the PID and into a 1-liter tedlar bag during sampling at sub-slab location SV-8. Laboratory analyses of the shroud atmosphere sample detected 2-propanol at 65,000 µg/m^3. During the same sampling time period, the shroud atmosphere was measured by the PID to range from approximately 49,000 µg/m^3 to 123,000 µg/m^3 with an average concentration of 82,000 µg/m^3. The PID appeared to slightly underestimate the shroud atmosphere.

The maximum 2-propanol detection in the soil vapor samples (240 µg/m^3 at sub-slab location SV-3) was used to estimate the leakage rate, if any. The average shroud concentration of 2-proponal measured with the datalogging PID during sampling at SV-3 was 128,000 µg/m^3. Based on this data, the maximum leakage rate was estimated to be less than 0.2 percent. This analysis indicates the sampling trains appeared sufficiently tight for representative soil vapor sample collection and no significant leakage occurred.

SECTION 4: CONCLUSIONS AND RECOMMENDATIONS

4.1 GENERAL SOIL QUALITY

During this investigation, fill and native soil samples were collected from the 18 exploratory borings and were analyzed for various organic and inorganic compounds including petroleum hydrocarbons, VOCs, PAHs, SVOCs, PCBs, organochlorine pesticides, metals, and/or asbestos. With exception to concentrations of TPH-oil detected in 2 of 12 soil samples at 77 mg/kg and 130 mg/kg (ESL is 100 mg/kg) and low concentrations (i.e., less than environmental screening criteria) of TPH-diesel (detected in 6 of 12 soil samples) and anthracene (detected in 1 of 3 soil samples), no analytes were detected above their respective laboratory reporting limit. The detected metal concentrations appear typical of natural background and/or less than their respective residential screening criteria.

Based on the limited soil data, soil quality at the locations sampled near the former rail spur line and fill soil placed at the site does not appear significantly impacted. Additionally, NOA does not appear to be a significant concern at the Site.

As noted, one soil sample collected from the boring advanced near the exterior hazardous waste storage area (SB-1) detected TPH-oil at 130 mg/kg. The extent of soil impacts near the SB-1 location are anticipated to be limited in extent. We recommend over-excavating the TPH-impacted soil that exceeds the residential Regional Screening Levels (RSL) for disposal at a landfill. Post-excavation confirmation soil sampling should also be performed.

4.2 GENERAL GROUND WATER QUALITY

Laboratory analyses of the grab ground water samples collected from the exploratory borings did not detect semi-VOCs, BTEX compounds, TPH-gasoline, fuel oxygenates and/or other VOCs above their respective laboratory reporting limits except for 1,1-DCE and TPH-diesel/oil. 1,1-DCE was detected in 4 of 8 grab ground water samples at concentrations ranging from 1.2 µg/L to 2.1 µg/L; its drinking water MCL is 6 µg/L. As shown on Figure 3, the 1,1-DCE detections were found in the grab ground water samples collected from the borings advanced along a hypothetical line extending from the approximate northwest corner to southeast corner of the property (SB-5, SB-4, SB-3, and SB-8). The source of 1,1-DCE detected in the grab ground water samples is not known but is likely associated with the ground water solvent plume reported in the regional area. 1,1-DCE is a breakdown product of PCE, TCE and cis-1,2-DCE; these compounds have been detected on properties north and south of the Site. Regulatory agencies have not identified a responsible party for the solvent release(s).

TPH-oil was detected in 3 of 8 grab ground water samples at concentrations of 350 µg/L, 800 µg/L, and 1,000 µg/L, respectively. A drinking water MCL has not been established for TPH-oil. Thus, the San Francisco Bay Regional Water Quality Control Board (Water Board) Environmental Screening Level (ESL) of 100 µg/L was used for comparison. The greatest concentrations were detected from the two borings advanced near the southeast corner of the Site (SB-3 and SB-8); TPH-diesel also slightly exceeded its ESL of 100 µg/L in these two samples. Note that only low to non-detectable concentrations of TPH-diesel/oil were reported in the three soil samples collected from the upper approximate 10 feet from borings SB-3 and SB-8. This data indicates a significant soil source likely does not exist at these locations.

The source of the TPH-impacted ground water is not known but may be associated with possible localized minor spills/releases and/or associated with an off-Site release. Following building demolition, if pockets of petroleum contaminated soil are observed, they shall be evaluated and removed for appropriate off-site disposal. Regional ground water flow is assumed to be in the north-northeast direction toward the San Francisco Bay; however, variable flow directions have been reported. Moderate and heavy-range petroleum hydrocarbons are relatively immobile in the environment and typically are limited in extent. The TPH-impacted ground water would be expected to degrade over time due to natural attenuation processes. These impacts do not appear to pose a significant risk to human health in a school setting.

5.3 GENERAL SOIL VAPOR AND OUTDOOR AIR QUALITY

To assist in evaluating potential vapor intrusion concerns, co-located sub-slab and subsurface soil vapor samples were collected at eight locations inside the on-Site building. The sub-slab samples were collected in the aggregate material immediately below the concrete floor slab. The subsurface samples were collected from approximate depths of 5 or 10 feet. An outdoor ambient air sample was also collected to assist in evaluating outdoor air quality.

Laboratory analyses of the eight sub-slab and eight subsurface soil vapor samples detected several VOCs; however, none of the chlorinated VOCs associated with the regional solvent plume (i.e., PCE/TCE and their breakdown products) were detected above their respective laboratory reporting limits.

Following CalEPA and DTSC guidance, the detected VOCs were compared to calculated sub-slab and subsurface screening criterion that are 20 times (attenuation factor = 0.05) and 500 times (attenuation factor = 0.002) the indoor air RSL, respectively. For example, the residential (unrestricted use) indoor air RSL for benzene is 0.36 µg/m^3. The calculated sub-slab and subsurface screening levels for benzene are 7.2 µg/m^3 and 180 µg/m^3, respectively. As shown in Table 6, none of the detected VOCs exceeded their respective calculated environmental screening criteria with exception of benzene and chloroform.

Benzene concentrations in the eight subsurface soil vapor samples ranged from 5 to 220 µg/m^3 with one sample exceeding its calculated screening level of 180 µg/m^3. The elevated benzene concentration was reported in the soil vapor sample collected from an approximate depth of 10 feet below the elevated concrete floor slab at location SV-3. Benzene was not detected above its laboratory reporting limit in the eight sub-slab soil vapor samples. As noted above, benzene also was not detected in the eight grab ground water samples and selected soil samples collected at the Site, including from nearby boring SB-3.

The source of benzene detected in the subsurface soil vapor samples is not known; however, based on the available data and comparison to the selected screening criteria used by DTSC, the elevated benzene concentrations in soil vapor do not appear to be a Site-wide concern. Additionally, oxygen concentrations in the sub-slab vapor samples ranged from 16 to 20 percent and may explain why benzene was not detected above its laboratory reporting limit in the sub-slab samples. Petroleum hydrocarbon vapors will naturally degrade in an aerobic environment thus reducing the potential for petroleum hydrocarbon vapor intrusion concerns.

Chloroform was detected in 2 of 8 sub-slab soil vapor samples at concentrations of 5.5 µg/m^3 (SV-1) and 18 µg/m^3 (SV-5); its calculated screening level is 2.4 µg/m^3. Chloroform was not detected above its laboratory reporting limit in the eight subsurface soil vapor samples. Similar to benzene, chloroform also was not detected in the eight grab ground water samples and selected soil samples collected at the Site, including the soil samples collected from the SV-1 and SV-5 borings. The source of the chloroform detected in the subsurface vapor samples is not known but may be associated with indoor air contamination inside the building associated with the existing manufacturing operations. Ambient barometric pressure forces can transfer indoor air across the floor slab via cracks and/or penetrations and into underlying soil. This natural process may also explain the occurrence of other VOCs detected at low concentrations in the soil vapor samples.

4.4 GENERAL CONCLUSIONS AND RECOMMENDATIONS

Based on the data obtained during this investigation, the Site does not appear to be a source of the ground water solvent contamination reported in the regional area. The occurrence of low concentrations of 1,1-DCE in some of the grab ground water samples collected at the Site likely is attributed to ground water impacts that originated from an off-Site unknown source. In an effort to identify the source of the regional contamination and/or a responsible party, the District should understand that a regulatory agency could require property access to perform additional sampling at the Site (e.g. installation of monitoring wells to evaluate ground water quality and flow direction).

Laboratory analyses of the soil, soil vapor, and ground water samples do not indicate that vapor intrusion is a significant concern at the Site; however, regulatory agencies typically require multiple sampling events to help evaluate seasonal and temporal variation associated with the vapor intrusion pathway. If the current building will remain for school use, we recommend sealing all penetrations and/or cracks in the floor slab. Prior to occupancy, we also recommend performing indoor air sampling and another round of soil vapor sampling to help evaluate if vapor mitigation measures may be required. If new building construction is planned, for a higher level of protection, we recommend consideration be given to installing a vapor barrier system.

Based on the reported outdoor air data and the Site's general location in a commercial/industrial setting, we recommend consulting with a qualified heating, ventilation, and air conditioning (HVAC) professional to help design the building ventilation system for school occupancy. Additionally, the HVAC system should be operated under positive pressure to help limit the driving force for vapor intrusion.

As required by the drilling permit, analytical results from this investigation must be forwarded to San Mateo County DEH. DEH staff will review the analytical data and make a determination if the Site should be opened as a contamination case and/or forwarded to another agency. We recommend forwarding the complete Soil, Soil Vapor, and Ground Water Quality Evaluation report to DEH and request they provide a response prior to the District acquiring the property.

At the time manufacturing activities are discontinued, facility closure activities should be coordinated with the DEH. A closure plan is typically required that describes required closure activities, such as cleaning of equipment that contains hazardous materials, decontamination of building surfaces, confirmation sampling protocols, equipment removal and waste disposal practices, among others. We recommended that a copy of the closure plan be provided for review by Cornerstone, and that appropriate facility closure activities be completed prior to use of the Site as a school.

SECTION 5: LIMITATIONS

Cornerstone performed this investigation to support Sequoia Union High School District in evaluation of soil, soil vapor, and ground water quality beneath the Site. Sequoia Union High School District understands that the extent of soil, soil vapor and ground water data obtained is based on the reasonable limits of time and budgetary constraints. In addition, the chemical information presented in this report can change over time and is only valid at the time of this investigation and for the locations sampled.

This report, an instrument of professional service, was prepared for the sole use of Sequoia Union High School District and may not be reproduced or distributed without written authorization from Cornerstone.

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.

SECTION 6: REFERENCES

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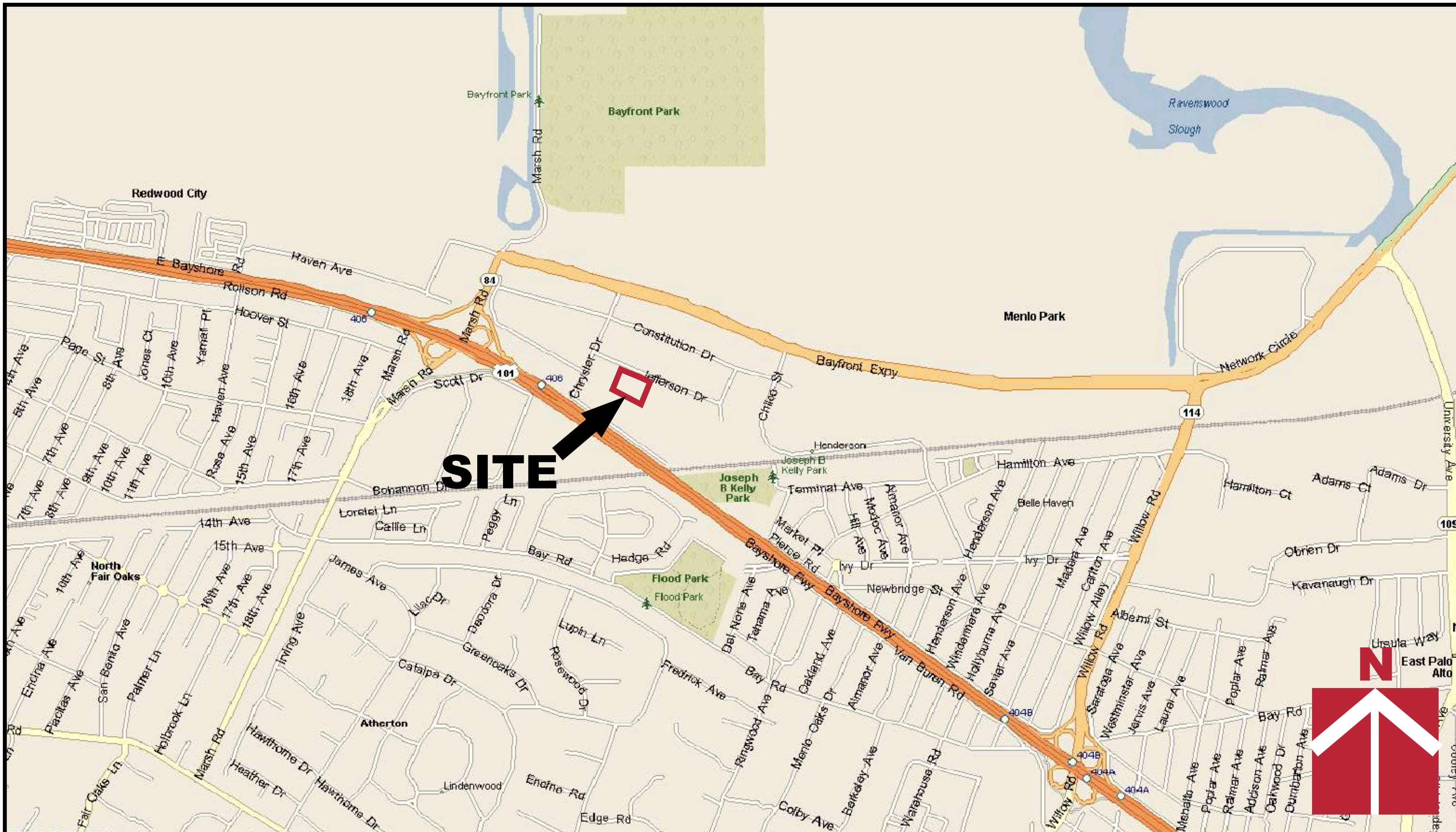
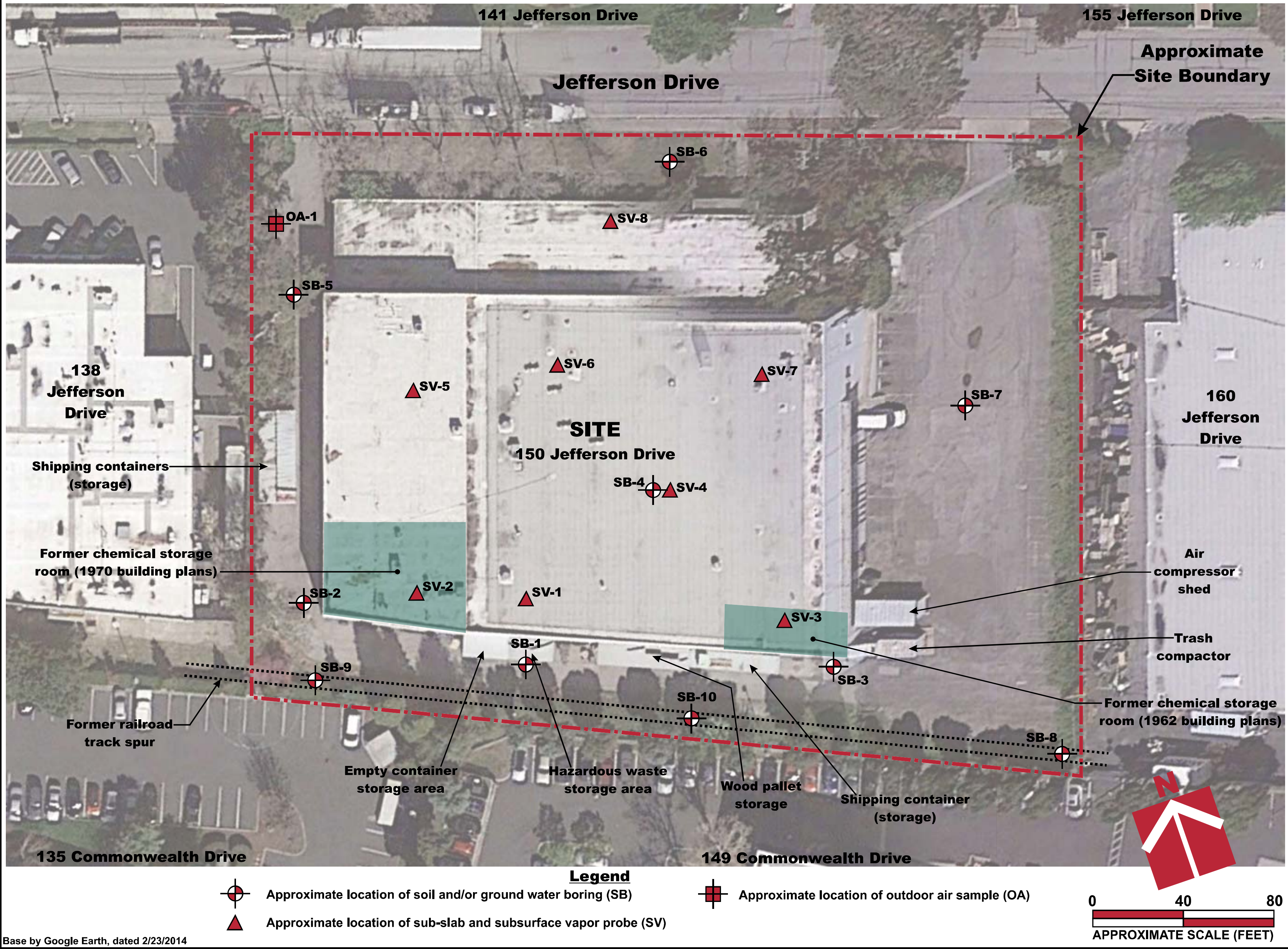


Vicinity Map

150 Jefferson Drive
Menlo Park, CA

CORNERSTONE EARTH GROUP

Project Number	166-14-1
Figure Number	Figure 1
Date	November 2014
Drawn By	RRN



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Sampling Locations

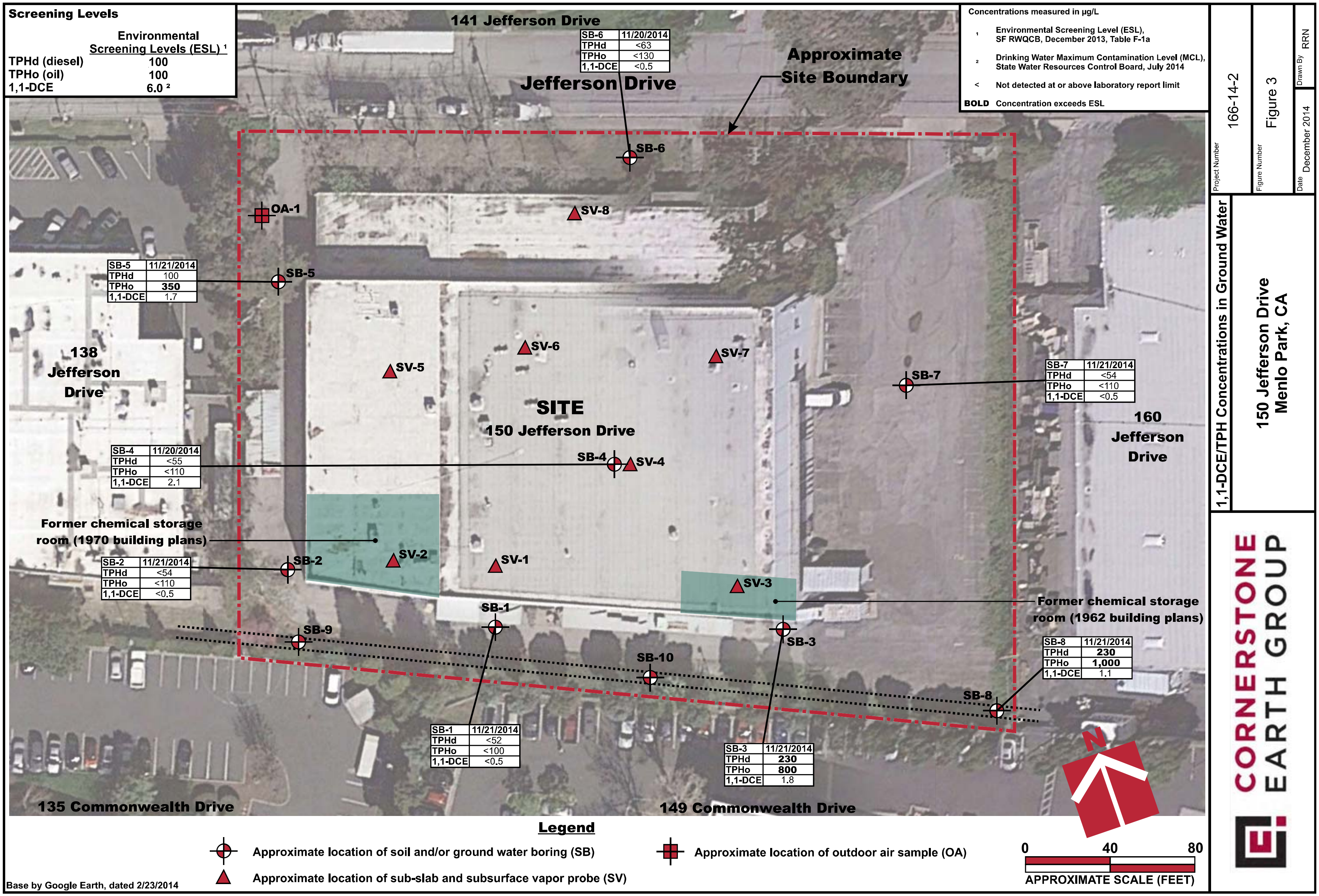
150 Jefferson Drive
Menlo Park, CA

Project Number 166-14-2

Figure Number Figure 2

Date December 2014

Drawn By RRN



Screening Levels
Environmental Screening Levels (ESL) [1]
TPHd (diesel) 100
TPHo (oil) 100
1,1-DCE 6.0 [2]
141 Jefferson Drive
SB-6 | 11/20/2014 | TPHd <63 | TPHo <130 | 1,1-DCE <0.5
Jefferson Drive
Approximate Site Boundary
Concentrations measured in μg/L
1 Environmental Screening Level (ESL), SF RWQCB, December 2013, Table F-1a
2 Drinking Water Maximum Contamination Level (MCL), State Water Resources Control Board, July 2014
< Not detected at or above laboratory report limit
BOLD Concentration exceeds ESL
OA-1
SV-8
SB-5 | 11/21/2014 | TPHd 100 | TPHo **350** | 1,1-DCE 1.7
SV-5
SV-6
SV-7
SB-7 | 11/21/2014 | TPHd <54 | TPHo <110 | 1,1-DCE <0.5
138 Jefferson Drive
SITE
150 Jefferson Drive
160 Jefferson Drive
SB-4 | 11/20/2014 | TPHd <55 | TPHo <110 | 1,1-DCE 2.1
SV-4
Former chemical storage room (1970 building plans)
SB-2 | 11/21/2014 | TPHd <54 | TPHo <110 | 1,1-DCE <0.5
SV-2
SV-1
SV-3
Former chemical storage room (1962 building plans)
SB-9
SB-10
SB-8 | 11/21/2014 | TPHd **230** | TPHo **1,000** | 1,1-DCE 1.1
SB-1 | 11/21/2014 | TPHd <52 | TPHo <100 | 1,1-DCE <0.5
SB-3 | 11/21/2014 | TPHd **230** | TPHo **800** | 1,1-DCE 1.8
135 Commonwealth Drive
149 Commonwealth Drive
N
Legend
Approximate location of soil and/or ground water boring (SB)
Approximate location of sub-slab and subsurface vapor probe (SV)
Approximate location of outdoor air sample (OA)
0 40 80
APPROXIMATE SCALE (FEET)
Base by Google Earth, dated 2/23/2014
CORNERSTONE EARTH GROUP
1,1-DCE/TPH Concentrations in Ground Water
150 Jefferson Drive
Menlo Park, CA
Project Number 166-14-2
Figure Number Figure 3
Date December 2014
Drawn By RRN

Screening Levels

	Residential RSL[1] Indoor Air	AF = 0.05[2]	AF = 0.002[3]
Benzene	0.4	7.2	180
Chloroform	0.12	2.0	60

Concentrations measured in μg/m³

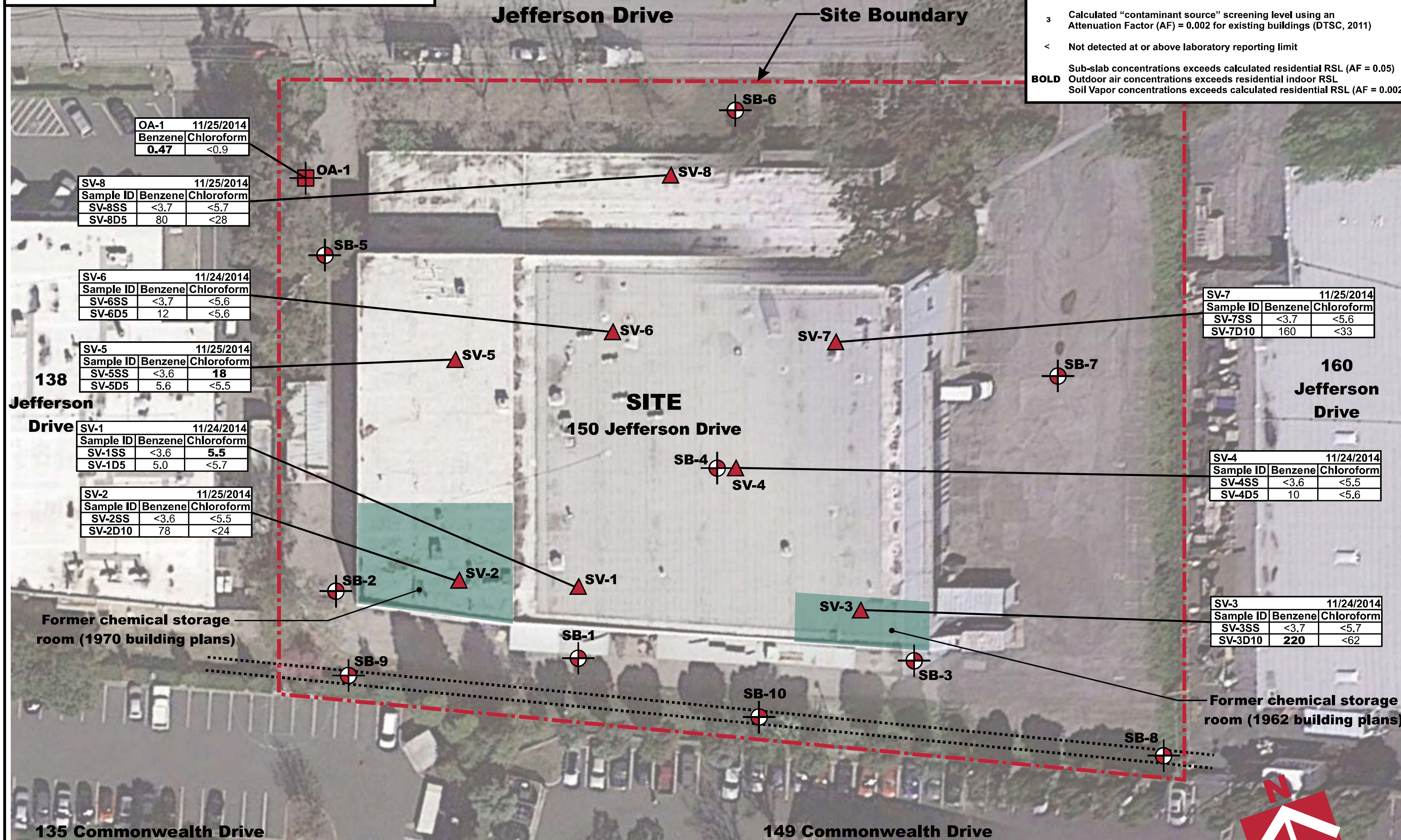
1 Regional Screening Level (RSL), USEPA Region 9 - November 2014

