APPENDIX C

Geologic Hazards Review

GEOLOGIC HAZARDS REVIEW JOHN ADAMS MIDDLE SCHOOL (JAMS) AUDITORIUM REPLACEMENT PROJECT 2425 16th STREET SANTA MONICA, CALIFORNIA

Prepared for:

SANTA MONICA – MALIBU UNIFIED SCHOOL DISTRICT FIP

2828 4th Street Santa Monica, California 90405-4308

Project No. 11428.006

June 20, 2017





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Attention: Ms. Sheere Bishop, Director of Procurement and Contract Management

Subject: Geological Hazards Review John Adams Middle School (JAMS) Auditorium Replacement Project 2425 16th Street Santa Monica, California

References: Appendix A

Leighton Consulting, Inc. (Leighton) is pleased to submit this geologic hazards review report in support of California Environmental Quality Act (CEQA) clearance and acceptability under California Department of Education (CDE) criteria for the proposed Auditorium Replacement Project at John Adams Middle School (JAMS). Our desktop study consisted of research, review of existing reports, limited near surface soil sampling and engineering analysis to support the CEQA and CDE environmental impact report preparation for the project.

This report presents our findings and conclusions based on the currently proposed development concept. It is our understanding that the proposed development will consist of a new Performing Arts Complex, approximately 30,000 to 35,000 building gross square feet (BGSF) in size and include a 750-seat auditorium, outdoor terrace, and dedicated classrooms, practice rooms, offices and libraries. The new facilities will occupy the entire site of the existing auditorium and Building J, and may also include a portion of the existing landscaped area to the west of the existing auditorium. The new auditorium and rehearsal space will be accessible to the public from the street as well

as from within the JAMS campus, and will also include a loading dock and truck parking area that is accessible from the public street. No plans showing the proposed conceptual site layout were available for review at this time. Once plans are developed additional investigation will be required to support design, permitting and construction.

We appreciate the opportunity to be of service to you on this project. If you have any questions or if we can be of further service, please contact us at **(866)** *LEIGHTON*; specifically at the phone extensions or e-mail as listed below.

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1.0 INTRODUCTION

1.1 <u>Site Description and Proposed Development</u>

The 11.1 acre John Adams Middle School (JAMS) campus, located at 2425 16th Street in the City of Santa Monica, is situated within a highly urbanized area within the Sunset Park neighborhood. The campus is rectangular in shape (plan view) and is bordered to the northwest by Pearl Street, to the southwest by 16th Street, to the northeast by 17th Street, and to the southeast by Ocean Park Boulevard. The existing auditorium, Building K (12,612 square feet) and Building J (5,616 square feet), understood to make up the area for the planned improvement project, are located in the northern portion of the campus immediately to the south of the intersection between Pearl Street and 17th Street. The existing ground surface (Psomas, 2006) in the northern portion of the campus in the vicinity of the planned improvements ranges from about Elevation (EI.) +140 to +145 feet mean sea level (msl). The JAMS campus and the site location for the planned improvements (latitude 34.01478°, longitude - 118.47003°) and immediate vicinity are shown on Figure 1, *Site Location Map*.

Based on review of historic aerial photographs (NETR, 2017), the original school classrooms were built in 1936 in accordance with the single-story Moderne design (PBS&J, 2010) as a direct response the Long Beach Earthquake and passage of the Field Act (1933). Additional classrooms were added in 1938, a shop and building auditorium were added in the 1940's and additional classrooms and remodeling of the front entryway (circa 1950's) have occurred over the decades.

It is our understanding that the proposed development will consist of a new Performing Arts Complex, approximately 30,000 to 35,000 building gross square feet (BGSF) in size, and include a 750-seat auditorium, outdoor terrace, and dedicated classrooms, practice rooms, offices and libraries. The new facilities will occupy the entire site of Building K (existing auditorium) and Building J including a portion of the landscaped area west of the existing auditorium, see Figure 2, *Boring Location Map* for approximate area of proposed modernization footprint. The new auditorium and rehearsal space will be accessible to the public from the street as well as from within the Campus, and will include a loading dock and truck parking area accessible from the public street. No plans showing the proposed conceptual site layout were available for review during preparation of this report.