2 Calculated sub-slab screening level using an Attenuation Factor (AF) = 0.05 for existing buildings (DTSC, 2011)

3 Calculated "contaminant source" screening level using an Attenuation Factor (AF) = 0.002 for existing buildings (DTSC, 2011)

< Not detected at or above laboratory reporting limit

BOLD Sub-slab concentrations exceeds calculated residential RSL (AF = 0.05)
Outdoor air concentrations exceeds residential indoor RSL
Soil Vapor concentrations exceeds calculated residential RSL (AF = 0.002)



OA-1	11/25/2014
Benzene	Chloroform
0.47	<0.9

SV-8		11/25/2014
Sample ID	Benzene	Chloroform
SV-8SS	<3.7	<5.7
SV-8D5	80	<28

SV-6		11/24/2014
Sample ID	Benzene	Chloroform
SV-6SS	<3.7	<5.6
SV-6D5	12	<5.6

SV-5		11/25/2014
Sample ID	Benzene	Chloroform
SV-5SS	<3.6	**18**
SV-5D5	5.6	<5.5

SV-1		11/24/2014
Sample ID	Benzene	Chloroform
SV-1SS	<3.6	**5.5**
SV-1D5	5.0	<5.7

SV-2		11/25/2014
Sample ID	Benzene	Chloroform
SV-2SS	<3.6	<5.5
SV-2D10	78	<24

SV-7		11/25/2014
Sample ID	Benzene	Chloroform
SV-7SS	<3.7	<5.6
SV-7D10	160	<33

SV-4		11/24/2014
Sample ID	Benzene	Chloroform
SV-4SS	<3.6	<5.5
SV-4D5	10	<5.6

SV-3		11/24/2014
Sample ID	Benzene	Chloroform
SV-3SS	<3.7	<5.7
SV-3D10	**220**	<62

Legend

- Approximate location of soil and/or ground water boring (SB)
- Approximate location of sub-slab and subsurface vapor probe (SV)
- Approximate location of outdoor air sample (OA)

SV-SS Sub-slab soil vapor sample ID

SV-D5 Subsurface soil vapor sample ID

0 40 80
APPROXIMATE SCALE (FEET)

Base by Google Earth, dated 2/23/2014

CORNERSTONE EARTH GROUP

Concentrations in Soil Vapor

150 Jefferson Drive
Menlo Park, CA

Project Number 166-14-2

Figure Number Figure 4

Date December 2014

Drawn By RRN

DATA SUMMARY TABLES

CORNERSTONE EARTH GROUP

Table 1. Analytical Results of Soil Samples - Metals

(Concentrations in mg/kg)

Sample Location	Boring ID	Soil Type	Sample ID	Date	Depth (feet)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Vanadium	Zinc
Outside Near Hazardous Materials Storage Area	SB-1	Native	SB-1 (1-1.5)	11/21/2014	1-1½	<3.4	97	<0.34	<0.43	110	21	56	<1.7	0.085	64	100	53
Outside Near Former Chemical Storage Area - West	SB-2	Native	SB-2 (0.5-1)	11/21/2014	½-1	<3.8	380	<0.38	0.53	33	8	25	3.9	0.044	34	49	48
Outside Near Former Chemical Storage Area - East	SB-3	Native	SB-3 (0.5-1)	11/21/2014	½-1	3.7	210	0.5	<0.38	34	9.1	23	6.1	0.047	37	32	48
Inside Near Center of Manufacturing Area	SB-4	Fill	SB-4 (1-1.5)	11/20/2014	1-1½	7.6	310	0.28	<0.34	28	16	44	11	0.11	35	38	69
Outside Southeast Corner of Site	SB-8	Native	SB-8 (0.5-1)	11/21/2014	½-1	5.7	210	<0.35	<0.44	39	13	22	10	0.022	41	40	50
Outside Near Former Rail Spur Alignment - Southwest	SB-9	Native	SB-9 (0.5-1)	11/21/2014	½-1	5.5	220	0.72	3.6	49	11	30	12	0.044	45	48	62
Outside Near Former Rail Spur Alignment - South	SB-10	Native	SB-10 (0.5-1)	11/21/2014	½-1	5.5	200	0.84	<0.44	49	11	28	6.3	0.028	46	44	63
Inside North Office Space Area	SV-8	Fill	SV-8 (1-1.5)	11/20/2014	1-1½	4.4	95	<0.34	<0.43	29	9.1	21	6.6	0.093	30	38	43
Residential RSL[1] (HQ=0.1)						0.67	1,500	16	7	NE	2.3	310	80 [2]	0.94	150	39	2,300
Scott, 1991 [3]			Background Range			0.2 to 5.5	NE	0.3 to 1.4	0.05 to 1.7	30.5 to 72	NE	23.8 to 47.5	6.8 to 16.1	0.05 to 0.90	46.4 to 101	39 to 288	47.7 to 82.8
			Maximum Background Detection			20	NE	3.2	14	170	NE	67	54	1.3	145	NE	120
Bradford, 1996 [4]			Background Range			0.6 to 11	133 to 1,400	0.25 to 2.7	0.05 to 1.7	23 to 1,579	2.7 to 46.9	9.1 to 96.4	12.4 to 97.1	0.05 to 0.90	9 to 509	39 to 288	88 to 236
			Upper Quartile			4.7	625	1.53	0.44	115	18.3	36.6	26.7	0.34	56	134	170
LBNL, 2009 [5]			99th Percentile			28	410	1	5.6	120	25	63	43	0.42	272	90	140
			95% Upper Tolerance Limit (UTL)			19.1	323.6	1	2.7	99.6	22.2	69.4	16.1	0.4	119.8	74.3	106.1
Duverge, 2011 [6]			Mean			4.6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
			99th Percentile			11	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
TTLC [7]						500	10,000	75	100	2,500	8,000	2,500	1,000	20	2,000	2,400	5,000
STLC [8] (mg/L)						5	100	0.75	1	5	80	25	5	0.2	20	24	250

1 Regional Screening Level (RSL) with Hazard Quotient (HQ) = 0.1, USEPA Region 9 – November 2014
2 California Human Health Screening Level (CHHSL), CalEPA - September 2010
3 Scott, Christina. December 1991. Background Metal Concentrations in Soils in Northern Santa Clara County.
4 Bradford, et. al. March 1996. Background Concentrations of Trace and Major Elements in California Soils.
5 LBNL, 2009. Analysis of Background Distributions of Metals in the Soil at Lawrence Berkeley National Laboratory.
6 Duverge, 2011. Establishing Background Arsenic in Soil of the Urbanized San Francisco Bay Region.
7 Total Threshold Limit Concentration - California Code of Regulations, Title 22, Chapter 11, Article 3.
8 Soluble Threshold Limit Concentration - California Code of Regulations, Title 22, Chapter 11, Article 3.
< Not detected at or above laboratory reporting limit
NE Not Established

Table 2. Analytical Results of Soil Samples - TPH / VOCs / PAHs / SVOCs

(Concentrations in mg/kg)

Sample Location	Boring ID	Soil Type	Sample ID	Date	Depth (feet)	TPHd	TPHo	TPHg	BTEX	Fuel Oxygenates	Acetone	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1 - DCE	1,1-DCA	Other VOCs	Anthracene	Other PAHs (EPA 8270C SIM)	SVOCs (EPA 8270)
Outside Near Hazardous Materials Storage Area	SB-1	Native	SB-1 (1-1.5)	11/21/2014	1-1½	39	**130**	<0.26	ND	ND	<0.052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	ND	<0.067	---	ND
		Native	SB-1 (9.5-10)	11/21/2014	9½-10	<0.99	<49	<0.2	ND	ND	<0.041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	ND	---	---	---
Outside Near Former Chemical Storage Area - West	SB-2	Native	SB-2 (0.5-1)	11/21/2014	½-1	24	77	<0.31	ND	ND	<0.061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	ND	<0.066	---	ND
		Native	SB-2 (9.5-10)	11/21/2014	9½-10	<0.98	<49	<0.21	ND	ND	<0.043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	ND	---	---	---
Outside Near Former Chemical Storage Area - East	SB-3	Native	SB-3 (0.5-1)	11/21/2014	½-1	7.7	<50	<0.26	ND	ND	<0.052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	ND	<0.067	---	ND
		Native	SB-3 (9.5-10)	11/21/2014	9½-10	<1	<50	<0.22	ND	ND	<0.044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	ND	---	---	---
Inside Near Center of Manufacturing Area	SB-4	Fill	SB-4 (1-1.5)	11/20/2014	1-1½	1.3	<50	<0.21	ND	ND	<0.042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	ND	<0.067	---	ND
		Native	SB-4 (5-5.5)	11/20/2014	5-5½	<1.0	<50	<0.2	ND	ND	<0.039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	ND	---	---	---
Outside Southeast Corner of Site	SB-8	Native	SB-8 (0.5-1)	11/21/2014	½-1	1.3	<50	---	---	---	---	---	---	---	---	---	---	---	---	<0.0049	ND	---
Outside Near Former Rail Spur Alignment - Southwest	SB-9	Native	SB-9 (0.5-1)	11/21/2014	½-1	1.2	<49	---	---	---	---	---	---	---	---	---	---	---	---	0.005	ND	---
Outside Near Former Rail Spur Alignment - South	SB-10	Native	SB-10 (0.5-1)	11/21/2014	½-1	<0.99	<49	---	---	---	---	---	---	---	---	---	---	---	---	<0.0049	ND	---
Inside South Manufacturing Area	SV-1	Fill/Native Contact	SV-1 (4-4.5)	11/20/2014	4-4½	---	---	---	---	---	---	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	ND	---	---	---
Near Former Chemical Storage Area - West	SV-2	Fill	SV-2 (0.5-1)	11/20/2014	½-1	---	---	---	---	---	---	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	ND	---	---	---
Near Former Chemical Storage Area - East	SV-3	Fill	SV-3 (1-1.5)	11/20/2014	1-1½	---	---	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	ND	---	---	---
		Fill/Native Contact	SV-3 (4-4.5)	11/20/2014	4-4½	---	---	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	ND	---	---	---
Inside Northwest Manufacturing Area	SV-5	Fill/Native Contact	SV-5 (4-4.5)	11/20/2014	4-4½	---	---	---	---	---	---	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	ND	---	---	---
Inside North Manufacturing Area	SV-6	Fill	SV-6 (0.5-1)	11/20/2014	½-1	---	---	---	---	---	---	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	ND	---	---	---
Inside Northeast Manufacturing Area	SV-7	Fill/Native Contact	SV-7 (5-5.5)	11/20/2014	5-5½	---	---	---	---	---	---	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	ND	---	---	---
Inside North Office Space Area	SV-8	Fill	SV-8 (1-1.5)	11/20/2014	1-1½	<1	<50	<0.25	ND	ND	<0.049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	ND	<0.066	---	ND
Residential RSL[1] (HQ=0.1)						100[2]	100[2]	100[2]	VARIOUS	VARIOUS	6,100	8.1	0.41	16	160	0.059	23	3.6	VARIOUS	1,700	VARIOUS	VARIOUS

1	Regional Screening Level (RSL) with Hazard Quotient (HQ) = 0.1, USEPA Region 9 – November 2014
2	Environmental Screening Level (ESL), RWQCB, San Francisco Bay Region – December 2013
<	Not detected at or above laboratory reporting limit
NE	Not Established
ND	Not Detected
---	Not Analyzed

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Table 3. Analytical Results of Soil Samples - PCBs / OCPs
(Concentrations in mg/kg)

Sample Location	Boring ID	Soil Type	Sample ID	Date	Depth (feet)	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	OCPs (EPA 8082)
Outside Near Hazardous Materials Storage Area	SB-1	Native	SB-1 (1-1.5)	11/21/2014	1-1½	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	ND
Outside Near Former Chemical Storage Area - West	SB-2	Native	SB-2 (0.5-1)	11/21/2014	½-1	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	ND
Outside Near Former Chemical Storage Area - East	SB-3	Native	SB-3 (0.5-1)	11/21/2014	½-1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND
Inside Near Center of Manufacturing Area	SB-4	Fill	SB-4 (1-1.5)	11/20/2014	1-1½	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	ND
Outside Southeast Corner of Site	SB-8	Native	SB-8 (0.5-1)	11/21/2014	½-1	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	ND
Outside Near Former Rail Spur Alignment - Southwest	SB-9	Native	SB-9 (0.5-1)	11/21/2014	½-1	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	ND
Outside Near Former Rail Spur Alignment - South	SB-10	Native	SB-10 (0.5-1)	11/21/2014	½-1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND
Inside North Office Space Area	SV-8	Fill	SV-8 (1-1.5)	11/20/2014	1-1½	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048	ND
Residential RSL[1] (HQ=0.1)						0.4	0.15	0.15	0.24	0.24	0.11	0.24	VARIOUS

1 Regional Screening Level (RSL) with Hazard Quotient (HQ) = 0.1, USEPA Region 9 – November 2014
< Not detected at or above laboratory reporting limit
NE Not Established
ND Not Detected

Table 4. Analytical Results of Soil Samples - Asbestos
(Concentrations in total weight % asbestos)

Sample Location	Boring ID	Soil Type	Sample ID	Date	Depth (feet)	Total Asbestos[1]
Near Former Chemical Storage Area - West	SV-2	Fill	SV-2 (2.5-3.5)	11/20/2014	2½-3½	<0.0001
Inside Near Center of Manufacturing Area	SB-4	Fill	SB-4 (2-2.5)	11/20/2014	2-2½	<0.0001
		Native	SB-4 (4-5)	11/20/2014	4-5	<0.0001
Inside Northeast Manufacturing Area	SB-7	Native	SB-7 (6-7)	11/21/2014	6-7	<0.0001
Inside North Office Space Area	SV-8	Fill	SV-8 (1-1.5)	11/21/2014	1-1½	<0.0001

1 EPA Test Method For the Determination of Asbestos in Bulk Building Materials - TEM method (EPA 600/R-93/116) with CARB 435 prep method

< Not detected at or above laboratory reporting limit

Table 5. Analytical Results of Ground Water Samples - TPH / VOCs / SVOCs
(Concentrations in µg/L)

Sample Location	Sample ID	Date	TPHd	TPHo	TPHg	BTEX	Fuel Oxygenates	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1 - DCE	1,1-DCA	Other VOCs	SVOCs
Outside Near Hazardous Materials Storage Area	SB-1	11/21/2014	<52	<100	<50	ND	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	ND
Outside Near Former Chemical Storage Area - West	SB-2	11/21/2014	<54	<110	<50	ND	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	ND
Outside Near Former Chemical Storage Area - East	SB-3	11/21/2014	**230**	**800**	<50	ND	ND	<0.5	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	ND	ND
Inside Near Center of Manufacturing Area	SB-4	11/20/2014	<55	<110	<50	ND	ND	<0.50	<0.50	<0.50	<0.50	<0.50	2.1	<0.50	ND	ND
Outside Northwest	SB-5	11/21/2014	100	**350**	<50	ND	ND	<0.5	<0.5	<0.5	<0.5	<0.5	1.7	<0.5	ND	ND
Outside North Landscaping	SB-6	11/20/2014	<63	<130	<50	ND	ND	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	ND	ND
Outside East Parking Lot	SB-7	11/21/2014	<54	<110	<50	ND	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	ND
Outside Southeast Corner of Site	SB-8	11/21/2014	**230**	**1,000**	<50	ND	ND	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	ND	ND
Drinking Water MCL[1]			100 [2]	100 [2]	100 [2]	VAR	VAR	5	5	6	10	0.5	6	5	VAR	VAR

1 Maximum Contaminant Level (MCL), California Department of Public Health – July 2014
2 MCL not established; value is Environmental Screening Level (ESL) (San Francisco RWQCB, December 2013. Table F-1a)
< Not detected at or above laboratory reporting limit
NE Not Established
ND Not Detected
VAR Various
BOLD Concentration exceeds Drinking Water MCL

Table 6. Analytical Results of Soil Vapor / Outdoor Air Samples

(Concentrations in µg/m³)

Sample Location	Sample ID	Depth (feet from existing grade)	Sample Type	Date	Benzene	Toluene	Ethylbenzene	1,2,4-Trimethylbenzene	1,3-Dichlorobenzene	2-Butanone (MEK)	4-Ethyl Toluene	4-Methyl-2-Pentanone (MIBK)	Acetone	Carbon Disulfide	Chloroform	Cyclohexane	Freon 113	Heptane
Inside South Manufacturing Area	SV-1SS	below slab	Sub-Slab	11/24/2014	<3.6	<4.2	<4.9	<5.6	<6.8	<13	<5.6	<4.6	<27	<14	**5.5**	<3.9	<8.7	<4.6
Near Former Chemical Storage Area - West	SV-2SS	below slab		11/25/2014	<3.6	<4.2	<4.9	<5.5	<6.7	<13	<5.5	<4.6	28	<14	<5.5	<3.8	<8.6	<4.6
Near Former Chemical Storage Area - East	SV-3SS	below slab		11/24/2014	<3.7	8.1	<5.0	<5.7	8.4	140	<5.7	6.2	470	36	<5.7	<4.0	<8.9	<4.8
Inside Near Center of Manufacturing Area	SV-4SS	below slab		11/24/2014	<3.6	<4.3	<4.9	<5.6	<6.8	<13	<5.6	<4.6	<27	<14	<5.5	<3.9	<8.7	<4.6
Inside Northwest Manufacturing Area	SV-5SS	below slab		11/25/2014	<3.6	<4.2	<4.9	<5.6	<6.8	<13	<5.6	<4.6	31	18	**18**	<3.9	<8.7	<4.6
Inside North Manufacturing Area	SV-6SS	below slab		11/24/2014	<3.7	<4.3	<5.0	<5.6	<6.9	<14	<5.6	<4.7	<27	<14	<5.6	<4.0	11	<4.7
Inside Northeast Manufacturing Area	SV-7SS	below slab		11/25/2014	<3.7	<4.3	<5.0	<5.6	<6.9	73	<5.6	5.8	30	<14	<5.6	<4.0	9.6	<4.7
Inside North Office Space Area	SV-8SS	below slab		11/25/2014	<3.7	<4.4	<5.0	<5.7	<7.0	<14	<5.7	<4.8	<28	<14	<5.7	<4.0	<8.9	<4.8
Outside Northwest Corner of Site	OA-1	---	Outdoor Air	11/25/2014	**0.47**	1.2	0.21	<0.91	<1.1	2.8	<0.91	<0.76	7.9	<2.9	<0.9	<0.64	<1.4	<0.76
Inside South Manufacturing Area	SV-1D5	5	Soil Vapor	11/24/2014	5	<4.4	<5.0	<5.7	<7.0	<14	<5.7	<4.8	53	<14	<5.7	4.4	<8.9	<4.8
Near Former Chemical Storage Area - West	SV-2D10	10		11/25/2014	78	130	38	35	<30	<59	35	<20	<120	350	<24	2,500	<38	25
Near Former Chemical Storage Area - East	SV-3D10	10		11/24/2014	**220**	210	59	75	<76	<150	77	<52	<300	710	<62	3,500	<96	<52
Inside Near Center of Manufacturing Area	SV-4D5	5		11/24/2014	10	15	6.4	12	<6.9	<14	12	<4.7	52	26	<5.6	42	<8.8	<4.7
Inside Northwest Manufacturing Area	SV-5D5	5		11/25/2014	5.6	12	8.7	16	<6.8	15	15	<4.6	54	19	<5.5	33	<8.7	<4.6
Inside North Manufacturing Area	SV-6D5	5		11/24/2014	12	17	9	18	<6.9	45	18	<4.7	120	58	<5.6	14	37	<4.7
Inside Northeast Manufacturing Area	SV-7D10	10		11/25/2014	160	38	<29	<33	<40	<80	<33	<28	<160	340	<33	27	<52	<28
Inside North Office Space Area	SV-8D5	5		11/25/2014	80	31	<25	<28	<34	<67	<28	<23	<140	230	<28	20	<44	<23
Residential RSL[1]	Indoor Air				0.36	520.0	1.1	0.73	NE	520	NE	310	3200	73	0.12	630	NE	NE
	AF=0.05 [2] (Indoor Air / Subslab)				7.2	10,400	22	15	NE	10,400	NE	6,200	64,000	1,460	2.4	12,600	NE	NE
	AF = 0.002 [3] (Indoor Air / Subsurface Soil Gas)				180	260,000	550	365	NE	260,000	NE	155,000	1,600,000	36,500	60	315,000	NE	NE
Residential ESL[4]					42	160,000	490	NE	NE	2,600,000	NE	1,600,000	16,000,000	NE	230	NE	NE	NE

1 Regional Screening Level (RSL), USEPA Region 9 - May 2014
2 Calculated sub-slab screening level using an Attenuation Factor (AF) = 0.05 for existing buildings (DTSC, 2011)
3 Calculated "contaminant source" screening level using an Attenuation Factor (AF) = 0.002 for existing buildings (DTSC, 2011)
4 Environmental Screening Level (ESL), RWQCB, San Francisco Bay Region – December 2013
5 Prompt Response Action Level, "EPA Region 9 Guidelines and Supplemental Information Needed for Vapor Intrusion Evaluations at the South Bay National Priorities List (NPL) Sites," USEPA to Water Board - December 2013

6 Based on 2010 Bay Area Air Quality Management District Ambient Air Quality Report. Concentration provided pertain to data collected at the Redwood City air monitoring station.
< Not detected at or above laboratory reporting limit
--- Not Applicable
NE Not Established
BOLD Sub-slab concentrations exceeds calculated residential RSL using an AF = 0.05
Outdoor air concentrations exceeds residential indoor air RSL
Soil vapor concentrations exceeds calculated residential RSL using an AF = 0.002

CORNERSTONE EARTH GROUP

Table 6. Analytical Results of Soil Vapor / Outdoor Air Samples - continued

(Concentrations in µg/m³)

Sample Location	Sample ID	Depth (feet from existing grade)	Sample Type	Date	Hexane	Isopropanol	m,p-Xylene	o-xylene	Tetrahydrofuran	Trichlorofluoromethane	MTBE	1,1,1-TCA	Ethanol	Carbon Dioxide	Oxygen
Inside South Manufacturing Area	SV-1SS	below slab	Sub-Slab	11/24/2014	<4.0	12	<4.9	<4.9	<3.3	<6.3	<4.1	<6.2	<8.5	4.1	16
Near Former Chemical Storage Area - West	SV-2SS	below slab		11/25/2014	<3.9	18	<4.9	<4.9	3.4	<6.3	<4.0	<6.1	8.6	3.2	16
Near Former Chemical Storage Area - East	SV-3SS	below slab		11/24/2014	<4.1	240	6.8	<5.0	130	<6.5	5.7	<6.3	38	0.35	20
Inside Near Center of Manufacturing Area	SV-4SS	below slab		11/24/2014	<4.0	17	<4.9	<4.9	<3.3	<6.4	<4.1	<6.2	74	3.1	17
Inside Northwest Manufacturing Area	SV-5SS	below slab		11/25/2014	<4.0	36	<4.0	<4.9	<3.3	<6.3	<4.1	<6.2	<8.5	7	13
Inside North Manufacturing Area	SV-6SS	below slab		11/24/2014	<4.0	18	<4.9	<5.0	<3.4	<6.5	<4.1	12	<8.7	2.7	18
Inside Northeast Manufacturing Area	SV-7SS	below slab		11/25/2014	<4.0	82	<5.0	<5.0	17	<6.5	<4.1	31	590	2.4	18
Inside North Office Space Area	SV-8SS	below slab		11/25/2014	<4.1	45	<5.0	<5.0	<3.4	<6.5	<4.2	<6.3	48	0.77	20
Outside Northwest Corner of Site	OA-1	---	Outdoor Air	11/25/2014	<0.65	4.1	0.65	0.26	<2.7	1.6	<0.67	<0.2	7.1	---	---
Inside South Manufacturing Area	SV-1D5	5	Soil Vapor	11/24/2014	<4.1	<11	8.4	<5.0	26	<6.5	<4.2	<6.3	13	12	8.1
Near Former Chemical Storage Area - West	SV-2D10	10		11/25/2014	28	54	170	47	29	<28	<18	<27	200	0.29	17
Near Former Chemical Storage Area - East	SV-3D10	10		11/24/2014	<44	130	260	77	88	<71	<45	<69	<95	3.8	12
Inside Near Center of Manufacturing Area	SV-4D5	5		11/24/2014	<4.0	<11	30	9.9	39	<6.5	<4.1	16	<8.7	12	4.2
Inside Northwest Manufacturing Area	SV-5D5	5		11/25/2014	<4.0	<11	37	11	43	<6.4	<4.1	<6.2	<8.6	8.6	12
Inside North Manufacturing Area	SV-6D5	5		11/24/2014	<4.1	<11	41	14	74	<6.5	<4.2	46	<8.7	9.2	9
Inside Northeast Manufacturing Area	SV-7D10	10		11/25/2014	31	<66	<29	<29	51	<38	<24	<37	<51	0.68	16
Inside North Office Space Area	SV-8D5	5		11/25/2014	<20	<56	<25	<25	35	<32	<20	<31	<43	0.97	16
Residential RSL[1]	Indoor Air				73	730	10	10	210	73	11	520	NE	NE	NE
	AF=0.05 [2] (Indoor Air / Subslab)				1,460	14,600	200	200	4,200	1,460	220	10,400	NE	NE	NE
	AF = 0.002 [3] (Indoor Air / Subsurface Soil Gas)				36,500	365,000	5,000	5,000	105,000	36,500	5,500	260,000	NE	NE	NE
Residential ESL[4]					NE	NE	NE	NE	NE	NE	4,700	2,600,000	NE	NE	NE

1 Regional Screening Level (RSL), USEPA Region 9 - May 2014
2 Calculated sub-slab screening level using an Attenuation Factor (AF) = 0.05 for existing buildings (DTSC, 2011)
3 Calculated "contaminant source" screening level using an Attenuation Factor (AF) = 0.002 for existing buildings (DTSC, 2011)
4 Environmental Screening Level (ESL), RWQCB, San Francisco Bay Region – December 2013
5 Prompt Response Action Level, "EPA Region 9 Guidelines and Supplemental Information Needed for Vapor Intrusion Evaluations at the South Bay National Priorities List (NPL) Sites," USEPA to Water Board - December 2013

6 Based on 2010 Bay Area Air Quality Management District Ambient Air Quality Report. Concentration provided pertain to data collected at the Redwood City air monitoring station.
< Not detected at or above laboratory reporting limit
--- Not Applicable
NE Not Established
BOLD Sub-slab concentrations exceeds calculated residential RSL using an AF = 0.05
Outdoor air concentrations exceeds residential indoor air RSL
Soil vapor concentrations exceeds calculated residential RSL using an AF = 0.002

APPENDIX G3:

MAY 2016 PEA AND JUNE 2016 DTSC PEA APPROVAL LETTER

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Barbara A. Lee, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Edmund G. Brown Jr.
Governor

June 13, 2016

Dr. James Lianides
Superintendent
Sequoia Union High School District
480 James Avenue
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APPROVAL OF THE PRELIMINARY ENVIRONMENTAL ASSESSMENT REPORT, SEQUOIA UNION HIGH SCHOOL DISTRICT, MENLO PARK PROPOSED SCHOOL (A.K.A. MENLO PARK SMALL HIGH SCHOOL PROJECT), 150 JEFFERSON DRIVE, MENLO PARK, SAN MATEO COUNTY (PROJECT CODE 204273)

Dear Mr. Lianides:

The Department of Toxic Substances Control (DTSC) reviewed the revised Preliminary Environmental Assessment Report (PEA Report – Cornerstone Earth Group [Cornerstone], May 12, 2016) received on June 3, 2016. The revised PEA Report was prepared in response to DTSC comments on the draft version forwarded in a letter dated April 12, 2016, as well as follow up correspondence. The PEA Report presents investigation results and conclusions based on a health risk screening evaluation for the project.

In addition, on May 12, 2016, Cornerstone, on behalf of the Sequoia Union High School District (District), notified DTSC that it had complied with all public review and comment requirements for the PEA Report pursuant to Education Code section 17213.1(a)(6)(A). The District made the PEA Report available for public review and comment from March 30, 2016 through April 30, 2016, and a public hearing was held on April 20, 2016. No public comments were received regarding the PEA Report.

According to the PEA Report, the approximately 2.17-acre parcel is located at 150 Jefferson Drive in Menlo Park, San Mateo County, California (Site). The District plans to redevelop the Site with the new Menlo Park Small High School Project which will include approximately 22 classrooms with a capacity for 400 students. The District will demolish the existing warehouse building and construct new high school structures as well as an associated exterior play field and parking areas.

An Environmental Site Assessment (Phase I and Phase II - Cornerstone, 2014) for the Site was conducted in 2014. The Phase I indicated that the Site was undeveloped until construction of the existing building in approximately 1962. From late 1970s or early 1980s to the present, Bay Associates Wire Technologies occupied the Site. Other than the existing warehouse building, the remainder of the Site was occupied by an asphalt pavement parking lot. The building is used for the manufacture of custom cable and wire products, as well as administrative office space.

The PEA investigated Site soil near the existing building to evaluate potential impacts from possible pest control spraying near the building perimeter, and potential impacts from building materials such as lead-based paint and/or polychlorinated biphenyls (PCBs) caulking compounds; and, near the existing PG&E transformer since there is a potential that PCBs may have been historically used within the transformer in the past. Soil vapor sampling was performed to evaluate potential vapor intrusion concerns associated with the volatile organic compounds (VOCs) reported in groundwater beneath the regional area from unidentified off-Site sources.

The PEA Report indicates that analytical results from the Phase II investigation were included in the health risk evaluation with the exception[1] of the sub-slab soil vapor data and soil data representative of the fill beneath the raised warehouse. Lead was detected at concentrations up to 9.9 milligram per kilogram (mg/kg) in the soil samples which is below the 80 mg/kg screening level. Organochlorine pesticides (OCPs) and PCBs were not detected above their respective laboratory reporting limits in the selected soil samples.

During the Phase II sampling in November 2014, benzene concentration in a soil vapor sample was detected at 220 microgram per cubic meter ($\mu g/m^3$). During this PEA sampling event in December 2015, a soil vapor sample was collected at the same general location and depth that detected benzene concentration at 13 $\mu g/m^3$. Similar low concentrations were detected in the other soil vapor samples up to 23 $\mu g/m^3$. In addition, oxygen concentrations in the soil vapor samples collected in November 2014 and December 2015 ranged from 6.8 to 20 percent, which indicates aerobic conditions. The potential for petroleum hydrocarbon vapor intrusion will be reduced over time since petroleum hydrocarbon vapors, like benzene, will naturally degrade in an aerobic environment.

The results were evaluated in a health risk assessment for residential land use scenario using all analytes detected in soil, excluding naturally occurring metals, and soil vapor. The resulting cumulative non-cancer hazard index is 0.5, which is below the target

[1] The Phase II sub-slab vapor and fill data were excluded because the District plans to demolish the existing building, remove the fill underlying the raised floor slab, and construct a new at-grade school building.

hazard of 1.0. The cumulative cancer risk is $5x10^{-6}$. Note that the benzene concentration of 220 $\mu g/m^3$ is the driver in the risk calculation. The PEA concludes that although the cumulative cancer risk is slightly above the target cancer risk of $1x10^{-6}$ typically used by DTSC for school sites, based on the results, and considering the conservative nature of the screening level evaluation, the potential exposure to future Site occupants does not pose a significant risk to human health and the environment. Furthermore, the District is planning on installing an impermeable vapor barrier and ventilation system beneath the planned classroom building to provide a higher level of protection to future occupants against potential VOC vapor and radon gas intrusion. The PEA recommends a “no further action” determination.

Based on review of the revised PEA Report, neither a release of hazardous material nor the presence of a naturally occurring hazardous material which would pose a threat to public health or the environment under unrestricted land use was indicated at the Site. Therefore, DTSC concurs with the conclusion of the revised PEA Report that further environmental investigation of the Site is not required and hereby approves the PEA Report.

Pursuant to Education Code section 17213.2, subdivision (e), if a previously unidentified release or threatened release of a hazardous material or the presence of a naturally occurring hazardous material is discovered anytime during construction at the Site, the District shall cease all construction activities at the site and notify DTSC. Additional assessment, investigation, or cleanup may be required.

If you have any questions regarding the project, please contact Ms. Mellan Songco, DTSC Project Manager at (916) 255-6527 or via e-mail at Mellan.Songco@dtsc.ca.gov or myself at (916) 255-3732 or via e-mail at Jose.Salcedo@dtsc.ca.gov.

Sincerely,

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CORNERSTONE
EARTH GROUP

Type of Services	**Preliminary Environmental Assessment Report**
Location	**Menlo Park Small High School Project** **150 Jefferson Drive** **Menlo Park, California** **(SITE CODE 204273)**
Client	**Sequoia Union High School District**
Client Address	**480 James Avenue** **Redwood City, CA 94062**
Project Number	**166-14-8**
Date	**May 12, 2016**

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CORNERSTONE EARTH GROUP

Type of Services	**Preliminary Environmental Assessment Report**
Location	**Menlo Park Small High School Project** **150 Jefferson Drive** **Menlo Park, California** **(SITE CODE 204273)**

SECTION 1.0: INTRODUCTION

This Preliminary Environmental Assessment (PEA) report was prepared at the request of the Department of Toxic Substances Control (DTSC) to evaluate current Site conditions at the planned Menlo Park Small High School Project located at 150 Jefferson Drive in Menlo Park, California (Site, Figures 1 and 2). This PEA report was prepared in accordance with the Revised PEA Work Plan dated November 13, 2015 prepared by Cornerstone Earth Group (Cornerstone) and addresses the comments received from DTSC in their letter pertaining to Cornerstone's draft PEA Report dated March 15, 2016. A copy of DTSC's PEA Work Plan approval letter dated November 30, 2015 and Draft PEA Report comments letter dated April 12, 2016 are included in Appendix A.

This work was performed for the Sequoia Union High School District (District) in accordance with our agreement with the District dated December 1, 2015.

1.1 SITE DESCRIPTION

The approximately 2.17-acre property is located at 150 Jefferson Drive in Menlo Park and is currently occupied with an asphalt pavement parking lot and warehouse building; identified by Assessor's Parcel No. (APN) 055-243-030 and shown on the APN map included in Appendix B. The Site is located in a commercial area and is bound to the north by Jefferson Drive. A 43,986 square-foot structure exists on the Site and is currently occupied by Bay Associates Wire Technologies. The majority of the building is used for manufacturing of custom cable and wire products with the northern portion utilized for administrative office space. The majority of the building work floor is raised approximately 4 feet above the parking lot grade to accommodate the truck-loading bays along the eastern portion of the building.

1.2 PLANNED DEVELOPMENT

The District is planning to redevelop the Site with the new Menlo Park Small High School Project. To prepare the school for the 2018-19 school year, the District will demolish the existing warehouse building and construct approximately 40,000 square feet of new high school structures and associated exterior play field and parking areas. The school will have capacity for 400 students and 35 faculty and staff. Potable water will be supplied by the local water service provider. The planned development is shown on Figure 3.

1.3 PEA OBJECTIVES

As defined by DTSC, Preliminary Endangerment Assessment (PEA) means an activity which is performed to determine whether current or past hazardous material management practices or waste management practices have resulted in the release or threatened release of hazardous materials, or whether naturally occurring hazardous materials are present, which pose a threat to public health or the environment. The PEA is also applicable to releases of hazardous materials.

Specific objectives of the PEA include:

- Determining if a release of hazardous wastes/substances/materials has occurred at a site and delineating the general extent of the contamination.
- Evaluate available information for indications of naturally-occurring hazardous materials at the site.
- Estimating the potential threat to public health and/or the environment posed by the site and providing an indicator of the relative risk.
- Determining if an interim action is required to reduce an existing or potential threat to public health or the environment.
- Completing preliminary project scoping activities to determine data gaps and identify possible remedial action strategies to form the basis for development of a site strategy.
- Providing the data and information to the DTSC.
- Assessing and providing for the informational needs of the community.

SECTION 2.0: PRIOR ENVIRONMENTAL STUDIES

In 2014, Cornerstone performed Phase I and II Environmental Site Assessment (ESA) studies at the Site as part of the District's acquisition of the property (Cornerstone, 2014a, 2014b). A geotechnical investigation was also performed (Cornerstone, 2014c). Selected information from these reports is presented below. Data summary tables for the December 2014 Phase II investigation are included in Appendix C. Please refer directly to these documents for a more complete overview of the Site.

2.1 SITE HISTORY

Based on the information obtained during the Phase I ESA, the Site appears to have been undeveloped land until construction of the existing building in approximately 1962. Building plans from 1962 indicate that the building was constructed for Bucal, Inc., however, it is not known if Bucal, Inc. ever occupied the building. Scientific Products, a division of American Hospital Supply Corporation, is listed in city directories as an occupant of the building between at least 1963 and 1975. Jonker Business Machines (along with Scientific Products) also was identified as an occupant in a 1970 city directory. Bay Associates Wire Technologies, the current occupant, appears to have occupied the building since the late 1970s or early 1980s.

2.2 PHASE I ESA – NOVEMBER 2014

Provided below is a summary of potential environmental concerns identified in Cornerstone's November 5, 2014 Phase I ESA prepared for the Site.

- At the time of our study, hazardous materials used at the Site by Bay Associates consisted mainly of methyl ethyl ketone (MEK), tetrahydrofuran (THF), isopropyl alcohol (IPA) and solvent based marking inks. These materials are stored within metal flammable materials storage cabinets. Hydraulic fluid, EDM dielectric oil, EnSolv (n-propyl bromide) and cutting fluids (way oil) also were observed at the Site. Hazardous wastes are stored within a canopy-covered and fenced enclosure located along the southern exterior side of the building.

Details regarding hazardous materials use by occupants prior to Bay Associates were not identified within the data sources researched during the Phase I ESA. However, building plans from 1962 show a chemical storage room with explosion proof fixtures within the southeast corner of the building. This chemical storage room and associated fixtures were relocated to the southwest corner of the building in 1970. The presence of the former chemical storage rooms suggests that activities by prior occupants involved the use of hazardous materials.

- Based on the data reviewed, the Site appears to be located within an area where volatile organic compounds (VOCs) from an unidentified source are present in ground water. Perchloroethene (PCE) and trichloroethene (TCE) concentrations have been reported in ground water at adjacent properties at concentrations that exceeded its drinking water Maximum Contaminant Level (MCL) of 5 micrograms per liter (5 µg/L). Additional information pertaining to the regional solvent plume is presented in Section 3.3 of this PEA Report.

  The United States Environmental Protection Agency (EPA) recommends further evaluation of potential vapor intrusion concerns for buildings overlying PCE/TCE impacted ground water that exceed 5 µg/L. Vapor intrusion generally occurs when there is a migration of volatile chemicals from contaminated ground water or soil into an overlying building. Volatile chemicals such as PCE and TCE can emit vapors that may migrate as vapors through subsurface soils and into indoor air spaces of overlying buildings.

- A railroad track spur historically extended onto the southern portion of the Site. The former railroad tracks and wooden ties appear to have been removed. Assorted chemicals historically were commonly used for dust suppression and weed control along rail lines.

- Based on our review of geologic maps, the Site is located approximately 4½ miles from the nearest ultramafic rock outcrop that may contain naturally occurring asbestos (NOA).

2.3 GENERAL SOIL QUALITY

During Cornerstone's December 2014 Phase II investigation, fill and native soil samples were collected from 18 exploratory borings and were analyzed for various organic and inorganic compounds Boring locations and the selected soil samples for analyses are summarized below.

- Boring SB-1 was drilled near the existing exterior hazardous waste storage area; borings SB-2 and SB-3 were drilled near the reported former chemical storage rooms shown on 1962 and 1970 building plans; boring SB-4 was advanced at a central location inside the building where manufacturing activities are performed. Eight soil samples (two samples per boring) were collected from SB-1 through SB-4; one sample was collected from the upper approximate 1-foot of soil below the concrete floor slab or asphalt and another deeper sample was collected from approximate depths varying between 5 and 10 feet. The eight soil samples from SB-1 through SB-4 (two per boring) were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPH-gasoline) and VOCs by EPA Test Method 8260B, and TPH-diesel and TPH-oil with a silica gel cleanup by EPA Test Method 8015M. The shallow soil samples collected from borings SB-1 through SB-4 were additionally analyzed for semi-VOCs (SVOCs) by EPA Test Method 8270, California Assessment Manual (CAM) 17 metals by EPA Test Method 6010B/7471A, and polychlorinated biphenyls (PCBs) by EPA Test Method 8082.

- Borings SB-8, SB-9 and SB-10 were advanced to approximately 5 feet in the approximate area of the former rail spur alignment. One soil sample was collected from each boring from the upper approximate 1 foot of soil. The three soil samples (one per boring) were analyzed for TPH-diesel and TPH-oil with a silica gel cleanup, polycyclic aromatic hydrocarbons (PAHs) by EPA Test Method 8270SIM, CAM 17 metals, organochlorine pesticides (OCPs) by EPA Test Method 8081, and PCBs.

- To evaluate the quality of the fill, eight additional samples were collected from borings SV-1 through SV-8. The eight soil samples (one per boring) were analyzed for halogenated VOCs by EPA Test Method 8260B. The fill sample from boring SV-8 was additionally analyzed for TPH-gasoline, TPH-diesel and TPH-oil with a silica gel cleanup, SVOCs, CAM 17 metals, and PCBs.

- Additionally, four soil samples were collected from exploratory borings SV-2, SB-4, and SB-7 (one sample from SV-2 and SB-7 and two samples from SB-4) for asbestos testing using Transmission Electron Microscopy (TEM) quantitative methods with CARB 435 preparation techniques. These soil samples were collected from approximate depths varying from 2 to 7 feet.

With exception to concentrations of TPH-oil detected in 2 of 12 soil samples at 77 milligrams per kilogram (mg/kg) and 130 mg/kg (ESL[1] is 5,100 mg/kg for gross contamination) and low concentrations (i.e., less than environmental screening criteria) of TPH-diesel (detected in 6 of 12 soil samples) and anthracene (detected in 1 of 3 soil samples), no analytes were detected above their respective laboratory reporting limit. The four soil samples analyzed for asbestos using Transmission Electron Microscopy (TEM) quantitative methods with CARB 435 preparation techniques did not detect asbestos above the laboratory reporting limit (0.0001% weight asbestos) in the selected soil samples. The detected metal concentrations appear typical of natural background and/or less than their respective residential screening criteria.

Based on the analytical data, soil quality at the locations sampled near the former rail spur line and fill soil placed at the Site does not appear significantly impacted. Additionally, NOA does not appear to be a significant concern at the Site.

As noted, one soil sample collected from the boring advanced near the exterior hazardous waste storage area (SB-1) detected TPH-oil at 130 mg/kg. Note that its residential ESL for direct exposure human health concerns is 11,000 mg/kg.

2.4 GENERAL GROUND WATER QUALITY

Laboratory analyses of the grab ground water samples collected from the exploratory borings during Cornerstone's December 2014 investigation did not detect SVOCs, BTEX compounds (benzene, toluene, ethylbenzene, and xylenes), gasoline-range total petroleum hydrocarbons (TPH-gasoline), fuel oxygenates and/or other VOCs above their respective laboratory reporting limits except for 1,1-dichloroethene (1,1-DCE) and TPH-diesel/oil. 1,1-DCE was detected in 4 of 8 grab ground water samples at concentrations ranging from 1.2 micrograms per liter (µg/L) to 2.1 µg/L; its drinking water MCL[2] is 6 µg/L. The 1,1-DCE detections were found in the grab ground water samples collected from the borings advanced along a hypothetical line extending from the approximate northwest corner to southeast corner of the property (SB-5, SB-4, SB-3, and SB-8). The source of 1,1-DCE detected in the grab ground water samples is likely associated with the ground water solvent plume reported in the regional area. 1,1-DCE is a breakdown product of PCE, TCE and cis-1,2-dichloroethene (cis-1,2-DCE). As discussed in Section 3.3 of this PEA Report, these compounds have been detected on properties north and south of the Site. Regulatory agencies have not identified a responsible party for the solvent release(s).

TPH-oil was detected in 3 of 8 grab ground water samples at concentrations of 350 µg/L, 800 µg/L, and 1,000 µg/L, respectively. The greatest concentrations were detected from the two borings advanced near

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[1] Detected soil contaminants were compared to DTSC-recommended residential Screening Levels (DTSC-SLs) presented in the DTSC Office of Human and Ecological Risk (HERO) guidance document *Human Health Risk Assessment (HHRA) Note 3* updated January 2016 (HERO, 2016). If a DTSC-SL is not established, the soil results were compared to residential Regional Screening Levels (RSLs) established by USEPA Region 9 (USEPA, 2015). For detected chemicals for which RSLs have not been established, Environmental Screening Levels (ESLs) established by the San Francisco Bay Regional Water Quality Control Board (Water Board, 2016) were used for comparison. Metal concentrations were also compared to regional published background concentrations (Scott, 1991; Bradford, 1996; LBNL, 2009; and Duverge, 2011).

[2] Detected contaminants in ground water were compared to Maximum Contaminant Levels (MCLs) established by State Water Resources Control Board (September 2015). For detected chemicals for which MCLs have not been established, ESLs established by the San Francisco Bay Regional Water Quality Control Board (Water Board, 2016) were used for comparison.

the southeast corner of the Site (SB-3 and SB-8); TPH-diesel also exceeded its ESL of 100 µg/L in these two samples. Note that only low to non-detectable concentrations of TPH-diesel/oil were reported in the three soil samples collected from the upper approximate 10 feet from borings SB-3 and SB-8. This data indicates a significant soil source likely does not exist at these locations.

The source of the TPH-affected ground water is not known but may be associated with possible localized minor spills/releases and/or associated with an off-Site release. Moderate and heavy-range petroleum hydrocarbons are relatively immobile in the environment and typically are limited in extent. The TPH-impacted ground water would be expected to degrade over time due to natural attenuation processes. These impacts do not appear to pose a significant risk to human health in a school setting.

2.5 GENERAL SOIL VAPOR QUALITY

To assist in evaluating potential vapor intrusion concerns, during Cornerstone's December 2014 investigation co-located sub-slab and subsurface soil vapor samples were collected at eight locations inside the on-Site building. The sub-slab samples were collected in the aggregate material immediately below the concrete floor slab. The subsurface samples were collected from approximate depths of 5 or 10 feet. An outdoor ambient air sample was also collected to assist in evaluating outdoor air quality.

Laboratory analyses of the eight sub-slab and eight subsurface soil vapor samples detected several VOCs; however, no chlorinated VOCs associated with the regional solvent plume (i.e., PCE/TCE and their breakdown products) were detected above their respective laboratory reporting limits.

Following CalEPA and DTSC guidance, the detected VOCs were compared to calculated sub-slab and subsurface screening criterion that are 20 times (attenuation factor = 0.05) and 1,000 times (attenuation factor = 0.001) the indoor air RSL, respectively. For example, the residential (unrestricted use) indoor air DTSC-SL for benzene is 0.097 micrograms per cubic meter (µg/m^3). The calculated sub-slab and subsurface screening levels for benzene are 1.94 µg/m^3 and 97µg/m^3, respectively. None of the detected VOCs exceeded their respective calculated environmental screening criteria with exception of benzene and chloroform.

Benzene concentrations in the eight subsurface soil vapor samples ranged from 5 to 220 µg/m^3 with two samples exceeding its calculated screening level of 97 µg/m^3. Both of the elevated benzene concentrations were reported in the soil vapor samples collected within the building from an approximate depth of 10 feet below the elevated concrete floor slab. Benzene was not detected above its laboratory reporting limit in the eight sub-slab soil vapor samples. As noted above, benzene also was not detected in the eight grab ground water samples and selected soil samples collected at the Site.

The source of benzene detected in the subsurface soil vapor samples is not known; however, based on the available data and comparison to the selected screening criteria used by DTSC, the elevated benzene concentrations in soil vapor do not appear to be a Site-wide concern. Additionally, oxygen concentrations in the sub-slab vapor samples ranged from 16 to 20 percent and may explain why benzene was not detected above its laboratory reporting limit in the sub-slab samples. Petroleum hydrocarbon vapors will naturally degrade in an aerobic environment thus reducing the potential for petroleum hydrocarbon vapor intrusion concerns.

Chloroform was detected in 2 of 8 sub-slab soil vapor samples at concentrations of 5.5 µg/m^3 (SV-1) and 18 µg/m^3 (SV-5); its calculated screening level is 2.4 µg/m^3. Chloroform was not detected above its laboratory reporting limit in the eight subsurface soil vapor samples. Similar to benzene, chloroform also was not detected in the eight grab ground water samples and selected soil samples collected at the Site, including the soil samples collected from the SV-1 and SV-5 borings. The source of the chloroform detected in the subsurface vapor samples is not known but may be associated with indoor air contamination inside the building associated with the existing tenant operations. Ambient barometric pressure forces can transfer indoor air across the floor slab via cracks and/or penetrations and into underlying soil. This natural process may also explain the occurrence of other VOCs detected at low concentrations in the soil vapor samples.

SECTION 3.0: AREAS OF CONCERN REQUIRING FURTHER EVALUATION

This section presents the areas of potential concern requiring further evaluation that were identified during the District's scoping meeting with DTSC on June 16, 2015. A sampling and analyses plan to evaluate these areas of concern was presented in Cornerstone's Revised PEA Work Plan that was approved by DTSC in their letter dated November 30, 2015.

3.1 PEST CONTROL AND LEAD-BASED PAINT RESIDUE

Due to the age of the existing building, there is a potential that termiticides may have been sprayed near building foundations. Organochlorine pesticides were commonly used as insecticides for termite control around structures (DTSC, 2006). Since termiticides typically were applied adjacent to building foundations, the pesticide concentrations generally are highest closest to the exterior wall and decrease laterally away from the structures. Additionally, based on the age of the existing building, possible past lead-based paint (LBP) residue may have impacted shallow soil quality. Weathering, scraping, chipping, and abrasion could cause lead to be released to and accumulate in soil near the structure.

3.2 POLYCHLORINATED BIPHENYLS (PCB) TRANSFORMER

A PG&E transformer is located near the northeast corner of the Site. There is a potential that PCBs may have been historically used within the transformer. PCBs are man-made chemicals commonly used in the past as coolants and lubricants. PCBs are found as a clear to yellow, heavy oily liquid or waxy solid. PCBs were frequently used as insulation in electrical equipment because of their stability, low water solubility, high boiling point, low flammability, and low electrical conductivity. Prior to 1978, PCBs were often used in the manufacture of transformers and capacitors, and leaks or releases from transformers producing contaminated areas have been documented. The age of the transformer does not necessarily indicate the presence or absence of impacts to soil from PCBs, as releases of PCBs from a previous transformer may have occurred before its replacement. Once released to the environment, PCBs bind to soil particles and are very persistent.

Additionally, potential sources of PCBs in buildings constructed or renovated between approximately 1950 and 1979 include caulking used around windows, door frames, building joints, masonry columns and other masonry building materials. Based on the information obtained during the Phase I ESA, the Site appears to have been developed with the existing building in approximately 1962. PCB-containing caulk may be present on the exterior of the building as well as in surrounding surfaces.

3.3 REGIONAL VOC GROUND WATER PLUME

Based on the information sources reviewed during Cornerstone's Phase I ESA, the Site appears located in an area where chlorinated VOCs from an unidentified off-Site source are present in ground water. A responsible party has not yet been identified by the regulatory agencies. Provided below is a summary of prior environmental studies performed on nearby properties where chlorinated VOCs in ground water have been reported.