1.2 Scope of Work

Leighton's scope of work included document review, geologic reconnaissance, limited soil sampling, geotechnical laboratory testing and engineering analyses to support the preparation of environmental documents. Documents reviewed in preparation of this report are included in Appendix A, *References*.

Our near surface soil sampling program consisted of excavating two (2) handauger borings to an approximate depth of 5 feet below existing ground surface (bgs) in the northern portion of the campus in the vicinity of exisitng Buildings J and K as shown on Figure 2, *Boring Location Map*. The borings were logged in the field by a certified engineering geologist from our staff. The soil encountered in each boring was reviewed and described in accordance with the Unified Soil Classification System (USCS). Bulk samples were obtained from the borings for geotechnical laboratory testing. After excavation, each boring was backfilled with nearby onsite soils. The boring logs are presented in Appendix B, *Boring Logs*

Laboratory tests were performed on representative bulk soil samples from the hand-auger borings (HA-1 and HA-2) to evaluate the expansion potential (ASTM D4829) and corrosivity (Soluble Sulfate ASTM C1580, Soluble Chloride ASTM C1411-09, pH ASTM D4972, and Resistivity ASTM G187-12a) of the onsite near-surface soils. The results of the laboratory tests are presented in Appendix C – *Laboratory Test Results*.

Our scope of work consisted of a geologic hazards evaluation in compliance with the California Geological Survey (CGS) Note 48 checklist for public schools and hospitals. The objective of our study was to assess soil and geologic conditions at and in the vicinity of the subject site based on existing information and recent information gathered. A completed *CEQA questionnaire for Section VI - Geology and Soils* has been included in Appendix D.

1.3 <u>Previous Investigations</u>

Converse Consultants performed a geotechnical field exploration program in 2008 for the proposed John Adams Middle School Replacement of classroom buildings E, F, & G, new Administration building modernization and site improvements Project (PBS&J, 2010). The investigation included a total of 16 hollow-stem auger borings drilled to depths between approximately 11.5 and 51.5 feet bgs throughout the campus, percolation testing, geotechnical laboratory



testing, engineering analysis and preparation of a report presenting conclusions and geotechnical recommendations for design and construction of the project (Converse Consultants, 2008).



2.0 GEOLOGIC SETTING AND SUBSURFACE CONDITIONS

2.1 <u>Geologic Setting</u>

The site is located in the Ocean Park Plain, a subdivision of the greater Santa Monica Plain, which is an alluvial surface within the southwestern block of the Los Angeles Basin (Poland and Piper, 1956). The Los Angeles Basin, a structural trough, is a northwest-trending alluviated lowland plain approximately 50 miles long and 20 miles wide. Mountains and hills that generally expose Late Cretaceous to Late Pleistocene-age sedimentary and igneous rocks bound the Basin along the north, northeast, east and southeast (Yerkes, 1965). The Basin is part of the Peninsular Ranges geomorphic province of California characterized by subparallel blocks sliced longitudinally by young, steeply dipping northwest-trending fault zones. The Basin, located at the northerly terminus of the Peninsular Ranges, is the site of active sedimentation and the strata are interpreted to be as much as 31,000 feet thick in the center of the synclinal trough of the Central Block of the Los Angeles Basin.

The Santa Monica and Ocean Park Plains consist of an alluvial aggradation of dissected sediments composed largely of gravel, sands and silts laid down by the ancestral Los Angeles River and by streams flowing south from the Santa Monica Mountains (Figure 3, *Regional Geology Map*). The Ocean Park Plain lies mostly in the southwest angle of Pico Boulevard and Bundy Drive, extends inland from the coast approximately 3 miles, is between 1 to 2 miles wide of which its surface is composed mostly of marine deposits of late-Pleistocene age (Poland and Piper, 1956).