A former warehouse building on the 149 Commonwealth Drive property reportedly was used exclusively for liquor storage and office space. In 1987, two ground water monitoring wells (MW-1 and MW-2) were installed on the 149 Commonwealth Drive property. VOCs, predominantly TCE at 630 µg/L, were detected in ground water from well MW-2 located on the northeast portion of the property. Beta Associates (1987) subsequently installed four additional ground water monitoring wells (MW-3 to MW-6). TCE was reported at up to 925 µg/L, predominantly in MW-2 and MW-6; well MW-6 was located on the adjacent property east of MW-2. Beta Associates concluded that, based on the data and knowledge of the property history, the VOC contamination appears to originate from an off-property source.

During the late 1980s and early 1990s, TCE was detected at up to 2,300 µg/L (in MW-6) during subsequent sampling of ground water from the wells. During these sampling events, a southeasterly ground water flow direction was reported. However, as discussed in Section 4.2 of this PEA report, general regional ground water flow towards the north to northeast is anticipated.

In October 1998, the Water Board issued a no further action letter for the 149 Commonwealth Drive property that stated the following: *Groundwater monitoring data over the past seven years has indicated the presence of low levels of VOCs in shallow groundwater. Board staff agree that these chemicals most likely originate from an up gradient and off-site source. Concentrations of these compounds have decreased significantly within this period of time and currently only TCE is detectable in one well, MW-2, at a concentration of 5.3 µg/L. Additionally, the concentration of pollutants currently detected in groundwater beneath the property, whether they be from on- or off-site, do not represent a significant threat to water quality. Based on the information presented to the Board, and with the provision that the information provided to this agency was accurate and representative of site conditions, no further actions are required on the subject property.*

The San Mateo County Department of Environmental Health (DEH) files also contained a proposal prepared by EMCON in 1990 for the installation of ground water monitoring wells at 155 Jefferson Drive (located across Jefferson Drive to the northeast of the Site). EMCON noted that four soil borings were previously drilled along the perimeter of the 155 Jefferson Drive property and soil and ground water were sampled. The samples reportedly were analyzed for chlorinated VOCs and aromatic VOCs. Chlorinated VOCs reportedly were detected in the ground water from three of the four borings; the laboratory results were not described. EMCON stated that the property is in an area of Menlo Park that has ground water contamination known to exceed California drinking water MCLs for VOCs and that the source of ground water contamination is unknown.

The DEH files also contained a Water Board no further action letter for 141 Jefferson Drive, located across Jefferson Drive from the Site. The letter states that low levels of VOCs were detected in ground water at 141 Jefferson Drive, including PCE at 11 µg/L, cis-1,2-DCE at 33 µg/L and Freon 113 at 8 µg/L.

3.4 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).

Radon potential maps are provided in the 2014 California Geological Survey (CGS) Special Report 226, titled *Radon Potential in San Mateo County, CA (CGS 2014).* These maps were prepared based upon 1) indoor-radon data; 2) National Uranium Resource Evaluation (NURE) airborne equivalent uranium (eU) data; and 3) Natural Resources Conservation Service (NRCS) soil data for permeability and shrink-swell character. Based on the maps, the Site is not located in a “High” or “Moderate” zone having potential for indoor radon levels to exceed the federal EPA action level. The Site is located in the “Unknown” radon zone. Geologic units with insufficient data from within San Mateo County and from previous studies were assigned “unknown” radon potential.

SECTION 4.0: ENVIRONMENTAL SETTING

4.1 PHYSICAL SETTING

A 1997 USGS 7.5 minute topographic map was reviewed to evaluate the physical setting of the Site. The Site’s elevation is approximately 10 feet above mean sea level; topography in the vicinity of the Site slopes downward gently to the northeast towards the San Francisco Bay.

4.2 GEOLOGY AND HYDROGEOLOGY

The Site is located within the Santa Clara Valley, which is a broad alluvial plane between the Santa Cruz Mountains to the southwest and west, and the Diablo Range to the northeast. The San Andreas Fault system, including the Monte Vista-Shannon Fault, exists within the Santa Cruz Mountains and the Hayward and Calaveras Fault systems exist within the Diablo Range.

Based on Cornerstone’s subsurface investigation, the concrete slab section for the existing raised building consisted of approximately 5 to 11 inches of concrete over approximately 4 feet of fill. The fill consists of varying amount of clay, sand, and gravel. The northern at-grade administrative office space consisted of approximately 6 inches of concrete over 3 inches of sand and 3 inches of coarse gravel fill followed by approximately 1½ feet of fill consisting of sandy clay with gravel. Exterior surface pavements generally consisted of 3 to 4 inches of asphalt concrete over approximately 3 inches of aggregate base.

Native subsurface materials observed below fill and aggregate base consisted of several feet of very stiff to hard fat clay underlain by medium stiff to hard lean clay with varying amounts of sand. Increased sand and gravel content were observed at approximately 14 feet below the asphalt pavement grade at several boring locations; free ground water was observed in this layer.

Ground water was observed at depths ranging from approximately 11 to 16 feet below the asphalt pavement surface. All measurements were taken at the time of drilling and may not represent the stabilized levels that can differ from the initial levels encountered. Regional ground water flow is assumed to be in the north-northeast direction toward the San Francisco Bay; however, variable flow directions have been reported.

4.3 EXPOSURE PATHWAYS

Exposure pathways are the mechanisms by which a receptor (e.g. construction worker or future site user) may contact contaminants of concern at the Site. Exposure pathways consist of three parts: (1) a source of contaminants, (2) an exposure point where the receptor may come into contact with contaminants (e.g. contaminated soil, drinking water, and/or indoor air), and (3) an exposure route (e.g. dermal, ingestion, and/or inhalation).

As discussed in Section 3, contaminants of potential concern (COPC) in shallow soil consist of organochlorine pesticides, lead, and PCBs. The physical characteristics of the COPC in soil at the Site make them relatively persistent and immobile. These COPC typically do not readily dissolve in water and migrate to ground water, as they readily adsorb to soil particles. The COPC will not readily volatilize or migrate as vapors. The COPC are expected to persist in surface soil with the highest concentrations located near the surface. These chemicals may migrate if adsorbed to soil particles that become entrained into ambient air as a result of wind erosion of surface soil.

As is typical to most regional VOC ground water contamination plumes, volatilization of contaminants located in the subsurface soils and ground water and the subsequent mass transport of these vapors into indoor spaces constitute a potential inhalation exposure pathway.

Since Site ground water is not currently used for drinking water purposes, and the VOC-impacted ground water beneath the Site is associated with off-Site sources, the ground water exposure pathway is not complete and does not need to be further evaluated.

4.4 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) was developed to assist in understanding Site conditions and potential pathways by which humans may be exposed to contaminants of concern at the Site. The CSM is based on the known Site history and results of the data collected at the Site to date. An exposure pathway is considered complete if it presents a means of exposure to a receptor. A complete exposure pathway includes all of the following: a source of contamination, release mechanism, transport mechanism, exposure point, and a receptor. Figure 4 presents the CSM for the Site.

SECTION 5.0: IMPLEMENTATION OF PEA WORK PLAN

5.1 PRE-FIELD ACTIVITIES

Approximately 7 days before starting field work, the District issued a DTSC-approved Field Work Notice to neighboring businesses within line of sight of the school property. A copy of the notice is included in Appendix A.

5.2 SOIL SAMPLING

On December 9, 2015, Cornerstone's field engineer implemented the soil sampling and analyses plan presented in the DTSC-approved Revised PEA Work Plan. Table 1 presented below summarizes the soil sample handling and testing requirements; Table 2 presents the implemented sampling and analysis activities. Approximate sampling locations are shown on Figure 2.

Table 1. Soil Sample Handling and Testing Requirements

Chemical(s)	Test Method	Minimum Reporting Limits*	Preservative	Hold Times
OCPs	8081A	2 µg/kg 40 µg/kg for Chlordane	4º C	14 Days
PCBs	8082A	50 µg/kg	4º C	14 Days
Lead	6010B	0.5 mg/kg	4º C	180 Days

* For samples with no dilution. Reporting limits may be higher for samples that require dilution due to elevated COC.

Table 2. Soil Sampling and Analysis Activities

Boring ID	Sample Location	Sample Depth (feet)	Sample Analysis: Lead	Sample Analysis: OCPs	Sample Analysis: PCBs	Area of Concern (AOC)
SB-11	West of Existing Building	0-0.5	X	X		LBP Residue, Pest Control
	West of Existing Building	2-2.5		X		Pest Control
SB-12	North of Existing Building	0-0.5	X	X	X	LBP Residue, Pest Control, PCBs
	North of Existing Building	2-2.5		X	X	Pest Control, PCBs
SB-13	East of Existing Building	0-0.5	X	X		LBP Residue, Pest Control
	East of Existing Building	2-2.5		X		Pest Control
SB-14	Near PG&E Transformer	0-0.5			X	PCBs
	Near PG&E Transformer	2-2.5			X	PCBs
SB-15	Near PG&E Transformer	0-0.5			X	PCBs
	Near PG&E Transformer	2-2.5			X	PCBs
ANALYSES TOTALS			3	6	6	

5.2.1 Soil Sampling Methods

The subsurface exploration program was performed using Direct Push technology equipped with the Dual Wall Sampling System. The Dual Wall Sampling System helps prevent cross contamination between sampling intervals. The Dual Wall Sampler is comprised of two main components: an exterior steel casing and an inner sample barrel. The outer casing has a 2-inch outer diameter (OD) and a 1.5-inch inner diameter (ID). The sample barrel is 5 feet in length with a 1.375-inch outside diameter (OD) and a 1-inch inner diameter (ID). The Dual Wall sample barrel was loaded with a 5-foot acetate liner and installed inside the outer casing. The outer drive casing and inner sample barrel were then hydraulically pushed to a depth of approximately 5 feet. As these tools were advanced, the inner sampling barrel collected the soil core sample. This sampler was then retrieved while the outer casing remained in place, protecting the integrity of the hole. Where borings extended below 5 feet, a new sampler was lowered into place and advanced another 5 feet to collect the next soil sample. This process continued until the desired depth was reached. Our field engineer continuously logged the borings in general accordance with the Unified Soil Classification System (ASTM D-2487). All borings were sealed to the surface with cement grout upon completion of sampling activities.

The ends of the liners were covered in Teflon film, fitted with plastic end caps, and labeled with a unique identification number. The samples were then placed in an ice-chilled cooler and transported to a state-certified analytical laboratory with chain of custody documentation.

All sampling equipment was cleaned using distilled water and a Liquinox solution prior to use at each sample point. Additionally, separate exterior steel casing and inner sample barrel were used at each boring location.

5.3 SOIL VAPOR SAMPLING

Between December 9, 2015 and December 21, 2015 Cornerstone's field engineer and geologist implemented the soil vapor sampling and analyses plan presented in the DTSC-approved Revised PEA Work Plan. Subsurface soil vapor samples were collected at two exterior locations (SV-9 and SV-10) and three building interior locations (SV-2, SV-3, and SV-7). The two exterior soil vapor probes were installed south and north of the existing building, respectively. The three interior soil vapor probes (SV-2A, SV-3A, and SV-7A) were installed near previous subsurface vapor probes (SV-2, SV-3, and SV-7) that were installed and sampled during Cornerstone's December 2014 investigation.

Table 3 presented below summarizes the soil vapor sample handling and testing requirements. Approximate sampling locations are shown on Figure 2.

Table 3. Soil Vapor Sample Handling and Testing Requirements

Chemical(s)	Test Method	Minimum Reporting Limits*	Hold Times
VOCs	TO-15	See Appendix F	30 Days
Fixed Gases (carbon dioxide, methane, and oxygen)	D-1946	0.023% for carbon dioxide 0.0003% for methane 0.23% for oxygen	30 Days

5.3.1 Temporary Subsurface Soil Vapor Probe Installation

Following completion of concrete coring activities, on December 9, 2015 our C-57 licensed drilling contractor used limited access drilling equipment to advance the soil vapor probes to varying depths below the asphalt pavement surface. To help limit potential soil consolidation caused by Direct Push drilling activities, hand auger equipment was used to extend the bottom section of each boring to its desired depth. Boring and well construction details are included in Appendix D.

The subsurface probes consisted of a stainless steel expendable vapor tip and screen installed at an approximate depth of 5 feet below the asphalt pavement surface; the vapor tip was affixed to stainless steel tubing. The vapor probes were constructed by first placing approximately 2 inches of coarse aquarium sand into the bottom of the borehole using a tremie pipe. The stainless steel tip and tubing was then lowered into the borehole via a tremie pipe. Additional sand was then placed in the borehole via tremie to create an approximately 1 foot sand pack interval around the vapor tip. Approximately 1 foot of granular bentonite (Benseal™) was placed on top of the sand pack via the tremie pipe. Bentonite "gel" was placed via tremie pipe on top of the dry granular bentonite to 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. A construction cone was placed over the probe until purging and sampling was performed.

5.3.2 Soil Vapor Purging and Sampling Methods

Due to low permeability clays beneath the Site, purging was performed in two steps. Approximately six days after probe installation, on December 15, 2015 the downhole shut off valve was opened and one purge volume of vapor was removed using a 1-liter summa canister. The volume of vapor removed was verified by the calculated pressure drop in the summa canister. The purge volume was calculated based on the length and inner diameter of the sampling probe, the connected sampling tubing and equipment, dry bentonite seal, and the borehole sand pack. At least three days after the initial purging, we returned to the Site for additional purging followed by sampling. Except at location SV-10, the purge volume during the second event was calculated similar to the first event. Due to observed back pressure at location SV-10, the purging volume was calculated based on the connected sampling tubing and equipment; the sand pack was excluded.

During the second round of purging then sampling, a 167 milliliters-per-minute flow regulator inclusive of particulate filter was fitted to the shut off valve and the other end to a "T" fitting. One end of the "T" was connected to the sampling summa canister. The other end of the "T" was affixed to a digital vacuum gauge and a 1-liter summa canister utilized for purging. Prior to 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. Purging began 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).

Pentane was used as the leak detection compound during sampling by applying the pentane gas into the shroud atmosphere. Sampling began by opening the summa canister valve. Immediately upon opening the sampling valve, a shroud was placed over and enclosed the atmosphere of the borehole and entire sampling train including all connections.

Soil vapor sampling continued until limited vapor flow was observed and/or until the vacuum gauge indicated approximately 5 inches of Hg remaining. A data logging photoionization detector (PID) was utilized during sampling to monitor the atmosphere inside the shroud through a bulk head fitting. The logged data (at minimum thirty [30] second intervals) was corrected to parts per million by volume pentane concentrations and utilized to evaluate the integrity of the sampling train.

To confirm the pentane atmosphere, one confirmation sample was collected from the shroud atmosphere through the sampling port of the PID. The confirmation sample was collected using a summa connected to a flow controller within the shroud during sample collection. All field data, including equilibrium time, purge volume calculations and leak check measurements were recorded.

5.3.3 Temporary Probe Destruction Methods

Upon completion of soil vapor sampling activities and receipt of the analytical results, the soil vapor probes were removed and the boreholes were sealed to the surface with cement grout.

5.4 DISCUSSION OF RESULTS

5.4.1 Environmental Screening Levels

The soil and soil vapor sampling results collected during this PEA investigation were compared to residential DTSC-SLs. If a DTSC-SL has not been established, the soil results were compared to RSLs.

HERO HHRA Note 3 does not include environmental screening levels for comparison to subsurface soil vapor data. To evaluate potential vapor intrusion concerns, HERO recommends using the DTSC guidance document Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air dated October 2011 (DTSC, 2011). The indoor air residential DTSC-SLs were adjusted using the attenuation factors provided in the DTSC guidance. For this study, the future residential building type attenuation factor of 0.001 was used to calculate subsurface screening criterion.

5.4.2 Summary of Soil Analytical Data

The soil analytical results of the PEA investigation are presented in Table 4 in the Tables Section of this report. Analytical data sheets and chain of custody documentation are included in Appendix E. A brief discussion of the soil results is provided below.

- Lead was detected in 3 of 3 soil samples at concentrations up to 9.9 mg/kg, below its residential screening criteria of 80 mg/kg. The detected concentrations also appear within range of typical natural background.

- OCPs and PCBs were not detected above their respective laboratory reporting limits in the selected soil samples.

5.4.3 Summary of Soil Vapor Analytical Data

The analytical results of the soil vapor samples are summarized below and in Table 5 in the Tables section of this report. Chain of custody documentation and laboratory analytical datasheets are presented in Appendix E.

- Benzene was detected in 4 of 5 soil vapor samples at concentrations ranging from 4.2 $\mu g/m^3$ (SV-9) to 23 $\mu g/m^3$ (SV-7A). The detected concentrations are below the subsurface screening criterion for benzene of 97 $\mu g/m^3$.

- Toluene was detected in 5 of 5 soil vapor samples at concentrations ranging from 7.3 µg/m^3 (SV-2A) to 33 µg/m^3 (SV-9). The detected concentrations are below the subsurface screening criterion for toluene of 310,000 µg/m^3.

- Ethylbenzene was detected in 5 of 5 soil vapor samples at concentrations ranging from 12 µg/m^3 (SV-3A) to 130 µg/m^3 (SV-9). The detected concentrations are below the subsurface screening criterion for ethylbenzene of 1,100 µg/m^3.

- 1,1,1-TCA was detected in 2 of 5 soil vapor samples at concentrations of 6.3 µg/m^3 (SV-3A) and 45 µg/m^3 (SV-7A). The detected concentrations are below the subsurface screening criterion for 1,1,1-TCA of 1,000,000 µg/m^3.

- PCE was detected in 3 of 5 soil vapor samples at concentrations ranging from 9.3 µg/m^3 (SV-9) to 29 µg/m^3 (SV-3A). The detected concentrations are below the subsurface screening criterion for PCE of 480 µg/m^3.

- Other VOCs were less frequently detected in the vapor samples including 1,1-DCE, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 2,2,4-trimethylpentane, 2-butanone (MEK), 4-ethyl toluene, acetone, carbon disulfide, cyclohexane, freon 113, heptane, hexane, isopropanol, isopropylbenzene, n-propylbenzene, o-xylene, and ethanol. These detected compounds did not exceed their respective calculated screening criterion.

- Leak detection compound pentane was detected in 3 of 5 soil vapor samples with concentrations ranging from 15 µg/m^3 to 180 µg/m^3.

- Oxygen concentrations in the five soil vapor samples ranged from 6.8 percent to 16 percent with the lowest concentrations detected in the sample collected from the subsurface probe installed at location SV-3A. Carbon dioxide levels ranged from 3.4 percent to 15 percent with the greatest concentrations detected in the SV-3A subsurface sample probe.

5.5 QUALITY ASSURANCE & QUALITY CONTROL

5.5.1 Field Duplicates

The field QA/QC procedures consisted of field duplicate collection and analysis. Field duplicate samples are two co-located samples of the same matrix, collected in the same approximate location and time, and similar overall homogeneity. Analysis of field duplicates provides a quantitative measure of the variability of the overall sampling and laboratory analysis process due to sample heterogeneity, sampling techniques, and/or analytical methods. The soil field duplicates were assigned a different sample ID but were packaged and transported in the same manner as the primary samples.

For this investigation, one field duplicate soil and soil vapor sample were collected from selected sampling locations. The soil field duplicate sample FD-1 was collected from sampling location SB-12 from approximately 2 to 2½ feet. The soil vapor field duplicate sample SV-3A (DUP) was collected from sampling location SV-3A.

As shown in Table 4, OCPs and PCBs were not detected in the soil sample field duplicate pair. The calculated average relative percent difference (RPD) of the two soil vapor samples was 24 percent. The RPD for the soil vapor field duplicate pair is within range of the EPA TO-15 method criteria for laboratory standard analysis.

5.5.2 Equipment Blank

Equipment blank samples are collected prior to sampling activities by pouring analyte free water (deionized water) over or through decontaminated field sampling equipment. Analysis of equipment blanks evaluate the adequacy of the decontamination process and assess contamination from the total sampling, sample preparation process, when decontaminated sampling equipment is used to collect samples. For this investigation, one equipment blank (EB-1) was collected from the hand sampling equipment used for soil sampling. The equipment blank was collected from sampling equipment following soil sampling activities at SB-12. Analytical results of the equipment blank did not detect OCPs and PCBs above their respective laboratory reporting limits.

5.5.3 Integrity of Soil Vapor Data

To help confirm the sampling trains were sufficiently tight and the soil vapor data is representative of subsurface conditions, one confirmation sample of the shroud atmosphere was collected by utilizing a 250 mL summa and micro flow controller connected to a bulkhead fitting through the shroud during sampling at soil vapor location SV-3A. Laboratory analyses of the shroud atmosphere sample detected pentane at 580,000 µg/m^3. During the same sampling time period (approximately 2.5 minutes), the shroud atmosphere was measured by the PID to range from approximately 300,000 µg/m^3 to 600,000 µg/m^3 with an average concentration of 461,747 µg/m^3 (approximately 23 percent relative percent difference [RPD] below the laboratory reported value). The PID appeared to slightly underestimate the shroud atmosphere.

Pentane was detected in 3 of 5 soil vapor samples above laboratory reporting limits; reporting limits ranged from 12 µg/m^3 to 14 µg/m^3. The maximum pentane detection in the soil vapor samples (180 µg/m^3 at SV-10) was used to estimate the maximum leakage rate, if any. The average shroud concentration of pentane measured with the PID during sampling at SV-10 was approximately 176,000 µg/m^3. The calculated maximum approximate leakage rate based on the detected concentration of 180 µg/m^3 pentane was 0.1%. This data indicates that the sample trains appeared sufficiently tight for soil vapor sample collection and no significant leakage occurred.

5.5.4 Sample Receipt and Handling

Sample handling and documentation was reviewed during the data quality assessment and included evaluating chain-of-custody documentation, technical sample integrity, preservation, and technical holding times. Samples were delivered to the analytical laboratory with proper chain-of-custody documentation. Sample cooler temperatures for samples submitted to Test America were recorded at the time of sample receipt. After transfer of sample custody to the laboratories, the samples were placed in storage refrigerators, maintaining a temperature of 6° Celsius or below. The analytical testing was performed within the technical holding times for sample preparation and analyses.

5.5.5 Laboratory Quality Control

Upon completion of field work, samples were delivered with proper chain-of-custody documentation to Test America Inc. and Eurofins AirToxics, a state-certified analytical laboratory. The analytical laboratory QA/QC program included sample receipt verification, sample hold times, and the preparation and analysis of laboratory QC samples. Test America Inc. and Eurofins AirToxics laboratory QC samples included method blanks, laboratory control samples, matrix spike and matrix spike duplicates, and surrogate recoveries.

5.5.6 Data Validation

To help confirm the validity of the analytical data, Level II data validation was performed for the analytical data received from Test America Inc. and Eurofins AirToxics. Data validation is a sample-specific process implemented to determine the quality of a given data set beyond the method specification, determines any causes for non-conformance to the standard method, and verifies that the reported results are within acceptable ranges. The data evaluation was performed by third-party consultant Laboratory Data Consultants, Inc. (LDC) in Carlsbad, California. The data validation process did not reject the analytical results. The Level II Data Validation package is included in Appendix F.

SECTION 6.0: HUMAN HEALTH RISK SCREENING EVALUATION

Cornerstone retained Mr. Greg Brorby with ToxStrategies, Inc., a Diplomate of the American Board of Toxicology (DABT) to perform a human health screening level evaluation in general accordance with the methods outlined in DTSC's PEA Guidance Manual (DTSC, 2015). Except for the sub-slab soil vapor data and soil data representative of the fill beneath the raised warehouse, analytical results from Cornerstone's December 2014 Phase II investigation were included in the evaluation. Because of the planned demolition of the existing building, removal of the fill underlying the raised floor slab, and construction of a new at-grade school building, the December 2014 sub-slab vapor data and fill data were excluded.

The screening human health risk evaluation outlined in the PEA Guidance Manual is intended to be a health-conservative evaluation of potential risks posed by chemicals at a site. For example, this evaluation assumes a site will be used for residential purposes regardless of actual or intended land use. Non-cancer hazard quotients (HQs) and incremental lifetime cancer risks (ILCRs) are estimated using an established human health risk-based residential screening concentration and the maximum detected concentration for each chemical as follows:

$$\text{HQ} = \text{Maximum concentration/Screening concentration}$$

$$\text{ILCR} = (\text{Maximum concentration/Screening concentration}) \times 10^{-6}$$

Where:

> The screening concentrations are based on a target HQ of one and a target ILCR of one-in-a-million (1×10^{-6}).

The chemical-specific HQs and ILCRs are each summed, regardless of the location of the maximum detected concentrations, to estimate the total non-cancer hazard index (HI) and total ILCR, respectively. If the total HI exceeds a value of one, then HIs are re-calculated by summing HQs for chemicals affecting the same target organ (e.g., respiratory effects).

The screening concentrations used in this evaluation are RSLs for residential land use (Hazard Quotient [HQ] =1), modified as necessary based on HERO HHRA Note 3. The soil screening levels assume exposure via incidental soil ingestion, dermal contact with soil, and inhalation of vapors or resuspended particulates in ambient air. The soil vapor screening concentrations are based on DTSC-SLs for ambient air divided by a soil vapor to indoor air attenuation factor (AF) of 0.001 as recommended by DTSC for new buildings. RSLs were used in the event a DTSC-SL was not established for a specific analyte. DTSC-SLs and/or RSLs are available for the majority of compounds detected in soil and soil vapor samples at the Site. When necessary, surrogate compounds were identified based on similarity in chemical structure or physical characteristics. The RSL for trivalent chromium, rather than hexavalent chromium, was used to evaluate total chromium detected in soil because, as noted above, total chromium concentrations are consistent with regional background.

As discussed in Section 2.3, TPH-diesel and TPH-oil were detected in several soil samples during Cornerstone's 2014 investigation. EPA has not developed RSLs for these petroleum hydrocarbon mixtures; therefore, in accordance with the PEA Guidance Manual, ESLs developed by the Water Board were used.

Additionally, lead typically is evaluated separately using the LeadSpread model; however, because the maximum detected concentration is less than the DTSC screening level of 80 mg/kg (which is based on LeadSpread), no further assessment of lead was performed.

The estimated noncancer HQs and ILCRs for the individual chemicals detected in soil are shown in the risk table included in Appendix G. To provide context for this evaluation, risk estimates were calculated for two cases: 1) all analytes detected above their respective method detection limit; and 2) all analytes detected but excluding metals because the reported metal concentrations appear consistent with regional natural background.

The majority of the non-cancer HQs and ILCRs for detections in soil are equal or less than the target HQ and ILCR of one and 1×10^{-6}, respectively; however, the HQ for two metals (arsenic and thallium) and the ILCR for arsenic, is above their respective target. As noted above, the detected metal concentrations appear consistent with regional background. When the HQs and ILCRs for metals are excluded, the HI is 0.2, and the ILCR is 8×10^{-7}.

The individual non-cancer HQs for chemicals detected in soil vapor are less than one, and the total HI is 0.3. The individual ICLRs for chemicals detected in soil vapor are less than 1×10^{-6}, except for benzene (2×10^{-6}). Note that the benzene concentration driving this risk calculation is from a soil vapor sample collected in November 2014 (220 µg/m^3). The soil vapor collected at the same general location and depth in December 2015 detected benzene at 13 µg/m^3. The total ILCR is 5×10^{-6}.

The cumulative non-cancer HI assuming exposure to chemicals in soil (excluding the naturally-occurring metals) and soil vapor is 0.5. The cumulative ILCR is 5×10^{-6}.

Based on the risk calculations, and considering the conservative nature of this screening level evaluation, ToxStrategies, Inc. concluded that potential exposure to future Site occupants via incidental soil ingestion, dermal contact with soil, inhalation of particulates or vapors in ambient air, and inhalation of vapors in indoor air as a result of vapor intrusion will not result in a public health risk under the conditions evaluated.

SECTION 7.0: PUBLIC PARTICIPATION

In accordance with Education Code, Section 17213.1, the District prepared a public notice and made the draft PEA report (dated March 15, 2016) available for public review and comment from March 30, 2016 to April 30, 2016. The notice was placed in the San Mateo County Times newspaper on March 30, 2016. The notice, draft PEA report, and DTSC's PEA comments letter dated April 12, 2016 were also placed in the Menlo-Park Public Library and at the District office. Additionally, the project was included on the agenda for District board meeting on April 20, 2016. No comments were received.

Copies of the public notice and DTSC PEA comments letter are included in Appendix A.

SECTION 8.0: CONCLUSIONS AND RECOMMENDATIONS

During this PEA investigation, soil and soil vapor sampling was performed to address the areas requiring further evaluation identified in the DTSC-approved PEA Work Plan. Soil samples were collected near the existing building to evaluate potential impacts from possible pest control spraying near the building perimeter, and potential impacts from building materials such as lead-based paint and/or PCB caulking compounds. Additionally, soil samples were collected near the existing PG&E transformer since there is a potential that PCBs may have been historically used within the transformer. Soil vapor sampling was performed to evaluate potential vapor intrusion concerns associated with the VOCs reported in ground water beneath the regional area from unidentified off-Site sources. As shown in Tables 4 and 5, laboratory analyses of the soil and soil vapor samples collected during this investigation did not detect COPC above residential (unrestricted use) environmental screening criteria.

As part of this study, a human health screening level evaluation was performed in general accordance with the methods outlined in DTSC's PEA Guidance Manual. This evaluation considered analytical results obtained during this PEA investigation and Cornerstone's 2014 study. Excluding the naturally-occurring metals, the cumulative non-cancer HI was estimated at 0.5, below the target HQ of one specified in the PEA Guidance Manual. The ILCR was estimated at five-in-a-million (5×10^{-6}) and slightly exceeds the target ILCR of one-in-a-million (1×10^{-6}). It should be noted, however, that this risk calculation is driven by the benzene concentration detected in a soil vapor sample collected in November 2014 (220 µg/m^3). Laboratory analyses of the soil vapor collected at the same general location and depth during this PEA investigation detected benzene at 13 µg/m^3. Similar low concentrations were detected in the other soil vapor samples (up to 23 µg/m^3). Additionally, oxygen concentrations in the soil vapor samples collected in November 2014 and December 2015 ranged from 6.8 to 20 percent, indicating aerobic conditions. Petroleum hydrocarbon vapors, like benzene, will naturally degrade in an aerobic environment thus reducing the potential for petroleum hydrocarbon vapor intrusion concerns. Furthermore, to provide a higher level of protection to future occupants against potential VOC vapor and radon gas intrusion, the District is planning to voluntarily install an impermeable vapor barrier and ventilation system beneath the planned classroom building.

Based on the results of this PEA, the Site does not pose a significant risk to human health and the environment and appears suitable to accommodate the District's school redevelopment plans. We recommend DTSC consider a "No Further Action" determination for the Site.

SECTION 9.0: LIMITATIONS

This report, an instrument of professional service, was prepared for the sole use of Sequoia Union High School District and the Department of Toxic Substances Control 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. 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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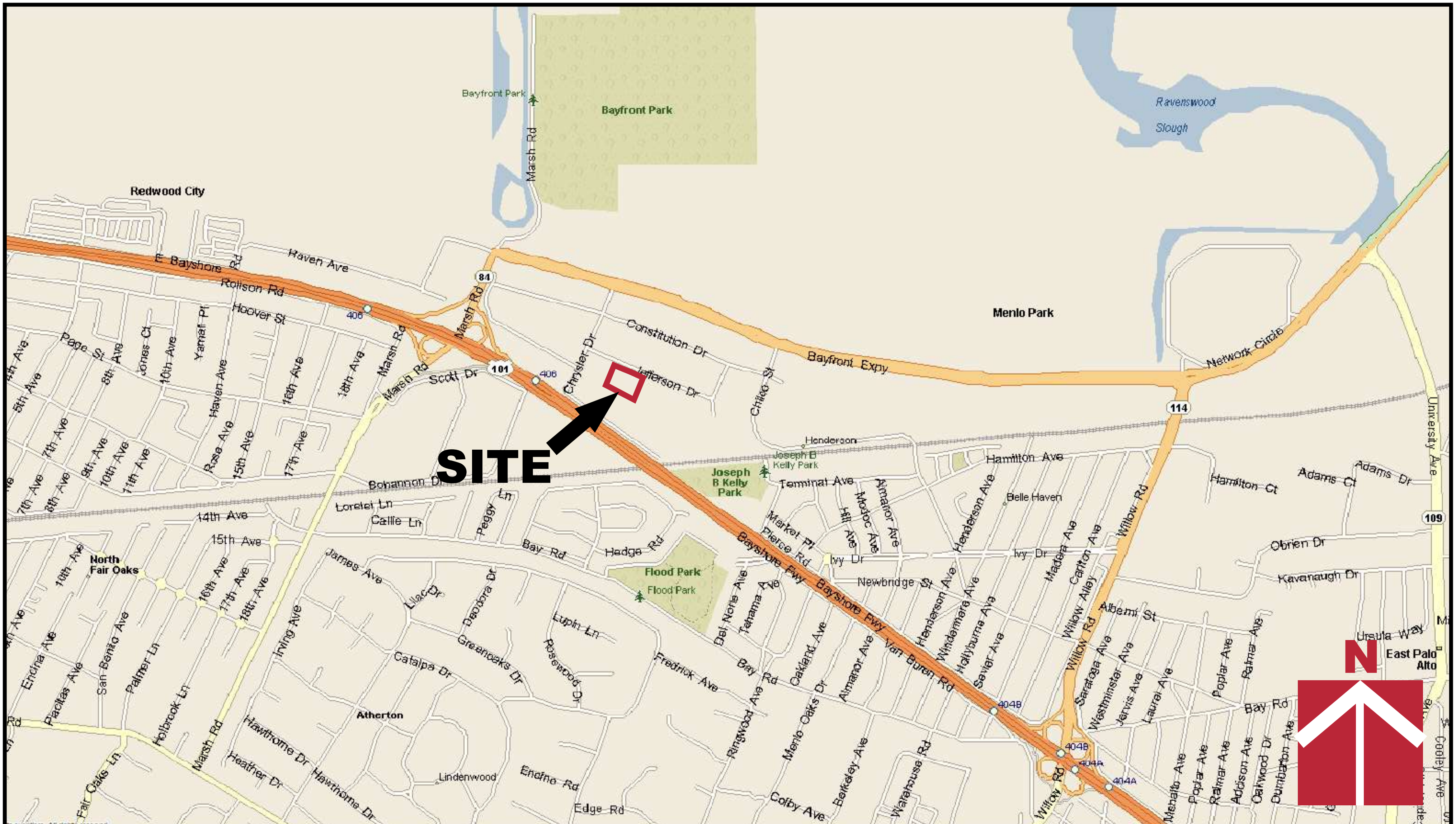
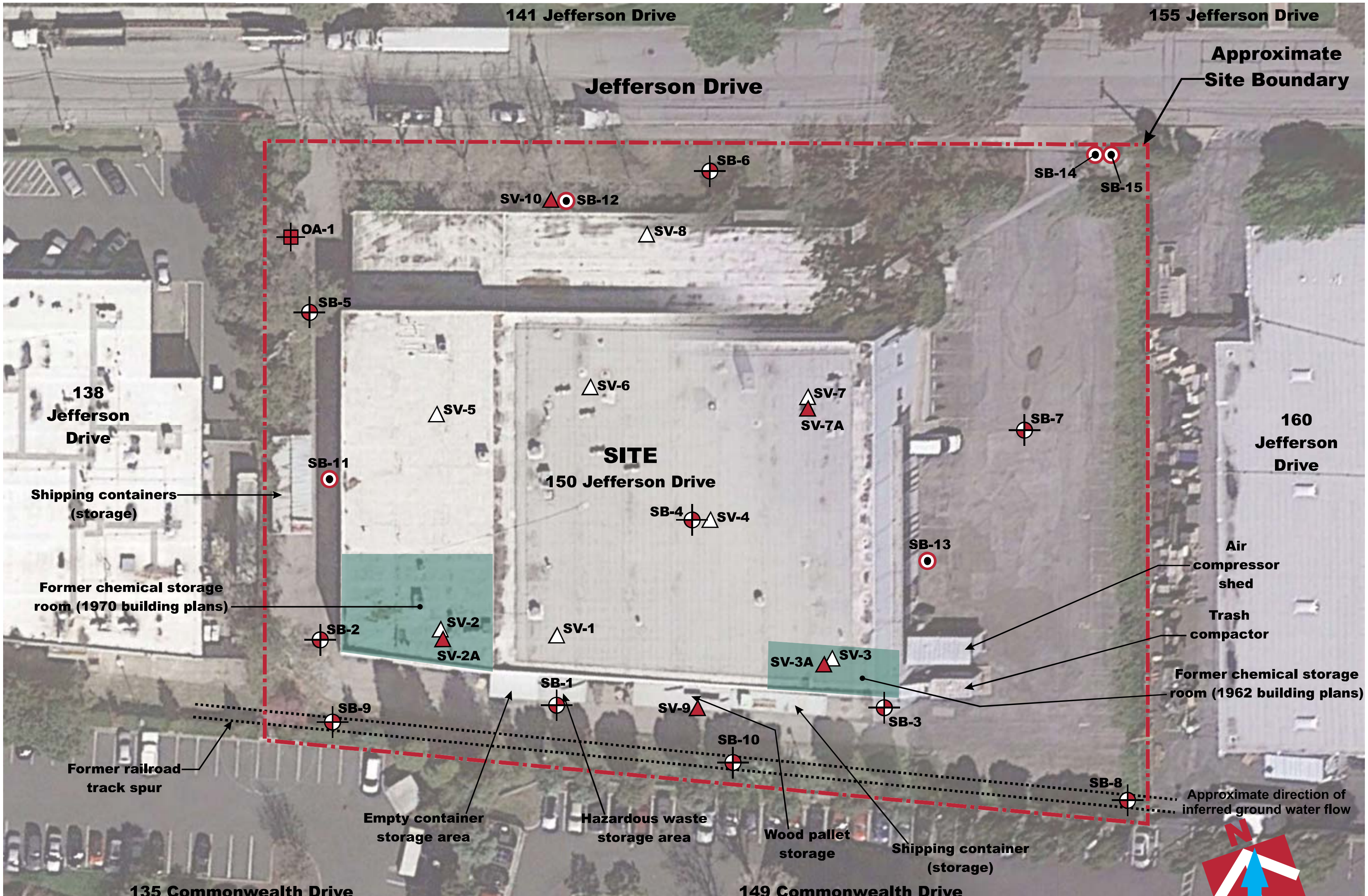


CORNERSTONE EARTH GROUP	Vicinity Map	Project Number 166-14-8
	150 Jefferson Drive Menlo Park, CA	Figure Number Figure 1
		Date March 2016 / Drawn By RRN



Legend

- Approximate location of soil and/or ground water boring (SB) (December, 2014)
- Approximate location of subsurface and sub-slab vapor probe (SV) (December, 2014)
- Approximate location of outdoor air sample (OA) (December, 2014)
- Approximate location of subsurface vapor probe (SV)
- Approximate location of soil boring (SB)

0 40 80
APPROXIMATE SCALE (FEET)

Base by Google Earth, dated 2/23/2014

CORNERSTONE EARTH GROUP

Site Plan with PEA Sampling Locations

150 Jefferson Drive
Menlo Park, CA

Project Number	166-14-8
Figure Number	Figure 2
Date	March 2016
Drawn By	RRN

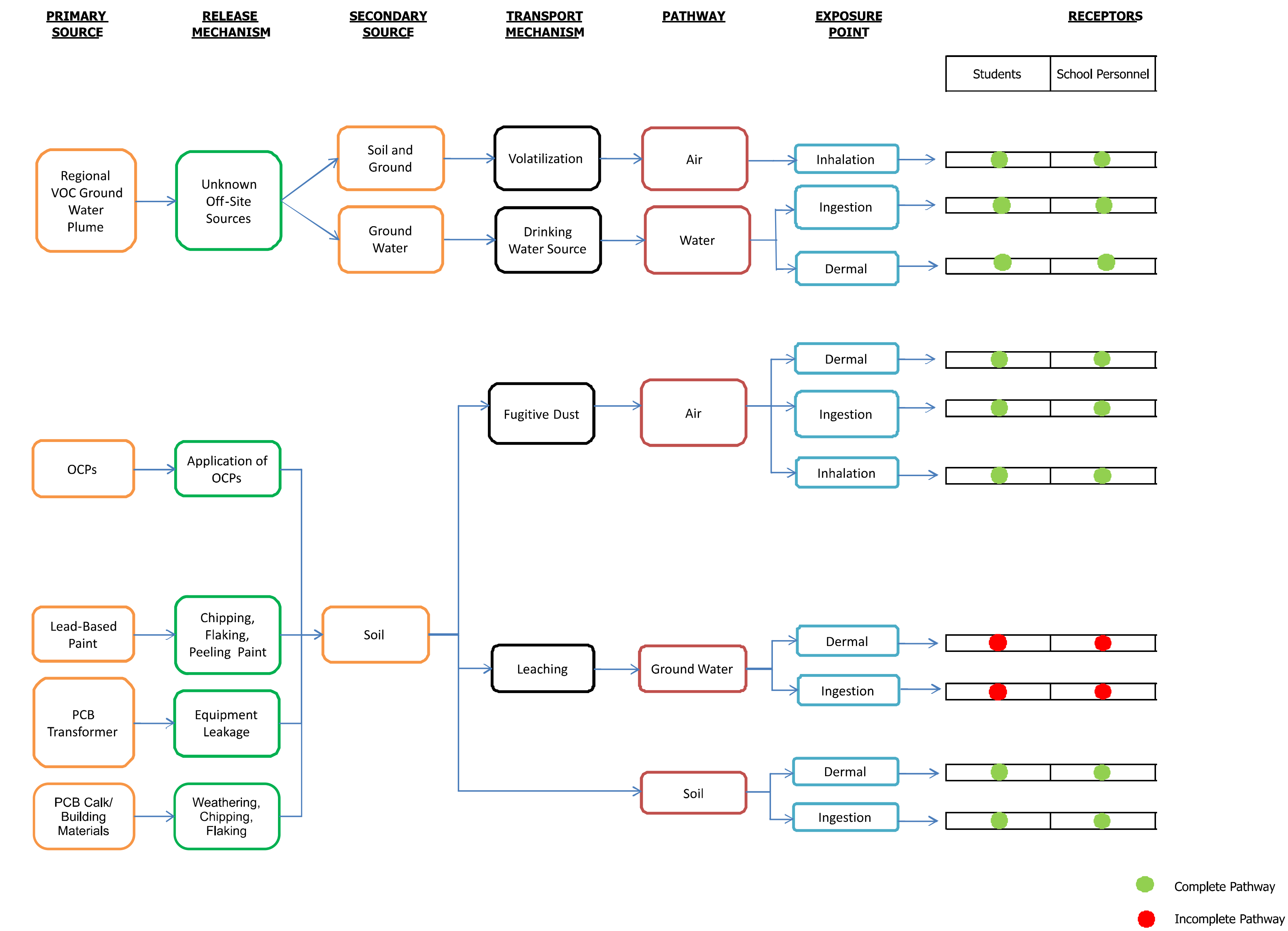
Base by TRA, Conceptual Site Plan - Figure 3, undated

CORNERSTONE EARTH GROUP

Proposed Development

150 Jefferson Drive
Menlo Park, CA

Project Number	Figure Number	Date	Drawn By
166-14-8	Figure 3	March 2016	RRN



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Conceptual Site Model

150 Jefferson Drive
Menlo Park, CA

Project Number	Figure Number	Date	Drawn By
166-14-8	Figure 4	March 2016	RRN

Table 4. Analytical Results of Soil Samples - Lead
(Concentrations in mg/kg)

Sample Location	Boring ID	Sample ID	Date	Depth (feet)	Lead
West of Existing Building	SB-11	SB-11 (0-0.5)	12/9/2015	0-½	7.4
North of Existing Building	SB-12	SB-12 (0-0.5)	12/9/2015	0-½	9.9
East of Existing Building	SB-13	SB-13 (0-0.5)	12/9/2015	0-½	8.8
RSL[1] - HQ=1 (Residential)	Carcinogenic Risk Screening Level				400
	Non-Cancer Child Hazard				NE
DTSC-SL - (Residential)	Cancer				NE
	Noncancer				80

1 Regional Screening Level (RSL), USEPA Region 9 - November 2015.
NE Not Established
--- Not Analyzed
DTSC Recommended Screening Level (SL), HERO Note 3 - January 2016

CORNERSTONE EARTH GROUP

Table 5. Analytical Results of Soil Samples - OCPs
(Concentrations in mg/kg)

Sample Location	Boring ID	Sample ID	Date	Depth (feet)	4,4´-DDD	4,4´-DDE	4,4´-DDT	DDT Total	Aldrin	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	delta-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC	gamma-Chlordane	Heptachlor	Heptachlor epoxide	Methoxychlor	Toxaphene
West of Existing Building	SB-11	SB-11 (0-0.5)	12/9/2015	0-½	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.04	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.04
		SB-11 (2-2.5)	12/9/2015	2-2½	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.039	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.039
North of Existing Building	SB-12	SB-12 (0-0.5)	12/9/2015	0-½	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.039	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.039
		SB-12 (2-2.5)	12/9/2015	2-2½	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.039	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.039
	SB-12 Field Dup.	FD-1 (2-2.5)	12/9/2015	2-2½	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.039	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.039
East of Existing Building	SB-13	SB-13 (0-0.5)	12/9/2015	0-½	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.039	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.039
		SB-13 (2-2.5)	12/9/2015	2-2½	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.039	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.039
RSL[1] - HQ=1 (Residential)	Carcinogenic Risk Screening Level				2.30	2	1.90	NE	0.04	NE	NE	NE	1.70	NE	0.03	NE	NE	NE	NE	NE	NE	0.57	NE	0.13	0.07	NE	0.49
	Non-Cancer Child Hazard				NE	NE	37	NE	2.30	NE	NE	NE	34	NE	32	NE	NE	NE	1.90	NE	NE	21	NE	39	1.00	320	NE
DTSC-SL (Residential)	Cancer				NE	NE	NE	NE	NE	NE	NE	NE	0.43	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
	Noncancer				NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

1 Regional Screening Level (RSL), USEPA Region 9 - November 2015.
< Not detected at or above laboratory reporting limit
NE Not Established
--- Not Analyzed
DTSC Recommended Screening Level (SL), HERO Note 3 - January 2016

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Table 6. Analytical Results of Soil Samples - PCBs
(Concentrations in mg/kg)

Sample Location	Boring ID	Sample ID	Date	Depth (feet)	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
North of Existing Building	SB-12	SB-12 (0-0.5)	12/9/2015	0-½	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049
		SB-12 (2-2.5)	12/9/2015	2-2½	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048
	SB-12 Field Dup.	FD-1 (2-2.5)	12/9/2015	2-2½	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049
Near PG&E Transformer	SB-14	SB-14 (0-0.5)	12/9/2015	0-½	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049
		SB-14 (2-2.5)	12/9/2015	2-2½	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049
	SB-15	SB-15 (0-0.5)	12/9/2015	0-½	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049	<0.049
		SB-15 (2-2.5)	12/9/2015	2-2½	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048	<0.048
RSL[1] - HQ=1 (Residential)	Carcinogenic Risk Screening Level				6.70	0.20	0.17	0.23	0.23	0.24	0.24
	Non-Cancer Child Hazard				4.10	NE	NE	NE	NE	1.20	NE
DTSC-SL (Residential)	Cancer				NE	NE	NE	NE	NE	NE	NE
	Noncancer				NE	NE	NE	NE	NE	NE	NE

1 Regional Screening Level (RSL), USEPA Region 9 - November 2015.
< Not detected at or above laboratory reporting limit
NE Not Established
--- Not Analyzed
DTSC Recommended Screening Level (SL), HERO Note 3 - January 2016

CORNERSTONE EARTH GROUP

Table 7. Analytical Results of Soil Vapor Samples - VOCs
(Concentrations in µg/m³)

Sample Location	Boring ID	Sample ID	Date	Approximate Probe Depth (feet below existing street grade)	Benzene	Toluene	Ethylbenzene	1,1 - DCE	1,1,1-TCA	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2,2,4-Trimethylpentane	2-Butanone (MEK)	4-Ethyl Toluene	Acetone	Carbon Disulfide	m,p-Xylene
Inside West Former Chemical Storage Area	SV-2A	SV-2A	12/21/2015	5	9.9	7.3	25	<4.6	<6.3	18	7.6	<5.4	<14	20	<28	<14	140
Inside East Former Chemical Storage Area	SV-3A	SV-3A	12/21/2015	5	13	7.8	12	<4.5	6.3	14	<5.6	<5.3	<14	13	<27	<14	55
	SV-3A Field Dup.	SV-3A(DUP)	12/21/2015	5	14	6.9	8.7	<4.5	<6.2	11	<5.6	<5.3	<13	10	<27	<14	40
Inside Northeast Manufacturing Area	SV-7A	SV-7A	12/21/2015	5	23	24	52	4.8	45	22	11	<5.3	14	33	54	<14	260
South of Existing Building	SV-9	SV-9	12/18/2015	5	4.2	33	130	<4.4	<6.0	69	25	21	<13	80	<26	<14	650
North of Existing Building	SV-10	SV-10	12/18/2015	5	<3.4	32	110	<4.2	<5.7	110	36	12	<12	120	26	21	590
RSL[1] - HQ=1 (Residential)	Indoor Air Carcinogenic Risk Screening Level				0.36	NE	1.1	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
	AF=0.001[2] (Indoor Air / Subsurface Soil Gas)				3.6E+02	NE	1.1E+03	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
	Indoor Air Noncancer Hazard				31	5200	1000	210	5200	7.3	NE	NE	5200	NE	32,000	730	100
	AF=0.001[2] (Indoor Air / Subsurface Soil Gas)				3.1E+04	5.2E+06	1.0E+06	2.1E+05	5.2E+06	7.3E+03	NE	NE	5.2E+06	NE	3.2E+07	7.3E+05	1.0E+05
DTSC-SL (Residential)	Ambient Air Cancer				0.097	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
	AF=0.001[2] (Indoor Air / Subsurface Soil Gas)				97	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
	Ambient Air Noncancer				3.1	310	NE	73	1,000	NE	42	NE	NE	NE	NE	NE	NE
	AF=0.001[2] (Indoor Air / Subsurface Soil Gas)				3.1E+03	3.1E+05	NE	7.3E+04	1.0E+06	NE	4.2E+04	NE	NE	NE	NE	NE	NE

1 Regional Screening Level (RSL), USEPA Region 9 - November 2015.
2 Calculated "contaminant source" screening level using an Attenuation Factor (AF) = 0.001 for future residential building type (DTSC, 2011)
< Not detected (ND) at or above laboratory reporting limit (RL)
NE Not Established
DTSC Recommended Screening Level (SL), HERO Note 3 - January 2016

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Table 7. Analytical Results of Soil Vapor Samples - VOCs
(Concentrations in µg/m³)

Sample Location	Boring ID	Sample ID	Date	Approximate Probe Depth (feet below existing street grade)	Cyclohexane	Freon 113	Heptane	Hexane	Isopropanol	Isopropylbenzene	n-Propylbenzene	o-xylene	PCE	Ethanol	Pentane	Carbon Dioxide (%)	Methane (%)	Oxygen (%)
Inside West Former Chemical Storage Area	SV-2A	SV-2A	12/21/2015	5	<4.0	<8.9	<4.8	<4.1	18	<5.7	6	40	<7.9	<8.7	<14	6.4	<0.00023	14
Inside East Former Chemical Storage Area	SV-3A	SV-3A	12/21/2015	5	<3.9	<8.8	<4.7	<4.0	12	<5.6	<5.6	18	29	<8.6	18	15	<0.00023	6.8
	SV-3A Field Dup.	SV-3A(DUP)	12/21/2015	5	<3.9	<8.7	<4.6	<4.0	<11	<5.6	<5.6	15	27	<8.5	58	15	<0.00023	6.9
Inside Northeast Manufacturing Area	SV-7A	SV-7A	12/21/2015	5	<3.9	50	5.8	<4.0	31	9.9	10	71	9.8	17	15	6.2	<0.00023	13
South of Existing Building	SV-9	SV-9	12/18/2015	5	7	<8.5	33	7.4	<11	21	25	150	9.3	<8.4	<13	3.4	<0.00022	16
North of Existing Building	SV-10	SV-10	12/18/2015	5	5.2	<8.0	18	4	130	26	36	160	<7.1	29	180	5.6	<0.00021	16
RSL[1] - HQ=1 (Residential)	Indoor Air Carcinogenic Risk Screening Level				NE	NE	NE	NE	NE	NE	NE	NE	11	NE	NE	NE	NE	NE
	AF=0.001[2] (Indoor Air / Subsurface Soil Gas)				NE	NE	NE	NE	NE	NE	NE	NE	1.1E+04	NE	NE	NE	NE	NE
	Indoor Air Noncancer Hazard				6300	31,000	NE	730	210	420	1000	100	42	NE	1000	NE	NE	NE
	AF=0.001[2] (Indoor Air / Subsurface Soil Gas)				6.3E+06	3.1E+07	NE	7.3E+05	2.1E+05	4.2E+05	1.0E+06	1.0E+05	4.2E+04	NE	1.0E+06	NE	NE	NE
DTSC-SL (Residential)	Ambient Air Cancer				NE	NE	NE	NE	NE	NE	NE	NE	0.48	NE	NE	NE	NE	NE
	AF=0.001[2] (Indoor Air / Subsurface Soil Gas)				NE	NE	NE	NE	NE	NE	NE	NE	4.8E+02	NE	NE	NE	NE	NE
	Ambient Air Noncancer				NE	NE	NE	NE	NE	NE	NE	NE	37	NE	NE	NE	NE	NE
	AF=0.001[2] (Indoor Air / Subsurface Soil Gas)				NE	NE	NE	NE	NE	NE	NE	NE	3.7E+04	NE	NE	NE	NE	NE

1 Regional Screening Level (RSL), USEPA Region 9 - November 2015.
2 Calculated "contaminant source" screening level using an Attenuation Factor (AF) = 0.001 for future residential building type (DTSC, 2011)
< Not detected (ND) at or above laboratory reporting limit (RL)
NE Not Established
DTSC Recommended Screening Level (SL), HERO Note 3 - January 2016

APPENDIX G4:

JANUARY 2015 PIPELINE SAFETY HAZARD ASSESSMENT

January 2015 | Pipeline Safety Hazard Assessment

New School Site in Menlo Park

for Sequoia Union High School District

Prepared for:

Cornerstone Earth Group
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1259 Oakmead Parkway
Sunnyvale, California 94085
408.245.4600

Project Number:
CEGR-05

Prepared by:

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PLACEWORKS

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1. Introduction

1.1 PURPOSE

This report presents the results of a pipeline safety hazard assessment (PSHA) prepared for the proposed school site located at 150 Jefferson Drive, Menlo Park, California. The PSHA evaluates potential exposure and fatality risk to students and staff from underground or at-grade natural gas or hazardous liquid pipeline releases and the potential for flooding from large volume water pipelines.