2.2 Local Geologic Units and Subsurface Conditions

Presented below are summaries of the geologic units encountered in the nearsurface exploratory borings completed at the site by Leighton. Detailed descriptions of the geologic units encountered are presented on the boring logs in Appendix C, *Boring Logs*. Geotechnical conditions described on the logs represent the near-surface conditions at the actual exploratory excavation locations. Other variations may occur beyond and/or between the excavations. Lines of demarcation between the geologic units and the various earth materials on the logs represent approximated boundaries, and (unless otherwise noted) actual transitions may be gradual. The locations of the subsurface explorations are shown on Figure 2.



Campus site development masks over any surface exposures of natural geologic units and structure. Undocumented artificial fill (Afu) materials were encountered underlying existing landscape within our exploratory borings. Local geology was interpreted from published regional geologic maps of the area (Yerkes and Campbell, 2005; Dibblee, 1991). Figure 3 illustrates the approximate surficial distribution of geologic units at the site and surrounding areas. Native geologic units underlying the undocumented artificial fill materials consist of Quaternary age old paralic deposits (Qol), characterized as slightly to moderately consolidated silt, sand, and gravels.

2.2.1 Undocumented Artificial Fill: (Afu)

Artificial fill materials encountered in our explorations at the site (Borings HA-1 and HA-2) indicate fill depths ranging from approximately 3 to 3.5 feet bgs. The fill materials encountered generally consist of light yellow brown to dark brown silty sand with trace amounts of concrete and brick (man-made) debris. The undocumented artificial fill materials encountered at the site are likely associated with the existing improvements and initial development of the site. Localized thicker accumulations of fill materials should be anticipated during future earthwork construction. Fill materials encountered by others (Converse Consultants, 2008) throughout the JAMS campus ranged in thickness between approximately 2 to 7 feet bgs.

2.2.2 Quaternary Age Old Paralic Deposits: (Qol)

Quaternary age (Pleistocene) old paralic deposits generally consisting of reddish brown silty sand were encountered during the current investigation at the site beneath the artificial fill materials to the maximum explored depth of 5 feet bgs. The alluvial soils encountered by others (Converse Consultants, 2008) throughout the JAMS campus to the maximum depth explored of approximately 51.5 feet bgs generally consist of fine grained silty sand, sand with silt, and clayey sand. These sediments are reported to be medium dense within the upper 25 feet bgs and become indurated with depth (Converse Consultants, 2008).

2.3 Groundwater

Groundwater was not encountered in the shallow borings HA-1 and HA-2 augered at the site. In addition, groundwater was not encountered in any of the



16 borings drilled at the site by others up to a maximum depth of approximately 51.5 feet bgs (Converse Consultants, 2008). Review of groundwater level data reported through the State Water Resources Control Board website (<u>http://geotracker.waterboards.ca.gov/</u>), groundwater levels less than a mile to the southwest of the site generally ranges from 50 to 60 feet bgs.

Historic groundwater levels, as interpreted from the Beverly Hills 7.5 Minute Quadrangle, Los Angeles County, California (CGS, 1998) indicate historic high groundwater at levels greater than 40 feet below ground surface. Landscaping irrigation at the site, infiltration of stormwater runoff, fluctuations in rainfall, seasonal and/or otherwise may cause temporary perched water zones to exist below the site.

Groundwater is not expected to pose a constraint to construction of the project as currently planned. Because the anticipated depths of excavation for the project are less than the historic high groundwater levels, the potential impact of encountering groundwater during construction is considered less than significant. Detailed geotechnical design investigations conducted in support of future planned concept(s) will be tailored to identify depth to groundwater at the time of the investigation.



3.0 GEOLOGIC AND SEISMIC HAZARDS

3.1 Faulting

There are no active or potentially active faults known to cross the project site and the site is not located within an Alquist-Priolo Earthquake Fault Zone (CGS, 1986; Bryant and Hart, 2007) and as such, the potential for surface fault rupture at the site is considered low. However, several active and potentially active faults are mapped within 10 km (6.2 miles) of the site. Figure 4, *Regional Fault Map*, shows the proximity of known active and potentially active faults within the region. Considering the locations of these mapped faults relative to the site, the potential impact of surface fault rupture occurrence at the site is considered to be low. Therefore, the impact of fault rupture is less than significant.