1.2 SCHOOL SITE LOCATION

The Sequoia Union High School District is considering acquisition of an approximately 2-acre parcel located at 150 Jefferson Drive in Menlo Park, San Mateo County, California for a new school site. The property is bounded on the north by Jefferson Drive and on the east, south, and west by commercial/manufacturing properties (Figure 1).

1.3 REGULATORY REQUIREMENTS

Under Education Code Section 17251, the California Department of Education (CDE) has authority to approve acquisition of proposed school sites. The school district must obtain CDE approval for sites to receive state funds under the state's School Facilities Program administered by the State Allocation Board. CDE standards and regulations for this process are presented in California Code of Regulations, Title 5, Sections 14010, 14011, and 14012. Information on assessing safety hazard related to pipelines is discussed in Section 14010 (h):

> *The site shall not be located near an above-ground water or fuel storage tank or within 1,500 feet of the easement of an above-ground or underground pipeline that can pose a safety hazard as determined by a risk analysis study, conducted by a competent professional, which may include certification from a local public utility commission.*

By CDE policy, "any pipeline that has a maximum operating capacity of at least 80 pounds per square inch (psi), including but not limited to those that carry natural gas, liquid petroleum, fuels or hazardous chemicals, shall be included in a pipeline survey, regardless if the pipeline is classified as a transmission or distribution line. Pipelines located within a railroad or other easement or those pipelines serving gas and oil well sites and fields shall also be included".

Additional information on pipelines is contained in CDE's School Site Selection and Approval Guide. This document states that CDE will not approve a proposed school site if the site "contains one or more pipelines, situated underground or aboveground, which carries hazardous substances, acutely hazardous materials, or hazardous wastes, unless the pipeline is a natural gas line which is used only to supply natural gas to that school or neighborhood" (CDE, 2004).

The CDE's School Site Selection and Approval Guide also contain provisions for evaluating high-pressure water pipelines:

> *To ensure the protection of students, faculty, and school property if the proposed school site is within 1,500 feet of the easement of an aboveground or underground pipeline that can pose a safety hazard, the school district should obtain the following information from the pipeline owner and operator:*
>
> - *Pipeline alignment, size, type of pipe, depth of cover*
> - *Operating water pressures in pipelines near the proposed school site*
> - *Estimated volume of water that might be released from the pipeline should a rupture occur on the site*
> - *Owner's assessment of the structural condition of the pipeline.*

1.4 REPORT OBJECTIVES

To meet the requirements of CCR Title 5 Sections 14010 (d) and (h) and CDE's policy on pipelines, this PSHA is designed to meet the following objectives:

- Identify all natural gas and hazardous liquid pipelines located within 1,500 feet of proposed or existing school sites
- Complete a Stage 1, Stage 2, or Stage 3 risk analysis for each identified pipeline to predict fatality risk
- Where appropriate, identify and develop mitigation measures to reduce predicted fatality risk to a level below an established significance threshold
- Identify all high pressure/large volume water pipelines within 1,500 feet of the proposed school site and evaluate the potential for flooding
- Where appropriate, identify and develop mitigation measures to reduce flooding impacts to acceptable levels.

1.5 ASSESSMENT METHODOLOGY

The CDE has recently developed and published guidance procedures for evaluating safety hazards associated with natural gas and hazardous liquid releases from underground and aboveground pipelines. A detailed description of the procedures is provided in the Guidance Protocol for School Site Pipeline Risk Analysis (CDE, 2007). These procedures were used in conducting the PSHA.

The PSHA process is composed of two steps. The first step (Stage 1) is a risk screening analysis (RSA), based on the distance of the pipeline(s) from the school site and operating characteristics of the pipeline(s). If the screening criteria are met, the level of risk is acceptable and no further analysis is required.

1. Introduction

If the screening criteria are not met, then the second step of the PSHA process is completion of a Stage 2 quantitative risk analysis (QRA). The Stage 2 risk analysis considers pipeline accident rates, school dimensions, conditional probabilities for ignition, school attendance time, and fatality probabilities for different exposure scenarios (pool fire, flash fire, and explosion) to estimate individual risk (IR). Pipelines located within 50 feet of a school site also are subject to a Stage 3 (more comprehensive) analysis to verify the results of the Stage 2 evaluation.

Individual fatality risk is compared to the significance threshold level of one in one million (1.0 x 10-6). If the estimated risk is less than one in one million, then no significant safety hazard is predicted for the school site. If the estimated risk is greater than one in one million, mitigation measures are required to reduce risk to within acceptable limits or a more detailed Stage 3 risk analysis can be conducted.

In addition to individual risk, an estimate of the potential risk for the population present at the school site is determined by calculating the total individual risk (TIR) indicator ratio and the population risk indicator. These parameters add an additional perspective by taking into account the site configuration and school population. There is no significance threshold established by the CDE for this evaluation, and this does not replace the IR estimate as the primary decision criteria for evaluating risk at the school site. However, it does provide additional information regarding the magnitude of risk at the school.

The CDE also has developed risk analysis procedures for evaluating flooding associated with releases from large diameter water pipelines, as described in CDE's Guidance Protocol for School Site Pipeline Risk Analysis (CDE, 2007). A safety issue associated with large diameter water pipelines is the potential for flooding. Also, releases from underground water pipelines can cause subterranean erosion of saturated soil, leading to subsidence or formation of a sinkhole. The most likely cause of failure is a large magnitude earthquake and associated strong ground shaking.

Although no specific criteria have been established by the CDE as a threshold of significance for flooding at a school site, a water depth of 12 inches or greater is a trigger that could warrant further evaluation, (CDE, 2007).

2. Hazard Assessment

2.1 PIPELINE LOCATION AND OPERATIONAL DATA

There is one natural gas transmission pipeline within 1,500 feet of the school site. No hazardous liquid pipelines were identified within 1,500 feet of the site (NPMS, 2015). The location of this pipeline is shown on Figure 1.

Natural gas pipeline data were obtained from Pacific Gas & Electric Company (Mr. Steven Liu, 2015). A 20-inch natural gas transmission pipeline (designated as Line 101) is located along the southwest side of Highway 101 and is approximately 700 feet southwest of the school site at its nearest location. The pipeline in the vicinity of the school site was installed in 1957. The maximum allowable operating pressure (MAOP) of this pipeline is 400 pounds per square inch (psig) and the normal operating pressure is 365 psig. To be conservative, the MAOP was used in this analysis.

Line 101 runs 34 miles from Milpitas Terminal in Santa Clara County to the San Francisco Gas Load Center in San Francisco. The pipeline is constructed of steel and has a wall thickness of 0.3125 inch in the vicinity of the school site. It is wrapped with tape or extru-coat plastic and equipped with an induced current cathodic protection system to minimize corrosion and is buried at least 36 inches below ground surface (bgs). The pipeline is patrolled quarterly and a leak survey is conducted annually. Also, the cathodic protection rectifiers are inspected annually and the pipe-to-soil potentials are measured six times per year. Although portions of this pipeline are scheduled for replacement in Palo Alto to upgrade the pipeline for in-line inspection, the pipeline segment within the City of Menlo Park has been recently inspected and does not require replacement or repairs. The 20-inch PG&E pipeline is inspected in accordance with Federal (49 CFR 192) and State (CPUC General Order 112-E) regulations. For this analysis, it was conservatively assumed that all of the natural gas in the pipeline between two isolation valves (assumed to be a distance of 5 miles) is released in the vicinity of the school site.

There are several large volume (>12 inches in diameter) water pipelines within 1,500 feet of the school site, according to the Menlo Park Municipal Water District (2015) and CalWater (2015). The pipelines are identified in the following table, including pipeline diameter, street location, and material of construction. The locations of these pipelines are also shown on Figure 1.

Pipeline Diameter	Water Purveyor	Pipeline Location	Material of Construction
12-inch	Menlo Park Municipal Water District	Jefferson Drive	Asbestos Cement (AC)
12-inch	Menlo Park Municipal Water District	Chrysler Drive	Asbestos Cement (AC)
12-inch	Menlo Park Municipal Water District	Connector across Highway 101	Asbestos Cement (AC)
12-inch	Menlo Park Municipal Water District	Connector from Jefferson Drive to Chilco Street	Ductile Iron (DI)
12-inch	California Water Services Company	Connector between Bohannon Drive and Menlo Park Municipal Water District line	Asbestos Cement (AC)

2.2 LAND USE AND TERRAIN

Surrounding land use consists primarily of commercial/industrial properties. There are several multi-story buildings and structures that could partially block or buffer vapor releases or jet flames if an incident were to occur involving the natural gas pipeline located across Highway 101. Potential ignition sources may include motor vehicles traveling along the adjacent streets, traffic signals, overhead high voltage lines, and residential/commercial gas heating units.

2.3 RELEASE AND CONSEQUENCE SCENARIOS

In accordance with the CDE Guidance Protocol, two conservative release scenarios were evaluated: 1) a rupture or large volume release equal to the pipeline's diameter, and 2) a leak or small volume release from a 1-inch diameter hole. Three potential consequences were evaluated for each release scenario: 1) jet flame, 2) flash fire, and 3) explosion.

2.4 STAGE 2 RISK ANALYSIS

Although most of the criteria for a Stage 1 screening analysis are met by this pipeline (i.e., less than 24 inches in diameter, pressure 400 psig or less, and the pipeline is more than 600 feet from the school site), the pipeline segment length within the 1,500-foot radius is greater than 1,000 feet. Therefore, a Stage 2 risk analysis is warranted to determine the cumulative individual risk (IR) to students and staff at the proposed school. The input data and risk calculations associated with this PSHA are provided in Appendix A.

2.5 STAGE 2 RISK CALCULATION RESULTS

Risk calculation results for the natural gas pipeline are provided in Appendix A. The calculated individual risk (IR) for this pipeline is provided below:

- 20-inch Natural Gas Transmission Pipeline – Southwest of Highway 101 – 1.3×10^{-9}

Since the calculated risk is less than one in a million (1.0×10^{-6}), which is the TIR criterion specified in the CDE manual, the risk is considered to be less than significant.

As part of the Stage 2 analysis, population risk indicators also were determined for the proposed school site, based on the protocol presented in the CDE manual. The school site was divided into three zones (Zones 1 through 3), with each zone approximately 83 feet wide. The TIR was calculated for each zone and compared to the TIR calculated for the nearest property boundary to the pipeline (i.e., TIR Indicator Ratio). The calculations for the TIR ratios for the pipelines are provided in Appendix A and are summarized in the table below:

Pipeline	***TIR***	***TIR/IRC Ratio***	***TIR Indicator Ratio***
20-inch natural gas transmission pipeline – 101	1.3E-09	0.00	0.82

There are no significance thresholds established by CDE for the TIR/IRC ratio, or TIR indicator ratio. These values are simply used by CDE reviewers as guidelines to determine the relative potential risk at a school site.

This PSHA report is being prepared as part of a property acquisition process. Therefore, there currently are no site plans or grading plans that show the locations of proposed classrooms, playfields, buildings, or parking lots. As a result, the population risk estimates could not be calculated but will be provided at a later date, if requested by CDE.

2.6 WATER PIPELINE FLOODING ANALYSIS

In addition to natural gas and hazardous liquid pipelines, the CDE requires that the risk of releases from high volume water pipelines be evaluated. The CDE Guidance Protocol for School Pipeline Risk Analysis provides a methodology for evaluating the potential for flooding. A probability analysis is not required.

For the water pipelines located beneath streets, a pipeline flooding analysis was conducted to determine the depth and location of water flow within the street in the event of a pipeline leak or rupture. For this worst-case analysis, it was conservatively assumed that all of the water flowing through the pipelines at their maximum capacity would reach the surface. In addition, no credit was taken for the presence of storm drains along these streets.

Release impacts were calculated based on the procedures specified in the CDE manual. The release rate was determined by multiplying the pipe area by an assumed velocity of 5 feet per second (fps). Then the release rate was compared to the carrying capacity of the street to determine if the water would be contained within the confines of the street curbing (Jeffers & Associates, 2006). The results are provided in the following table:

Pipeline Diameter (in)	Pipeline Location	Release Rate (cfs)	Street Width (ft)	Depth of Flow in Street (in)	Exceeds Street Carrying Capacity?
12-inch	Jefferson Drive	3.9	42	4.2	No
12-inch	Chrysler Drive	3.9	38	4.2	No

Assuming a standard 6-inch or 8-inch curb, the water released from a full-flow rupture of any of the water mains would be contained within the confines of the street curbing and would not result in flooding at the school site.

For the water pipelines which are not located beneath streets, the modeling approach from the CDE guidance manual assumes that all of the released water at a maximum flow rate reaches the surface and forms a circular pool with a water depth of 12 inches. The results are summarized on the following page:

Pipeline Diameter (in)	***Pipeline Location***	***Release Rate (cfs)***	***Impact Distance for Circular Pool (ft)***	***Distance from School Site (ft)***	***Impacts School Site?***
12	Connector across Highway 101	3.90	39	520	No
12	Connector from Jefferson Drive to Chilco Street	3.90	39	995	No
12	Connector between Bohannon Drive and Menlo Park Municipal Water District line	3.90	39	800	No

The results indicate that released water from water mains that are not located in the street right-of-ways would also not result in flooding at the school site.

2.7 SUMMARY AND RECOMMENDATIONS

The results of the CDE pipeline protocol analysis indicate a total individual risk of 1.3 x 10^{-9}, which is much less than the CDE significance threshold of one in a million (1.0 x 10^{-6}). Therefore, the risk to staff or students at the proposed school site is not considered to be significant and no mitigation measures are required.

With recent changes to federal and state pipeline safety regulations (most recently, the Pipeline Safety Improvement Act of 2002, the PIPES Act of 2006, and the Pipeline Safety Act of 2011) and evolving industry standards, the risk of pipeline failures is expected to decrease in the future. The Office of Pipeline Safety (OPS) and the California Public Utilities Commission (CPUC) are charged with responsibility for pipeline safety and conduct regular inspections to ensure that the pipeline operators are complying with regulatory standards.

Even though the impact of pipeline releases was found to be less than significant, it is recommended that the school's emergency response and evacuation plan address the possibility of natural gas or water pipeline releases and identify potential evacuation routes. Also, contact names and numbers for the natural gas utility and water agencies (Pacific Gas & Electric, Menlo Park Municipal Water District, and California Water Services Company) should be maintained with the emergency response plan in case the school needs to report pipeline releases. A map of the pipeline locations and emergency contact information should be kept with the school's emergency response plan.

3. References

1. American Institute of Chemical Engineering (AIChE), 2000. Guidelines for Chemical Process Quantitative Risk Analysis, Second Edition, AIChE, New York, New York, 754 pp.
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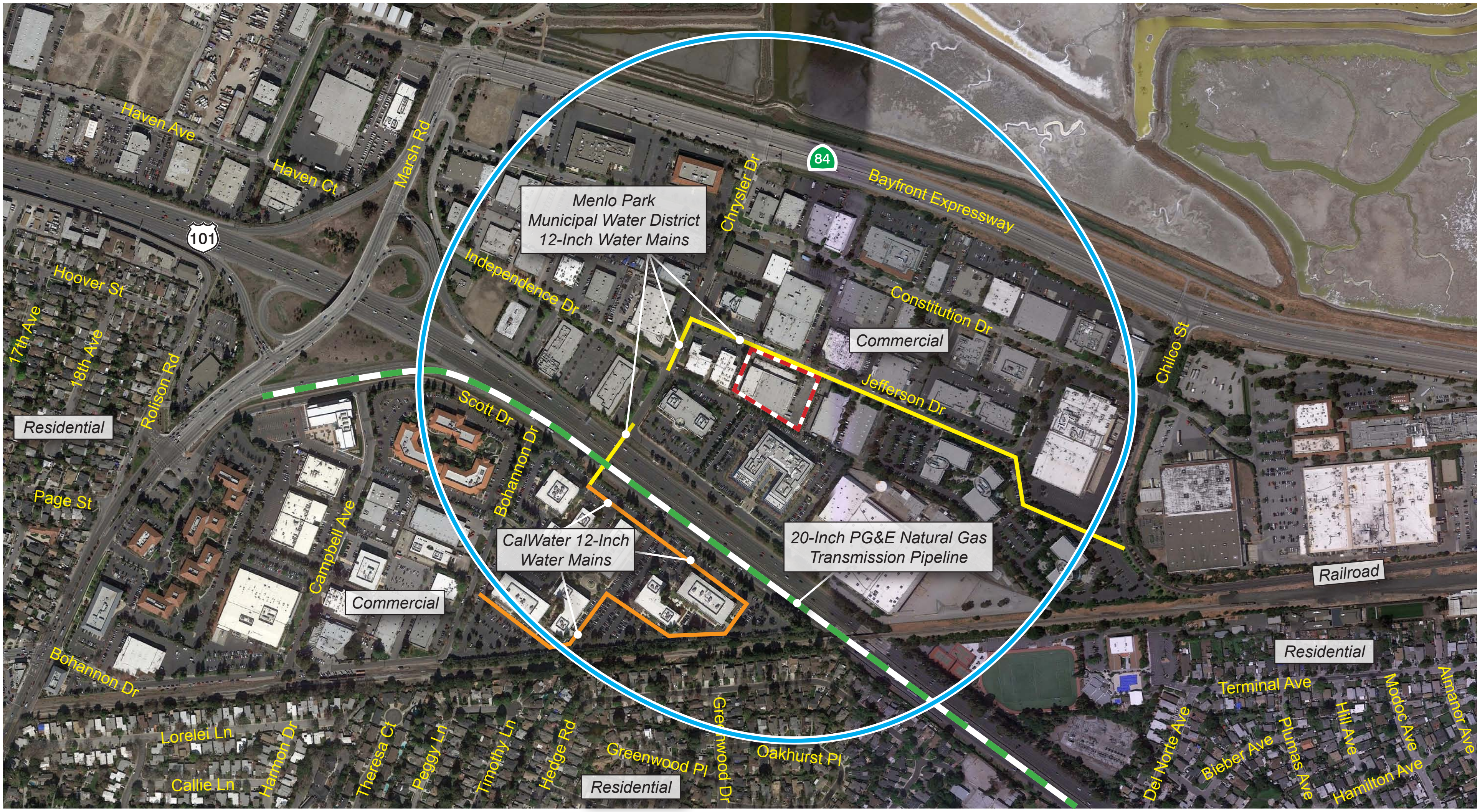
3. Bay Area Air Quality Management District (BAAQMD), 2005. Meteorological data for San Carlos meteorological station for year 2005. Accessed at http://hank.baaqmd.gov/tec/data/#.
4. California Department of Education (CDE), 2000. Resources for School Facilities Planning, School Selection and Approval Guide. Prepared by School Facilities Planning Division, CDE, Sacramento, CA.
5. CDE, 2007. Guidance Protocol for School Site Pipeline Risk Analysis, Prepared by URS Corporation. February, 2007.
6. California Water Service Company (CalWater), 2015. Email correspondence and map provided by Mr. William Torsch, Operations, CalWater to Mr. Steven Bush, Project Scientist, PlaceWorks. Dated January 13, 2016.
7. Franks, Donald L., 1990. User's Manual for SLAB: An Atmospheric Dispersion Model for Denser Than Air Releases. Physics Department, Atmospheric and Geophysical Sciences Division, University of California, Lawrence Livermore National Laboratory. Dated June 1990.
8. Jeffers & Associates, 2006. Modified Manning's Equation Solver. Version 3.0.
9. Menlo Park Municipal Water District, 2015. Email correspondence and maps provided by Mr. Whitney Loy, Engineering Technician II, Menlo Park Municipal Water District, to Mr. Steven Bush, Project Scientist, PlaceWorks, dated January 6, 2015.
10. National Pipeline Mapping System, 2015. Hazardous liquids pipeline map produced by the NPMS Public Viewer at www.npms.phmsa.dot.gov. Accessed on January 9, 2015.
11. Pacific Gas & Electric (PG&E) Company, 2014. Letter, map and email correspondence from Mr. Steven Liu, Gas Technical Specialist, PG&E to Mr. Kurt Soenen, Principal Engineer, Cornerstone Earth Group. Dated December 16, 2014.

Figures

Figure 1 - Site Location and Pipeline Map



Site Boundary
1,500-Ft Radius

Source: Google Earth Pro, 2014

Appendix A. CDE Risk Analysis Summary Forms and Calculations

Appendix

Local Educational Agency	
Date:	January 14, 2015
Local Educational Agency	Sequoia Union High School District
Contact	Dr. James Lianides
Telephone Number	650.369.1411
Street Address	480 James Avenue
City	Redwood City
County	San Mateo
Zip Code	94062
Proposed School Campus Site	
Name	Proposed New School Site
Location Description	150 Jefferson Drive, Menlo Park, California 94025
Pipelines of Interest	One natural gas transmission pipeline
Operator/Owner	Pacific Gas & Electric Company
Product Transported	Natural gas
Pipeline Diameter (inches)	20 inches
Operating Pressure (psig)	MAOP = 400 psig and normal operating pressure = 365 psig
Closest Approach to Property Line	700 feet

Individual Risk Estimate Result							
Type of Analysis (Check One)	Stage 1		Stage 2	X	Stage 3		
Individual Risk Estimate Value	1.3E-09						
Individual Risk Criterion	1.0E-06 (0.000001)						
IR Significance (check one)	Significant						
	Insignificant	X					

Certification and Signatures of Risk Analyst(s)

This analysis was conducted according to the 2007 CDE Protocol except as noted. All modifications within the Stage 2 framework, and Stage 3 analyses and exceptions to the data and processes established in the 2007 CDE Protocol, if any, were based upon my professional opinion and in a manner consistent with the standards of care and skill ordinarily exercised by professionals working on similar projects.

I certify that the estimated risk levels were derived based upon the 2007 CDE Protocol, unless otherwise noted, and that these levels demonstrate, with reasonable expectations of uncertainties for such estimates, that the estimated Individual Risk for the school site, as the site was planned at the time of this analysis, including mitigation measures, if any, meets the Individual Risk Criterion stated in the 2007 CDE Protocol, based on the information provided to me.

Printed Name	*Signature*	*Position or Title*
Dr. Cathleen M. Fitzgerald, P.E.		Senior Engineer

Notice: In the event that the Individual Risk Criterion could not be met, at the option of the LEA, CDE will still accept a report for review and consultation with the LEA.

20-INCH NATURAL GAS TRANSMISSION PIPELINE - Southwest Side of Highway 101

Input Data		
Product	natural gas	
Diameter	20	inches
Pressure	400	psig
R0	700	ft
	0	
XSEG	**RX(1%)**	**Units**
XSEG(LJF)	0	ft
XSEG(RJF)	0	ft
XSEG(LFF)	0	ft
XSEG(RFF)	1613	ft
XSEG(LEX)	0	ft
XSEG(REX)	0	ft

Base and Conditional Probability Calculations							
Base		**Leak**		**Rupture**		**Exposure**	
F0	1.2E-04	**PC(L)**	0.8	**PC(R)**	0.2	**PC(OCC)**	0.16
P0	1.2E-04	**PC(LIG)**	0.3	**PC(RIG)**	0.45	**PC(OUT)**	0.25
PAF	1.0	**PC(FIG)**	0.99	**PC(FIG)**	0.99		
PA	1.2E-04	**PC(JF)**	0.98	**PC(JF)**	0.98		
		PC(FF)	0.01	**PC(FF)**	0.01		
		PC(EIG)	0.01	**PC(EIG)**	0.01		
Calculated Values:							
PA(LJF)	0.0E+00	**PCI(LJF)**	0.233	**PCI(RJF)**	0.087		
PA(RJF)	0.0E+00	**PCI(LFF)**	0.002	**PCI(RFF)**	0.001		
PA(LFF)	0.0E+00	**PCI(LEX)**	0.002	**PCI(REX)**	0.001	**PC(EXPO)**	0.04
PA(RFF)	3.7E-05						
PA(LEX)	0.0E+00						
PA(REX)	0.0E+00						

Impact Probability Calculations							
Probability Term				**Values**			
PC(LJF) =	**PA(LJF) x**	**PCI(LJF) x**	**PC(EXPO) =**	0.0E+00	0.23	0.040	**0.0E+00**
PC(RJF) =	**PA(RJF) x**	**PCI(RJF) x**	**PC(EXPO) =**	0.0E+00	0.09	0.040	**0.0E+00**
PC(LFF) =	**PA(LFF) x**	**PCI(LFF) x**	**PC(EXPO) =**	0.0E+00	0.002	0.040	**0.0E+00**
PC(RFF) =	**PA(RFF) x**	**PCI(RFF) x**	**PC(EXPO) =**	3.7E-05	0.001	0.040	**1.3E-09**
PC(LEX) =	**PA(LEX) x**	**PCI(LEX) x**	**PC(EXPO) =**	0.0E+00	0.002	0.040	**0.0E+00**
PC(REX) =	**PA(REX) x**	**PCI(REX) x**	**PC(EXPO) =**	0.0E+00	0.001	0.040	**0.0E+00**

Based on data from impact distance figures in Section 4.6 and mortality figures in Section 4.5, enter the maximum impact probability at receptor location for each hazard in MAX PF(X) column.