Santa Monica Fault: Although not yet recognized or well-defined by the State of California as a Special Studies Zone, the SMFZ is the closest known fault to the site, at a distance of approximately 1.3 miles (2.1 km) north of the site. The SMFZ is considered active, but <u>not</u> proven to be active, and mapped as being located primarily along Santa Monica Boulevard. This fault zone generally trends east-west along the southern boundary of the Santa Monica Mountains for more than 24 miles and is included as part of the Transverse Ranges Southern Boundary fault system, which consists of east-west trending, left-lateral and oblique-reverse movements along several active faults. The SMFZ consists of east-southeast trending reverse, left-lateral oblique-slip structures that extend more than 200 km (125 miles) across southern California and accommodate westward motion of the Transverse Ranges (Dolan *et al.*, 1997). It has been delineated locally at depths of several-thousand feet through exploratory oil well drilling and oil field development (Wills et al., 2008).

High resolution seismic reflection profiles across the SMFZ were acquired (Pratt, *et al.*, 1998) as part of an integrated hazard assessment of this fault, which showed a series of near vertical strike-slip faults beneath topographic scarps inferred to be caused by thrust faulting. Pleistocene or Holocene movement had been postulated, but <u>not</u> directly proven along some upper plate secondary fault segments related to the SMFZ (Dolan *et al.*, 2000). Recurrence interval and recency of movement along many fault segments are neither well documented nor understood, mainly because intense urbanization has modified or destroyed any surface traces of the fault (Hill et al., 1979). Southern California Earthquake



Center (SCEC) identifies the most recent rupture as Late Quaternary with intervals between events unknown.

North-dip, west-slip rate across the SMFZ is estimated to vary with location along en-echelon faults to be minimally on the order of 0.6 mm/year (Dolan et. al., 2000) and as high as 3.9 to 5.9 mm/year (Davis and Namson, 1994). A deterministic estimated maximum magnitude earthquake is generally modeled between Magnitude (M_w) 6.0 and 7.0 if the entire SMFZ ruptured at once.

The City of Santa Monica Geologic Hazards map (City of Santa Monica, 2014) indicates two branches of the Santa Monica Fault zone are located within a "Fault Hazard Management Zone" (FHMZ) that is approximately 1 mile to the north of the project site. Sites located within the FHMZ require fault studies be conducted prior to approval of building permits.

Newport Inglewood Fault: The Newport-Inglewood fault, located approximately 5 miles (8 km) east of the project site is an active, zoned, northwest-trending, approximately 2- to 4-mile-wide belt of anticlinal folds and faults disrupting early Holocene to Late Pleistocene-age and older deposits (Barrows, 1974). The NIFZ is characterized by trends related to right-lateral shearing at depth (Moody and Hill, 1956). The zone defines the boundary between the western basement complex of Catalina type schist and related rocks to the southwest, and the eastern basement complex of metasedimentary, metavolcanic and plutonic rocks to the northeast (Yerkes, et al., 1965). Right-lateral, strike-slip displacement of 3,000 to 5,000 feet has been measured in Lower Pliocene strata along the NIFZ (Hill, 1954; Poland and Piper, 1956). Apparent vertical offset across faults of the NIFZ ranges from 4,000 feet at the basement interface, to 1,000 feet in the Pliocene strata, and 200 feet at the Plio-Pleistocene boundary (Yerkes, et al., 1965). Movement along this structural zone is inferred to have been initiated during middle Miocene time (circa 15 million years ago), with seismic activity continuing to the present time. There is abundant seismic evidence that the zone is tectonically active; thus, the surrounding metropolitan area is subject to certain seismic risks. At least five earthquakes of magnitude 4.9 or larger have been associated with the NIFZ since 1920 (Barrows, 1974). Estimated maximum deterministic magnitude earthquake is generally modeled between Magnitude (Mw) 6.5 and 7.2.