IR Calculation				
	MAX PF(X)		**PC(X)**	**IR(X)**
IR(LJF) =	1.00		0.0E+00	**0.0E+00**
IR(RJF) =	1.00		0.0E+00	**0.00E+00**
IR(LFF) =	1.00		0.0E+00	**0.00E+00**
IR(RFF) =	1.00		1.3E-09	**1.31E-09**
IR(LEX) =	0.00		0.0E+00	**0.00E+00**
IR(REX) =	0.00		0.0E+00	**0.00E+00**
TOTAL INDIVIDUAL RISK, TIR				**1.3E-09**
CDE INDIVIDUAL RISK CRITERION, IRC				**1.0E-06**
TIR/IRC RATIO				**0.00**
PROTOCOL TIR INDICATOR RATIO				**0.82**

XSEG Calculations

Pipe Size, Pressure, and Hazard Type			Front Property Line - Begin Zone 1			Begin Zone 2			Begin Zone 3			End Zone 3 -Back Property Line		
Pipe Size	Press.	Hazard X	RX (1%)	R0	XSEG	RX (1%)	R0	XSEG	RX (1%)	R0	XSEG	RX (1%)	R0	XSEG
(in)	(psig)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
20	400	LJF	33	700	0	33	783	0	33	866	0	33	949	0
20	400	RJF	267	700	0	267	783	0	267	866	0	267	949	0
20	400	LFF	120	700	0	120	783	0	120	866	0	120	949	0
20	400	RFF	1,068	700	1613	1068	783	1453	1068	866	1250	1068	949	980
20	400	LEX	0	700	0	0	783	0	0	866	0	0	949	0
20	400	REX	0	700	0	0	783	0	0	866	0	0	949	0

TIR CALCULATIONS - END ZONE 1 - BEGIN ZONE 2

Green cells indicate data entry cells.

Input Data		
Product	natural gas	
Diameter	20	inches
Pressure	400	psig
R0	783	ft

XSEG	RX(1%)	Units
XSEG(LJF)	0	ft
XSEG(RJF)	0	ft
XSEG(LFF)	0	ft
XSEG(RFF)	1453	ft
XSEG(LEX)	0	ft
XSEG(REX)	0	ft

Base and Conditional Probability Calculations							
Base		Leak		Rupture		Exposure	
F0	1.2E-04	PC(L)	0.8	PC(R)	0.2	PC(OCC)	0.16
P0	1.2E-04	PC(LIG)	0.3	PC(RIG)	0.45	PC(OUT)	0.25
PAF	1.0	PC(FIG)	0.99	PC(FIG)	0.99		
PA	1.2E-04	PC(JF)	0.98	PC(JF)	0.98		
		PC(FF)	0.01	PC(FF)	0.01		
		PC(EIG)	0.01	PC(EIG)	0.01		
PA(LJF)	0.0E+00	PCI(LJF)	0.233	PCI(RJF)	0.087		
PA(RJF)	0.0E+00	PCI(LFF)	0.002	PCI(RFF)	0.001		
PA(LFF)	0.0E+00	PCI(LEX)	0.002	PCI(REX)	0.001	PC(EXPO)	0.04
PA(RFF)	3.3E-05						
PA(LEX)	0.0E+00						
PA(REX)	0.0E+00						

Impact Probability Calculations							
Probability Term				Values			
PC(LJF) =	PA(LJF) x	PCI(LJF) x	PC(EXPO) =	0.0E+00	0.23	0.040	**0.0E+00**
PC(RJF) =	PA(RJF) x	PCI(RJF) x	PC(EXPO) =	0.0E+00	0.09	0.040	**0.0E+00**
PC(LFF) =	PA(LFF) x	PCI(LFF) x	PC(EXPO) =	0.0E+00	0.002	0.040	**0.0E+00**
PC(RFF) =	PA(RFF) x	PCI(RFF) x	PC(EXPO) =	3.3E-05	0.001	0.040	**1.2E-09**
PC(LEX) =	PA(LEX) x	PCI(LEX) x	PC(EXPO) =	0.0E+00	0.002	0.040	**0.0E+00**
PC(REX) =	PA(REX) x	PCI(REX) x	PC(EXPO) =	0.0E+00	0.001	0.040	**0.0E+00**

Based on data from impact distance figures in Section 4.6 and mortality figures in Section 4.5, enter the maximum impact probability at receptor location for each hazard in MAX PF(X) column.

IR Calculation				
	MAX PF(X)		PC(X)	IR(X)
IR(LJF) =	1.00		0.0E+00	**0.0E+00**
IR(RJF) =	1.00		0.0E+00	**0.0E+00**
IR(LFF) =	1.00		0.0E+00	**0.0E+00**
IR(RFF) =	1.00		1.2E-09	**1.2E-09**
IR(LEX) =	0.00		0.0E+00	**0.0E+00**
IR(REX) =	0.00		0.0E+00	**0.0E+00**
TIR2 =				**1.2E-09**

TIR CALCULATIONS - END ZONE 2 - BEGIN ZONE 3

Green cells indicate data entry cells.

Input Data		
Product	natural gas	
Diameter	20	inches
Pressure	400	psig
R0	866	ft

XSEG	RX(1%)	Units
XSEG(LJF)	0	ft
XSEG(RJF)	0	ft
XSEG(LFF)	0	ft
XSEG(RFF)	1250	ft
XSEG(LEX)	0	ft
XSEG(REX)	0	ft

Base and Conditional Probability Calculations

Base		Leak		Rupture		Exposure	
F0	1.2E-04	**PC(L)**	0.8	**PC(R)**	0.2	**PC(OCC)**	0.16
P0	1.2E-04	**PC(LIG)**	0.3	**PC(RIG)**	0.45	**PC(OUT)**	0.25
PAF	1.0	**PC(FIG)**	0.99	**PC(FIG)**	0.99		
PA	1.2E-04	**PC(JF)**	0.98	**PC(JF)**	0.98		
		PC(FF)	0.01	**PC(FF)**	0.01		
		PC(EIG)	0.01	**PC(EIG)**	0.01		
PA(LJF)	0.0E+00	**PCI(LJF)**	0.233	**PCI(RJF)**	0.087		
PA(RJF)	0.0E+00	**PCI(LFF)**	0.002	**PCI(RFF)**	0.001		
PA(LFF)	0.0E+00	**PCI(LEX)**	0.002	**PCI(REX)**	0.001	**PC(EXPO)**	0.04
PA(RFF)	2.8E-05						
PA(LEX)	0.0E+00						
PA(REX)	0.0E+00						

Impact Probability Calculations

Probability Term				Values			
PC(LJF) =	**PA(LJF) x**	**PCI(LJF) x**	**PC(EXPO) =**	0.0E+00	0.23	0.040	**0.0E+00**
PC(RJF) =	**PA(RJF) x**	**PCI(RJF) x**	**PC(EXPO) =**	0.0E+00	0.09	0.040	**0.0E+00**
PC(LFF) =	**PA(LFF) x**	**PCI(LFF) x**	**PC(EXPO) =**	0.0E+00	0.002	0.040	**0.0E+00**
PC(RFF) =	**PA(RFF) x**	**PCI(RFF) x**	**PC(EXPO) =**	2.8E-05	0.001	0.040	**1.0E-09**
PC(LEX) =	**PA(LEX) x**	**PCI(LEX) x**	**PC(EXPO) =**	0.0E+00	0.002	0.040	**0.0E+00**
PC(REX) =	**PA(REX) x**	**PCI(REX) x**	**PC(EXPO) =**	0.0E+00	0.001	0.040	**0.0E+00**

Based on data from impact distance figures in Section 4.6 and mortality figures in Section 4.5, enter the maximum impact probability at receptor location for each hazard in MAX PF(X) column.

IR Calculation

	MAX PF(X)		PC(X)	IR(X)
IR(LJF) =	1.00		0.0E+00	**0.0E+00**
IR(RJF) =	1.00		0.0E+00	**0.0E+00**
IR(LFF) =	1.00		0.0E+00	**0.0E+00**
IR(RFF) =	1.00		1.0E-09	**1.0E-09**
IR(LEX) =	0.00		0.0E+00	**0.0E+00**
IR(REX) =	0.00		0.0E+00	**0.0E+00**
TIR3 =				**1.0E-09**

TIR CALCULATIONS - END ZONE 3 - BACK PROPERTY LINE

Green cells indicate data entry cells.

Input Data		
Product	natural gas	
Diameter	20	inches
Pressure	400	psig
R0	949	ft

XSEG	RX(1%)	Units
XSEG(LJF)	0	ft
XSEG(RJF)	0	ft
XSEG(LFF)	0	ft
XSEG(RFF)	980	ft
XSEG(LEX)	0	ft
XSEG(REX)	0	ft

Base and Conditional Probability Calculations

Base		Leak		Rupture		Exposure	
F0	1.2E-04	**PC(L)**	0.8	**PC(R)**	0.2	**PC(OCC)**	0.16
P0	1.2E-04	**PC(LIG)**	0.3	**PC(RIG)**	0.45	**PC(OUT)**	0.25
PAF	1.0	**PC(FIG)**	0.99	**PC(FIG)**	0.99		
PA	1.2E-04	**PC(JF)**	0.98	**PC(JF)**	0.98		
		PC(FF)	0.01	**PC(FF)**	0.01		
		PC(EIG)	0.01	**PC(EIG)**	0.01		
PA(LJF)	0.0E+00	**PCI(LJF)**	0.233	**PCI(RJF)**	0.087		
PA(RJF)	0.0E+00	**PCI(LFF)**	0.002	**PCI(RFF)**	0.001		
PA(LFF)	0.0E+00	**PCI(LEX)**	0.002	**PCI(REX)**	0.001	**PC(EXPO)**	0.04
PA(RFF)	2.2E-05						
PA(LEX)	0.0E+00						
PA(REX)	0.0E+00						

Impact Probability Calculations

Probability Term				Values			
PC(LJF) =	**PA(LJF) x**	**PCI(LJF) x**	**PC(EXPO) =**	0.0E+00	0.23	0.040	**0.0E+00**
PC(RJF) =	**PA(RJF) x**	**PCI(RJF) x**	**PC(EXPO) =**	0.0E+00	0.09	0.040	**0.0E+00**
PC(LFF) =	**PA(LFF) x**	**PCI(LFF) x**	**PC(EXPO) =**	0.0E+00	0.002	0.040	**0.0E+00**
PC(RFF) =	**PA(RFF) x**	**PCI(RFF) x**	**PC(EXPO) =**	2.2E-05	0.001	0.040	**7.9E-10**
PC(LEX) =	**PA(LEX) x**	**PCI(LEX) x**	**PC(EXPO) =**	0.0E+00	0.002	0.040	**0.0E+00**
PC(REX) =	**PA(REX) x**	**PCI(REX) x**	**PC(EXPO) =**	0.0E+00	0.001	0.040	**0.0E+00**

Based on data from impact distance figures in Section 4.6 and mortality figures in Section 4.5, enter the maximum impact probability at receptor location for each hazard in MAX PF(X) column.

IR Calculation

	MAX PF(X)		PC(X)	IR(X)
IR(LJF) =	1.00		0.0E+00	**0.0E+00**
IR(RJF) =	1.00		0.0E+00	**0.0E+00**
IR(LFF) =	0.00		0.0E+00	**0.0E+00**
IR(RFF) =	1.00		7.9E-10	**7.9E-10**
IR(LEX) =	0.00		0.0E+00	**0.0E+00**
IR(REX) =	0.00		0.0E+00	**0.0E+00**
TIR4 =				**7.9E-10**

Text Summary

20-Inch Natural Gas Transmission Pipeline Rupture - Jet Flame

ALOHA® 5.4.3

```
SITE DATA:
  Location: MENLO PARK, CALIFORNIA
  Building Air Exchanges Per Hour: 0.63 (unsheltered single storied)
  Time: January 10, 2015  1456 hours PST (using computer's clock)

CHEMICAL DATA:
  Chemical Name: METHANE                 Molecular Weight: 16.04 g/mol
  PAC-1: 2900 ppm    PAC-2: 2900 ppm     PAC-3: 17000 ppm
  LEL: 50000 ppm     UEL: 150000 ppm
  Ambient Boiling Point: -258.7° F
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 3 meters/second from N at 3 meters
  Ground Roughness: urban or forest      Cloud Cover: 5 tenths
  Air Temperature: 77° F                 Stability Class: D
  No Inversion Height                    Relative Humidity: 50%

SOURCE STRENGTH:
  Flammable gas is burning as it escapes from pipe
  Pipe Diameter: 20 inches               Pipe Length: 26400 feet
  Unbroken end of the pipe is connected to an infinite source
  Pipe Roughness: smooth                 Hole Area: 314 sq in
  Pipe Press: 415 psia                   Pipe Temperature: 77° F
  Max Flame Length: 55 yards
  Burn Duration: ALOHA limited the duration to 1 hour
  Max Burn Rate: 125,000 pounds/min
  Total Amount Burned: 792,433 pounds

THREAT ZONE:
  Threat Modeled: Thermal radiation from jet fire
  Red   : 89 yards --- (15.77 kW/(sq m))
```

20-Inch Natural Gas Transmission Pipeline Rupture - Flammable Vapor Cloud

Text Summary

ALOHA® 5.4.3

```
SITE DATA:
  Location: MENLO PARK, CALIFORNIA
  Building Air Exchanges Per Hour: 0.63 (unsheltered single storied)
  Time: January 10, 2015  1456 hours PST (using computer's clock)

CHEMICAL DATA:
  Chemical Name: METHANE                   Molecular Weight: 16.04 g/mol
  PAC-1: 2900 ppm    PAC-2: 2900 ppm     PAC-3: 17000 ppm
  LEL: 50000 ppm     UEL: 150000 ppm
  Ambient Boiling Point: -258.7° F
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 3 meters/second from N at 3 meters
  Ground Roughness: urban or forest      Cloud Cover: 5 tenths
  Air Temperature: 77° F                 Stability Class: D
  No Inversion Height                    Relative Humidity: 50%

SOURCE STRENGTH:
  Flammable gas escaping from pipe (not burning)
  Pipe Diameter: 20 inches               Pipe Length: 26400 feet
  Unbroken end of the pipe is connected to an infinite source
  Pipe Roughness: smooth                 Hole Area: 314 sq in
  Pipe Press: 415 psia                   Pipe Temperature: 77° F
  Release Duration: ALOHA limited the duration to 1 hour
  Max Average Sustained Release Rate: 23,100 pounds/min
     (averaged over a minute or more)
  Total Amount Released: 792,433 pounds

THREAT ZONE:
  Threat Modeled: Flammable Area of Vapor Cloud
  Model Run: Gaussian
  Red   : 356 yards --- (50000 ppm = LEL)
```

20-Inch Natural Gas Transmission Pipeline
Leak - Jet Flame

Text Summary ALOHA® 5.4.3

SITE DATA:
Location: MENLO PARK, CALIFORNIA
Building Air Exchanges Per Hour: 0.63 (unsheltered single storied)
Time: January 10, 2015 1456 hours PST (using computer's clock)

CHEMICAL DATA:
Chemical Name: METHANE Molecular Weight: 16.04 g/mol
PAC-1: 2900 ppm PAC-2: 2900 ppm PAC-3: 17000 ppm
LEL: 50000 ppm UEL: 150000 ppm
Ambient Boiling Point: -258.7° F
Vapor Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 3 meters/second from N at 3 meters
Ground Roughness: urban or forest Cloud Cover: 5 tenths
Air Temperature: 77° F Stability Class: D
No Inversion Height Relative Humidity: 50%

SOURCE STRENGTH:
Flammable gas is burning as it escapes from pipe
Pipe Diameter: 20 inches Pipe Length: 26400 feet
Unbroken end of the pipe is closed off
Pipe Roughness: smooth Hole Area: 0.785 sq in
Pipe Press: 415 psia Pipe Temperature: 77° F
Max Flame Length: 2 yards
Burn Duration: ALOHA limited the duration to 1 hour
Max Burn Rate: 313 pounds/min
Total Amount Burned: 16,303 pounds

THREAT ZONE:
Threat Modeled: Thermal radiation from jet fire
Red : less than 10 meters(10.9 yards) --- (15.77 kW/(sq m))

20-Inch Natural Gas Transmission Pipeline
Leak - Flammable Vapor Cloud

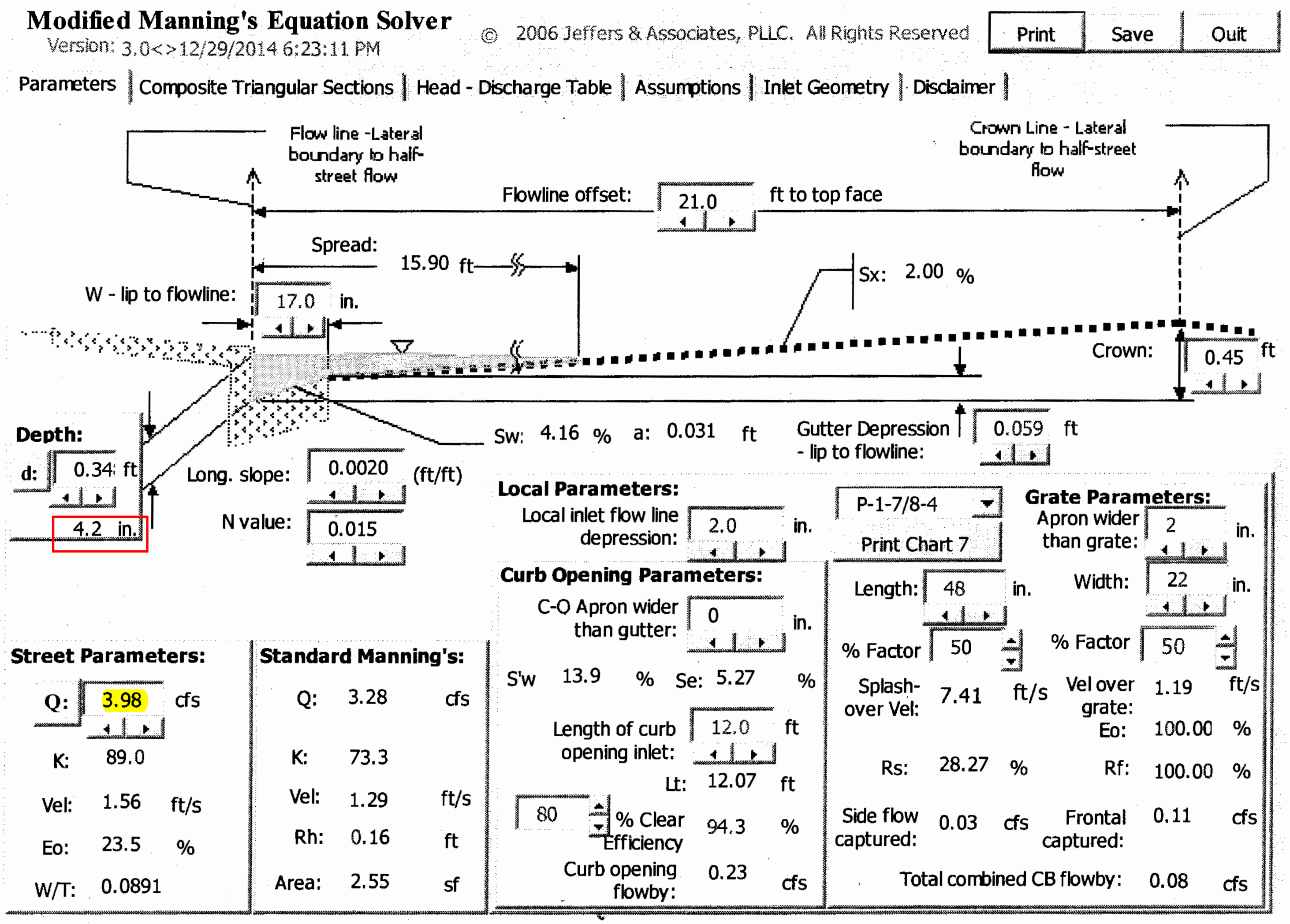

```
SITE DATA:
  Location: MENLO PARK, CALIFORNIA
  Building Air Exchanges Per Hour: 0.63 (unsheltered single storied)
  Time: January 10, 2015  1456 hours PST (using computer's clock)

CHEMICAL DATA:
  Chemical Name: METHANE                Molecular Weight: 16.04 g/mol
  PAC-1: 2900 ppm    PAC-2: 2900 ppm     PAC-3: 17000 ppm
  LEL: 50000 ppm     UEL: 150000 ppm
  Ambient Boiling Point: -258.7° F
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 3 meters/second from N at 3 meters
  Ground Roughness: urban or forest      Cloud Cover: 5 tenths
  Air Temperature: 77° F                 Stability Class: D
  No Inversion Height                    Relative Humidity: 50%

SOURCE STRENGTH:
  Flammable gas escaping from pipe (not burning)
  Pipe Diameter: 20 inches               Pipe Length: 26400 feet
  Unbroken end of the pipe is closed off
  Pipe Roughness: smooth                 Hole Area: 0.785 sq in
  Pipe Press: 415 psia                   Pipe Temperature: 77° F
  Release Duration: ALOHA limited the duration to 1 hour
  Max Average Sustained Release Rate: 305 pounds/min
     (averaged over a minute or more)
  Total Amount Released: 16,303 pounds

THREAT ZONE:
  Threat Modeled: Flammable Area of Vapor Cloud
  Model Run: Gaussian
  Red   : 40 yards --- (50000 ppm = LEL)
  Note: Threat zone was not drawn because effects of near-field patchiness
     make dispersion predictions less reliable for short distances.
```

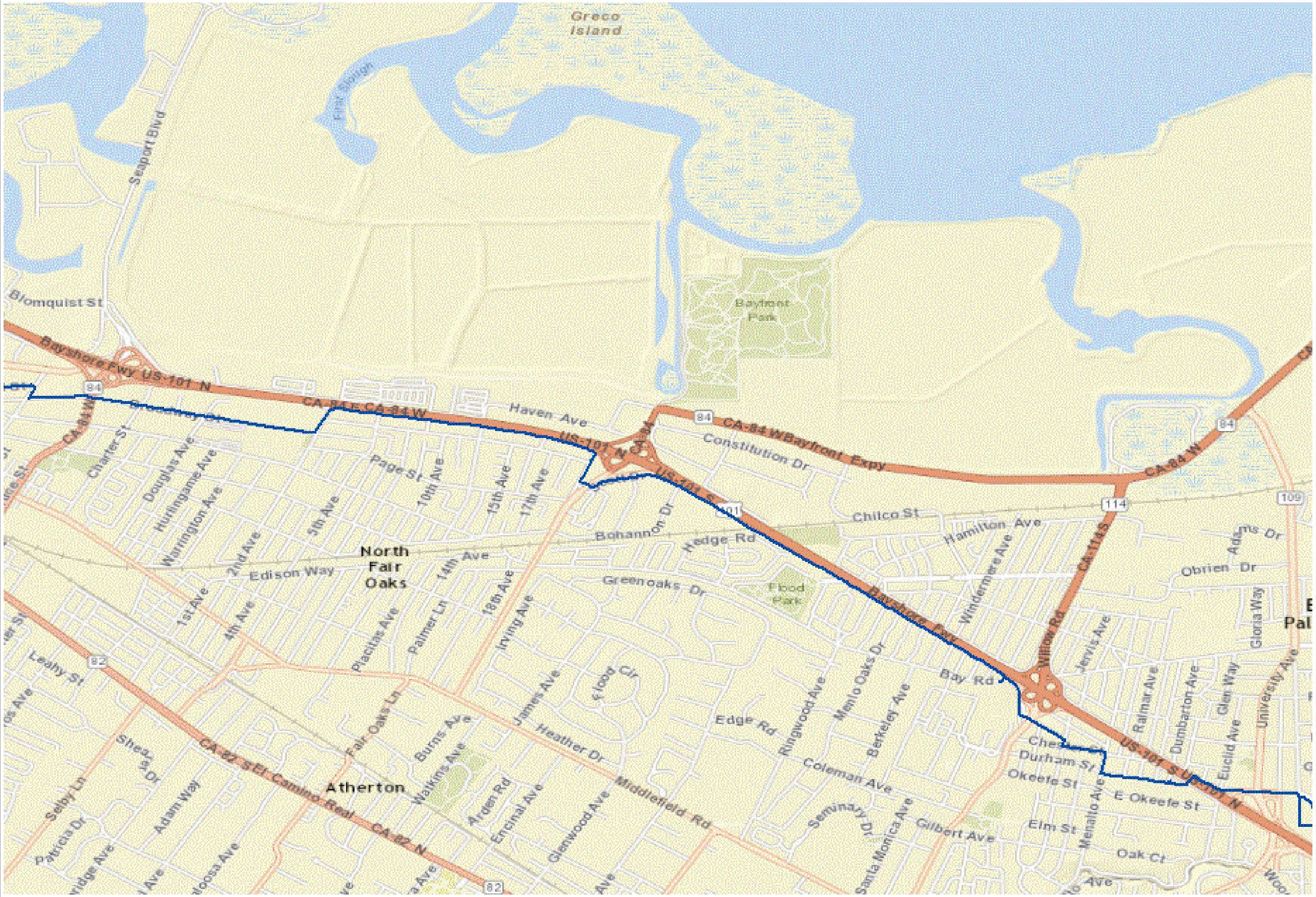


Street Flow Depth for Jefferson Drive

Appendix B. Agency Correspondence

Pipeline and Hazardous Materials Safety Administration

NATIONAL PIPELINE MAPPING SYSTEM



Legend

Gas Transmission Pipelines

Hazardous Liquid Pipelines

0 0.3 Miles

Pipelines depicted on this map represent gas transmission and hazardous liquid lines only. Gas gathering and gas distribution systems are not represented.

This map should never be used as a substitute for contacting a one-call center prior to excavation activities. Please call 811 before any digging occurs.

Questions regarding this map or its contents can be directed to npms-nr@mbakercorp.com.