Palos Verdes Fault: The Palos Verdes fault is considered active and is located approximately 5.8 miles (9.3 km) southwest of the project site forming the western boundary of the Los Angeles basin. The Palos Verdes fault is made up



of a system of three segments which collectively form a complex right-lateral reverse displacement (Brankman and Shaw, 2009). The modeled right-lateral slip rate along the zone is between 2.5 and 3.8 mm/yr, and reverse slip rate is between 0.26 and 0.38 mm/yr (Cooke and Marshall, 2006). Calculated slip rates within the northern portion of the Palos Verdes fault zone are estimated to be 0.35 mm/yr reverse slip rate and 1.1 mm/yr right-lateral slip rate (Shaw, 2007). Estimated maximum moment magnitude along this fault complex is on the order of 7.3.

Hollywood Fault: Located approximately 6 miles (9.6 km) northeast of the site, the Hollywood Fault begins near the Los Angeles River and eastern edge of the Santa Monica Mountains and extends westward for approximately $9\frac{1}{2}$ miles where it is thought to shift its locus of active deformation to the area of the West Beverly Hills Lineament (WBHL), where faulting takes a left step to the Santa Monica Fault. The Hollywood Fault is capable of producing a M_w 6.4 to 6.6 earthquake (Dolan et al., 1997). Investigators have estimated the lateral slip rate to be about 1.0 ±0.5 mm/year, with a vertical slip rate to be 0.25 mm/year (Dolan et al., 1997). Conversely, a lower slip rate of 0.04 to 0.4 mm/year (Ziony, 1985) leads to a long return period.

Recent detailed geologic and geotechnical studies have provided cumulative physical evidence for Holocene displacements resulting in an Alquist-Priolo Special Study Zone being established for the Hollywood Fault (CGS, 2014). Exposures identified in prior explorations (Crook and Proctor, 1992), coupled with bulk-soil radiocarbon ages provide scant evidence for an early to mid-Holocene age for the most recent surface rupture approximately 6,000 years to 11,000 years ago; suggesting a long period of quiescence between surface rupturing on the Hollywood Fault (Dolan, 1997, 2000; Ziony, 1985).

3.2 <u>Historical Seismicity</u>

An evaluation of historical seismicity from significant past earthquakes related to the site was performed (see Figure 5, *Historic Seismicity Map*). Peak ground accelerations (PGA) at the site resulting from significant past earthquakes between 1800 to 2016, with magnitudes M4.0 or greater, were estimated using the EQSEARCH computer program (Blake, 2000) with 2016 updates. This historical seismicity search was performed for a 100-kilometer (62-mile) radius from the project site. The largest earthquake magnitudes found in the search were four M7.0 earthquakes, the closest of these to the site was the one that



occurred on September 24, 1827 approximately 30.3 miles (48.8 kilometers) from the site producing an estimated site acceleration of approximately 0.138g. The largest estimated PGA found in the search was approximately 0.234g from an earthquake approximately 2.0 miles (3.2 kilometers) from the site.

Review of additional data publically available from the Center for Engineering Strong Motion Data (CESMD) website (<u>http://strongmotioncenter.org/</u>) was reviewed for stations in the vicinity of the project site. The data reviewed indicates that a site (Santa Monica City Hall) approximately 1.2 miles to the southwest of the project site experienced a peak ground acceleration of 0.901g from the M6.7 Northridge earthquake that occurred on January 17, 1994. This earthquake occurred less than 15 miles (24.1 km) north of the project site along a blind thrust fault damaging structures throughout Los Angeles, Ventura, Orange, and San Bernardino Counties.

3.3 Seismic Shaking

The site may experience strong ground shaking after the proposed project is developed resulting from an earthquake occurring along one or more of the major active or potentially active faults identified above. Accordingly, the project should be designed in accordance with all applicable current codes (California Building Code, current edition) and standards utilizing the appropriate seismic design parameters presented in Section 3.3.1 of this report to reduce seismic risk as defined by California Geological Survey (CGS) Chapter 2 of Special Publication 117a (CGS, 2008). Through compliance with these regulatory requirements and the utilization of appropriate seismic design parameters from the current building code (CBC, 2016), selected by the design professionals, potential impacts relating to seismic shaking would be reduced to less than significant.