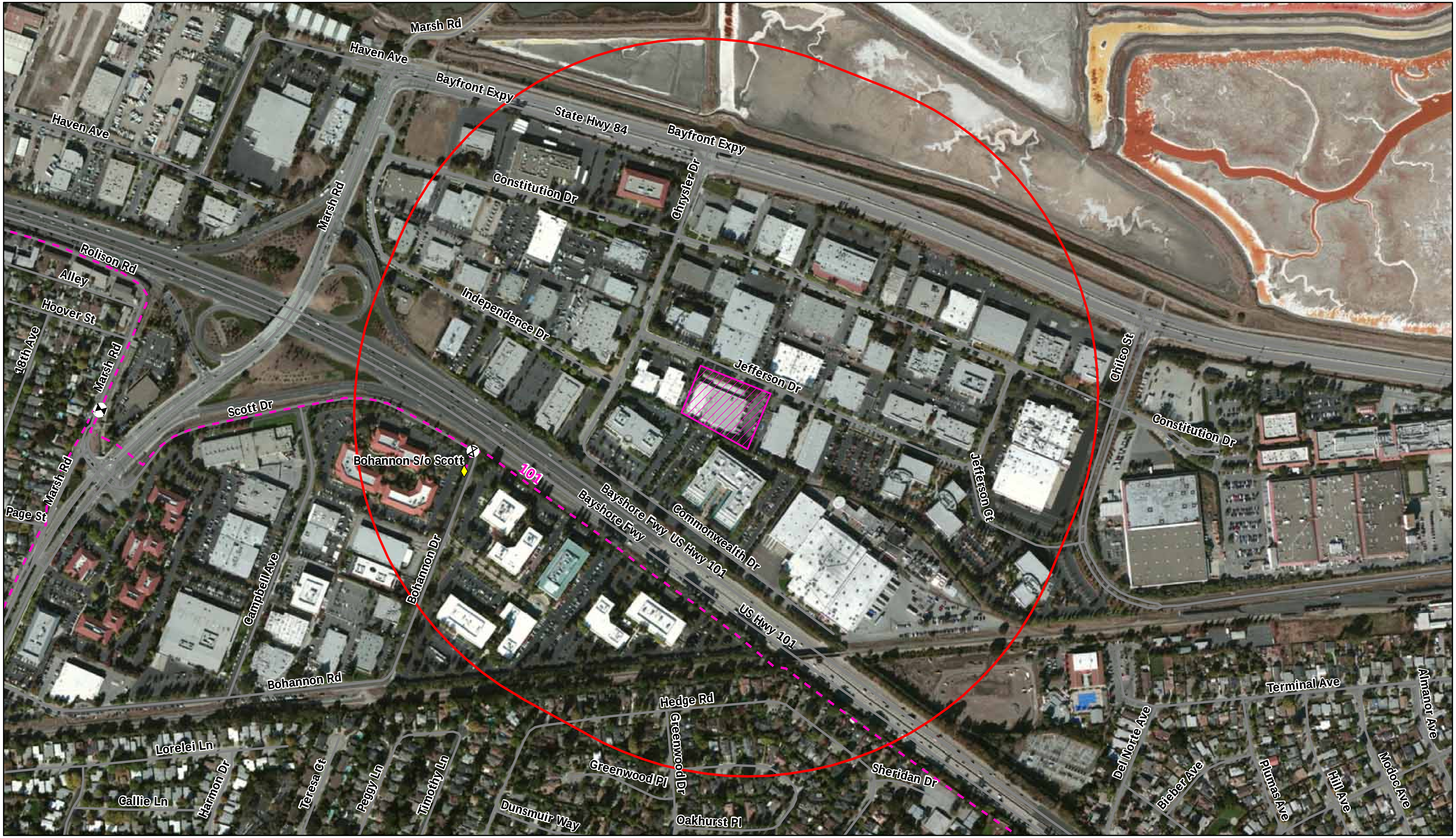
Projection: Geographic

Datum: NAD83

Map produced by the NPMS Public Viewer at www.npms.phmsa.dot.gov

Date Printed: Dec 23, 2014

811 Know what's below. Call before you dig.



01/08/2015
PG&E Critical Infrastructure Information
Must Be Held In Confidence
Facilities to be Operated by PG&E Personnel Only
Call 811 Before You Dig

School Site Buffer
School Site
Gas Station
Transmission Main

Menlo Park City School Site Map
150 Jefferson Dr, Menlo Park, CA 94025
Gas Engineering & Operations
Geographic Information Services

By: S3LG
1 inch = 400 feet
0 0.2 Miles

N

Questionnaire For Natural Gas Pipeline Risk Analysis Study

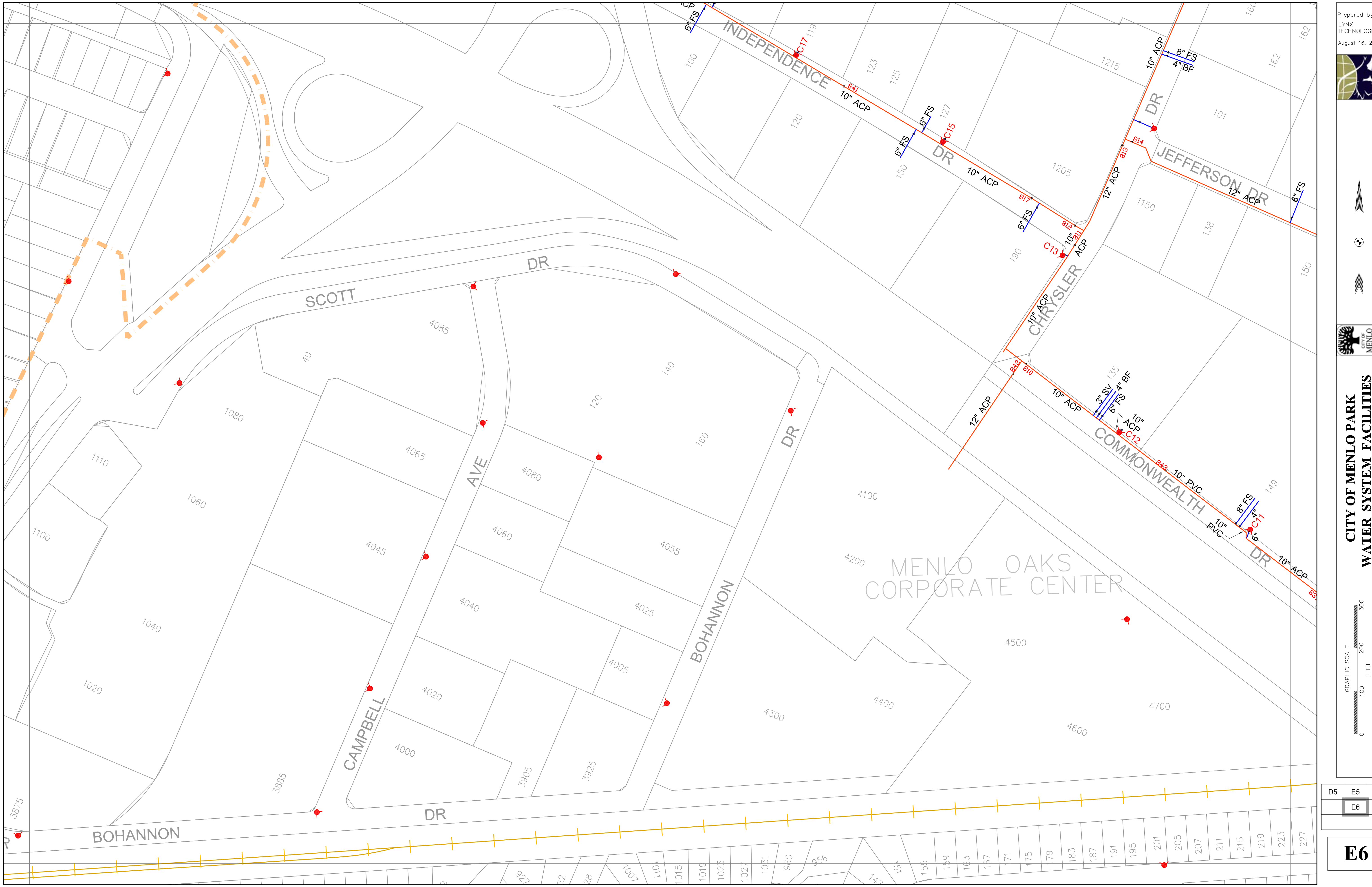
Subject Property:		150 Jefferson Drive, Menlo Park, CA 94025
1	Pipeline Reference (identification, line no., etc.):	101
	1a. Type: (Distribution, Gathering or Transmission):	Local Transmission
2	Date of Installation (Year):	1957
3	Maximum Allowable Operating Pressure (psig):	400
	3a. Normal Operation Pressure (MOP)	365
4	Diameter (inches):	20
5	Construction / Wall Thickness (steel, plastic/inches):	Steel / .3125
6	Corrosion Prevention (cathodic protection, tape, etc.):	Cathodic
7	% of Specified Minimum Yield Strength (MAOP):	30.48
8	Classification (Present) (1,2,3 or 4)	3
9	Inspection/Testing Results (method, date, etc.):	Per CPUC 112E
10	History of Incidents:	N/A
11	Pipeline Location Map within 1,500 feet of subject Property:	Attached

1	Pipeline Reference (identification, line no., etc.):	DREG4199
	1a. Type: (Distribution, Gathering or Transmission):	Service
2	Date of Installation (Year):	1988
3	Maximum Allowable Operating Pressure (psig):	400
	3a. Normal Operation Pressure (MOP)	365

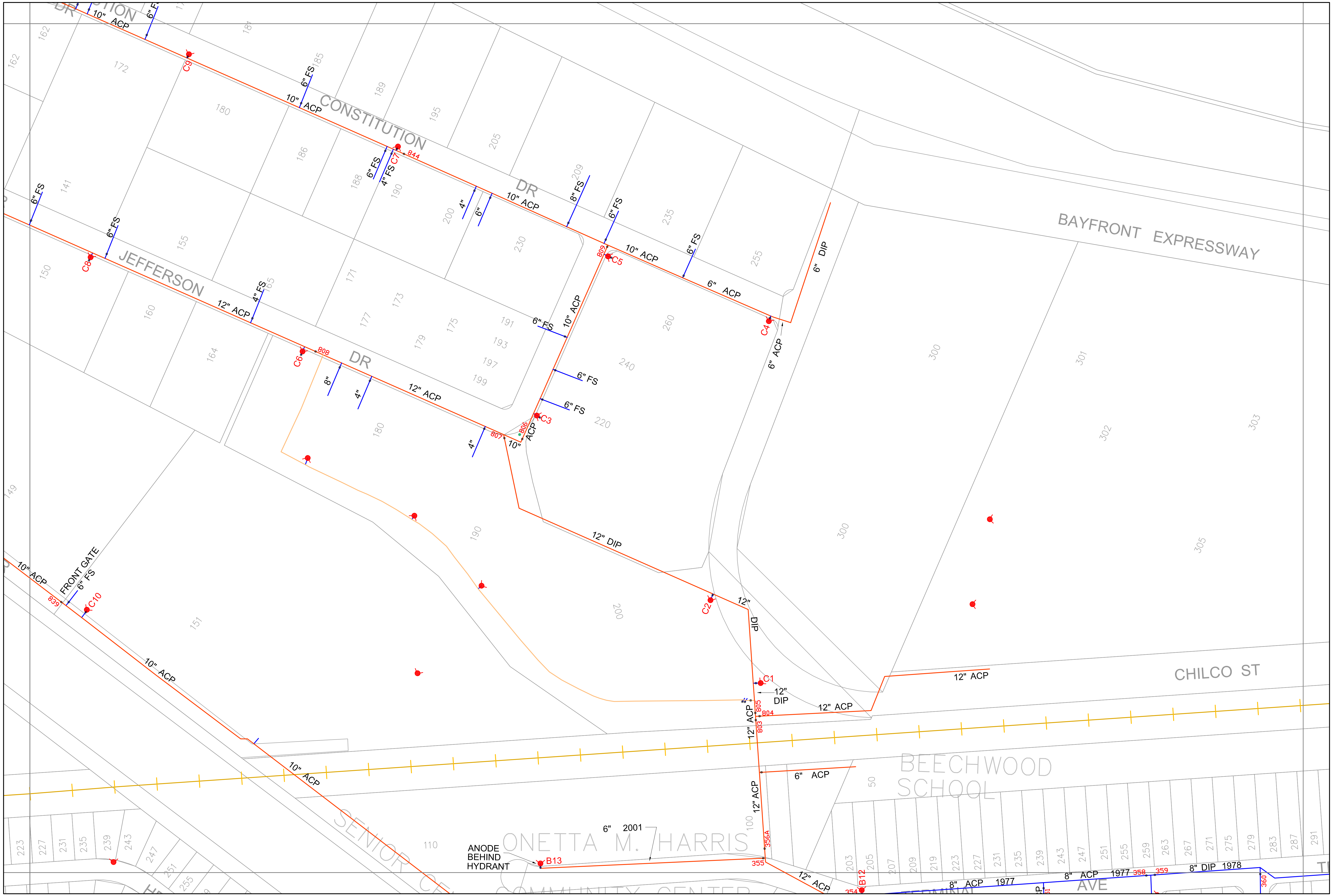
4	Diameter (inches):	3.5
5	Construction / Wall Thickness (steel, plastic/inches):	Steel / .141
6	Corrosion Prevention (cathodic protection, tape, etc.):	Cathodic
7	% of Specified Minimum Yield Strength (MAOP):	14.18
8	Classification (Present) (1,2,3 or 4)	3
9	Inspection/Testing Results (method, date, etc.):	Per CPUC 112E
10	History of Incidents:	N/A
11	Pipeline Location Map within 1,500 feet of subject Property:	Attached

QUESTIONNAIRE COMPLETED BY:

NAME:	Steven Liu	SIGNATURE:	s3lg@pge.com
TITLE	Gas Technical Specialist	DATE:	1/8/2015
COMPANY	PG&E		



THE CITY OF MENLO PARK ASSUMES NO LIABILITY FOR ERRORS OR OMISSIONS FOR UTILITY INFORMATION SHOWN ON THESE MAPS. ALL INFORMATION SHOULD BE FIELD VERIFIED.



Prepared by LYNX TECHNOLOGIES August 25, 2011

CITY OF MENLO PARK WATER SYSTEM FACILITIES

GRAPHIC SCALE 0 100 200 300 FEET

E5	F5	
E6	F6	G6
	F7	G7

F6

THE CITY OF MENLO PARK ASSUMES NO LIABILITY FOR ERRORS OR OMISSIONS FOR UTILITY INFORMATION SHOWN ON THESE MAPS. ALL INFORMATION SHOULD BE FIELD VERIFIED.

Cathy Fitzgerald

To: Steve Bush
Subject: RE: Pipeline Information/Map Request - 150 Jefferson Dr, Menlo Park, CA

From: Torsch, William [mailto:wtorsch@calwater.com]
Sent: Tuesday, January 13, 2015 2:08 PM
To: Steve Bush
Subject: RE: Pipeline Information/Map Request - 150 Jefferson Dr, Menlo Park, CA

From: Steve Bush [mailto:sbush@placeworks.com]
Sent: Thursday, January 08, 2015 1:09 PM
To: Torsch, William
Subject: Pipeline Information/Map Request - 150 Jefferson Dr, Menlo Park, CA

Good Afternoon,
Per our conversation today, here is the site map for the school siting project in Menlo Park. Additionally, here is some background on the project.

Cornerstone Earth Group is evaluating a property for a proposed school site. In compliance with CCR Title 5 Section 14010 (h), Cornerstone Earth Group has contracted the services of PlaceWorks to identify safety hazards related to any hazardous material pipelines or high volume water pipeline located within 1,500 feet of the schools' property lines. The project site is located at 150 Jefferson Drive in Menlo Park, California 94025, in San Mateo County. The attached site map illustrates an approximate 1,500-foot radius and area of concern of the project.

I'd like to identify whether the California Water Services owns or operates any water pipelines 12-inches in diameter or larger within 1,500 feet of the site. If any 12-inch or larger water lines are identified, I'd like to request a map of the line or area. The requested data will be used to assess consequence severity related to potential pipeline leaks or ruptures. Thank you for your assistance and please forward this information to my attention at the below address or via email, sbush@placeworks.com.

Regards,
STEVE BUSH, EIT
Project Scientist

PLACEWORKS

1625 Shattuck Avenue, Suite 300 | Berkeley, California 94709
510.848.3815 | sbush@placeworks.com | placeworks.com

The Planning Center|DC&E is now PlaceWorks. Please update your records.

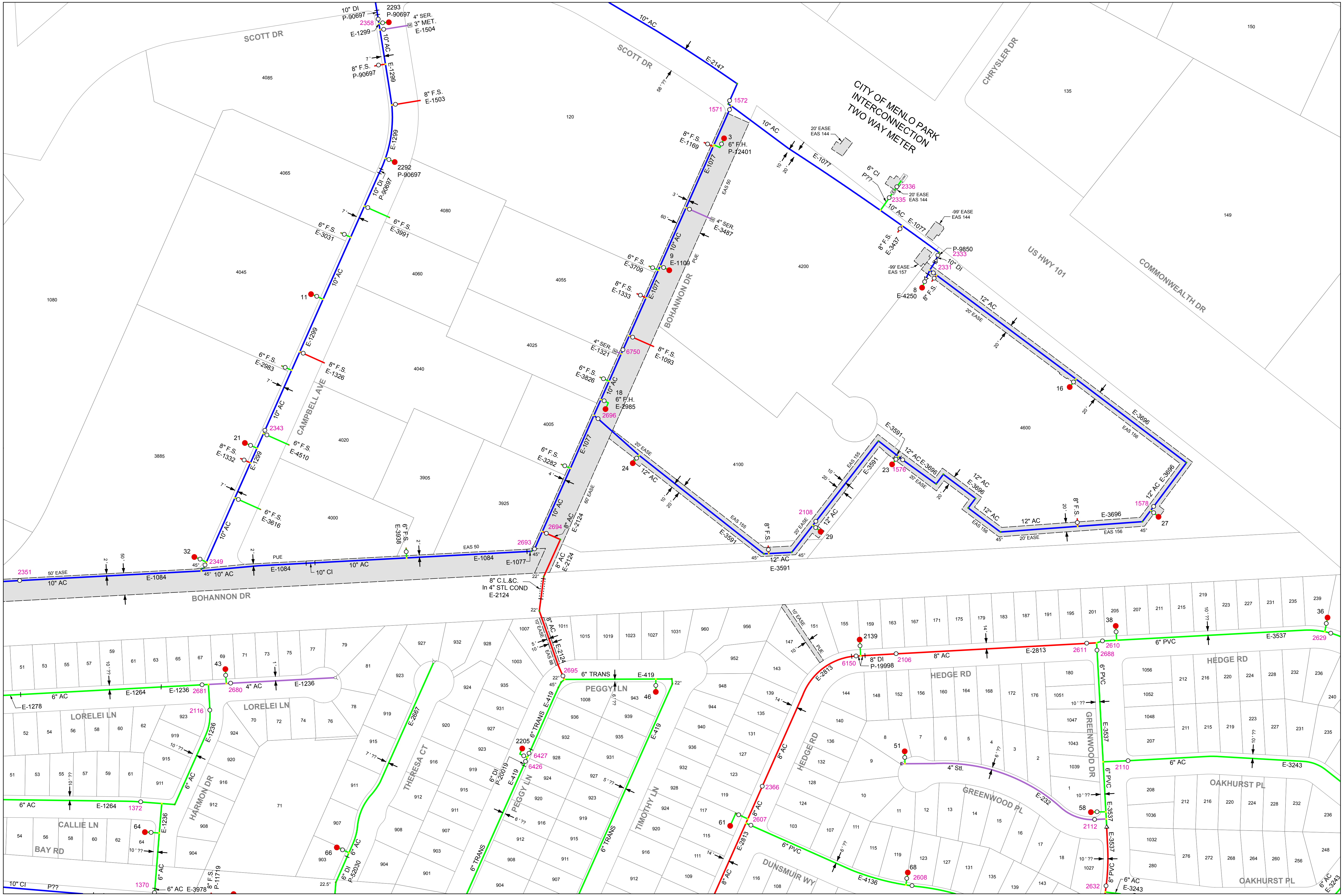
BG-21-32

ENGINEERING DEPARTMENT

GIS

BEAR GULCH DISTRICT
WATER SYSTEM

BG-22-31



BG-22-33

SCALE: 1" = 200'

Date of Issue: August 2013

Plat Sheet: BG-22-32

BG-23-32

APPENDIX H:

NOISE MONITORING DATA

Menlo Park Small High School
150 Jefferson Drive, Menlo Park
Appendix H: Noise Data Summary (not including 10-min interval data)
Prepared by MIG|TRA Environmenal Sciences, September 2015

Table H1: Summary of Site N1 Noise Monitoring Data

Date	*Time*	*Leq*	*Ldn*	*CNEL*	*Lmax*	*Lmin*	*L(10)*	*L(25)*	*L(50)*	*L(90)*
22Sep 15	11:00	56.5	56.5	56.5	73.8	49.1	58.7	53.9	51.5	49.8
22Sep 15	12:00	57.4	57.4	57.4	71.8	50.1	59.9	56.9	54.0	51.3
22Sep 15	13:00	57.1	57.1	57.1	71.3	50.7	59.4	56.0	53.9	51.8
22Sep 15	14:00	58.5	58.5	58.5	72.7	52.6	60.3	57.6	56.0	54.0
22Sep 15	15:00	58.1	58.1	58.1	68.4	53.0	60.9	58.1	56.4	54.3
22Sep 15	16:00	57.9	57.9	57.9	69.9	52.1	61.1	57.2	55.3	53.2
22Sep 15	17:00	60.2	60.2	60.2	73.6	51.0	64.2	60.3	55.6	52.1
22Sep 15	18:00	58.2	58.2	58.2	70.0	50.3	61.7	57.7	54.7	51.9
22Sep 15	19:00	54.3	54.3	59.3	65.4	49.7	56.1	54.1	52.9	51.0
22Sep 15	20:00	52.6	52.6	57.6	65.2	48.0	54.8	51.8	50.4	49.1
22Sep 15	21:00	50.5	50.5	55.5	64.6	46.9	51.7	49.7	48.7	47.5
22Sep 15	22:00	47.9	57.9	57.9	56.3	45.6	48.8	48.1	47.4	46.4
22Sep 15	23:00	47.6	57.6	57.6	59.0	45.0	48.4	47.4	46.8	45.6
23Sep 15	0:00	48.2	58.2	58.2	61.4	45.2	48.2	47.5	46.8	45.7
23Sep 15	1:00	48.4	58.4	58.4	59.0	44.8	48.9	47.6	46.8	45.6
23Sep 15	2:00	48.7	58.7	58.7	62.7	45.2	49.2	48.3	47.4	46.0
23Sep 15	3:00	48.9	58.9	58.9	58.3	46.1	50.1	49.3	48.4	46.9
23Sep 15	4:00	51.2	61.2	61.2	68.2	47.1	51.3	50.2	49.5	48.3
23Sep 15	5:00	55.1	65.1	65.1	67.3	51.5	57.0	54.3	53.5	52.3
23Sep 15	6:00	59.2	69.2	69.2	71.9	54.4	62.0	58.7	56.8	55.3
23Sep 15	7:00	58.0	58.0	58.0	73.1	52.2	60.3	56.6	54.6	53.1
23Sep 15	8:00	57.4	57.4	57.4	70.2	49.5	61.5	56.7	52.8	50.5
23Sep 15	9:00	57.8	57.8	57.8	73.0	49.6	61.4	56.2	52.5	50.5
23Sep 15	10:00	56.9	56.9	56.9	71.5	49.4	59.6	55.2	52.7	50.6
Site N1 Average:		**56.1**	**60.2**	**60.4**	**69.8**	**50.0**	**58.9**	**55.3**	**53.0**	**51.0**

Note: Hourly values based on 10-minute interval measurement periods.

Table H2: Summary of Site N2 Noise Monitoring Data

Date	*Time*	*Leq*	*Ldn*	*CNEL*	*Lmax*	*Lmin*	*L(10)*	*L(25)*	*L(50)*	*L(90)*
22Sep 15	13:00	57.4	57.4	57.4	68.2	55.2	58.6	57.8	57.2	56.2
22Sep 15	14:00	58.7	58.7	58.7	68.5	56.2	60.0	59.2	58.4	57.1
22Sep 15	15:00	59.6	59.6	59.6	66.8	57.2	60.6	59.9	59.4	58.4
22Sep 15	16:00	59.3	59.3	59.3	69.2	57.4	60.3	59.6	58.9	58.1
22Sep 15	17:00	58.2	58.2	58.2	65.6	56.3	59.1	58.6	58.0	57.1
22Sep 15	18:00	59.0	59.0	59.0	70.7	55.6	59.8	58.8	58.1	57.0
22Sep 15	19:00	57.8	57.8	62.8	66.5	55.5	58.9	58.0	57.4	56.3
22Sep 15	20:00	57.0	57.0	62.0	65.9	55.1	57.9	57.2	56.7	55.8
22Sep 15	21:00	56.5	56.5	61.5	63.6	54.2	57.5	56.8	56.3	55.3
22Sep 15	22:00	55.9	65.9	65.9	69.6	53.9	56.9	56.2	55.6	54.8
22Sep 15	23:00	55.2	65.2	65.2	63.6	53.6	56.0	55.5	54.9	54.1
23Sep 15	0:00	54.9	64.9	64.9	65.3	53.2	55.8	55.0	54.6	54.0
23Sep 15	1:00	54.9	64.9	64.9	64.5	53.1	55.8	55.0	54.6	53.9
23Sep 15	2:00	54.7	64.7	64.7	69.5	53.0	55.6	54.8	54.4	53.4
23Sep 15	3:00	55.0	65.0	65.0	66.1	53.3	56.0	55.2	54.6	53.8
23Sep 15	4:00	56.3	66.3	66.3	70.6	53.7	57.6	56.7	55.9	54.5
23Sep 15	5:00	57.5	67.5	67.5	67.1	55.0	58.8	57.9	57.2	56.0
23Sep 15	6:00	58.8	68.8	68.8	65.9	56.3	59.9	59.2	58.5	57.4
23Sep 15	7:00	64.9	64.9	64.9	90.8	54.8	59.9	58.2	57.4	55.8
23Sep 15	8:00	56.5	56.5	56.5	67.5	54.3	57.7	56.6	55.8	55.0
23Sep 15	9:00	64.0	64.0	64.0	95.7	54.2	60.7	57.1	56.0	55.1
23Sep 15	10:00	56.7	56.7	56.7	67.2	54.3	58.1	56.9	56.0	55.1
23Sep 15	11:00	58.8	58.8	58.8	74.2	52.1	64.1	57.2	55.7	53.5
23Sep 15	12:00	55.3	55.3	55.3	79.9	52.4	55.9	54.9	54.3	53.2
Site N2 Average:		**58.6**	**63.2**	**63.5**	**83.3**	**54.8**	**58.9**	**57.5**	**56.8**	**55.7**

Note: Hourly values based on 10-minute interval measurement periods.