3.3.1 Seismic Design Parameters

Moderate to strong ground shaking due to seismic activity is expected at the site during the life span of the project. The following are the current code-based (2016 California Building Code, Section 1613A.3) seismic design ground motion parameters for new Type III Public School Buildings.



Categorization/Coefficients	ASCE 7-10 Code- Based ^{(1) (2)}
Site Longitude (decimal degrees) West	-118.47003
Site Latitude (decimal degrees) North	34.01478
Site Class	D
Mapped Spectral Response Acceleration at 0.2s Period, S_{s}	1.985
Mapped Spectral Response Acceleration at 1s Period, S_1	0.734
Short Period Site Coefficient at 0.2s Period, F_a	1.0
Long Period Site Coefficient at 1s Period, F_v	1.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS}	1.985
Adjusted Spectral Response Acceleration at 1s Period, S_{M1}	1.102
Design Spectral Response Acceleration at 0.2s Period, S_{DS}	1.323
Design Spectral Response Acceleration at 1s Period, S_{D1}	0.734

1. All were derived from the USGS web page: <u>http://earthquake.usgs.gov/designmaps/us/application.php</u>

2. All coefficients in units of g (spectral acceleration)

3.4 Liquefaction and Lateral Spreading

Liquefaction is the loss of soil strength or stiffness due to a buildup of pore-water pressure during severe ground shaking. Liquefaction is associated primarily with loose (low density), saturated, fine- to medium-grained, cohesionless soils. Effects of severe liquefaction can include sand boils, excessive settlement, bearing capacity failures, and lateral spreading.

Review of both the Beverly Hills Quadrangle Seismic Hazard Zone Map (CGS, 1999) and the City of Santa Monica Geologic Hazards map (City of Santa Monica, 2014) indicates that the site is <u>not</u> within an area potentially susceptible to liquefaction (Figure 6, *Seismic Hazard Map*). In addition, the historic high groundwater level at the site is greater than 40 feet bgs (CGS, 1998) and groundwater was not encountered in any of the 16 borings drilled at the site by others up to a maximum depth of approximately 51.5 feet bgs (Converse Consultants, 2008). The site is geologically mapped in an area that is considered to have a low susceptibility for liquefaction (Pleistocene age older paralic deposits). Based on these findings, the potential for liquefaction at the site is considered low.



Since the potential for liquefaction is considered low and the relatively flat nature of the site with no free faces, the potential for lateral spreading to occur at the site is considered low.

3.5 <u>Seismically-Induced Settlement</u>

Seismically-induced settlement consists of dry dynamic settlement (above groundwater) and liquefaction-induced settlement (below groundwater). These settlements occur primarily within loose to moderately dense sandy soil due to reduction in volume during and shortly after an earthquake event.

Based on analysis performed by others for the subsurface soil profile as encountered in the hollow-stem auger borings drilled at the JAMS campus (Converse Consultants, 2008), the total seismically-induced settlement was estimated to be less than 0.04-inch. Accordingly, seismically-induced differential settlement was estimated to be less than 0.02-inch over 40 feet.

Following implementation of remedial earthwork at the site and in consideration of the project's conformance with standard structural design requirements (CBC, 2016), potential impacts relating to seismically induced settlement can be reduced to less than significant.

3.6 <u>Seismically-Induced Landslides</u>

The proposed project site is <u>not</u> located in an area mapped as potentially susceptible to seismically-induced landslides (Figure 6, *Seismic Hazard Map*). No landslides are mapped or known to exist at the project site or vicinity. The topography of the site is relatively flat, and gently slopes to the southwest. Therefore, the potential for seismically induced landslides to affect the site is low.

3.7 <u>Flooding</u>

As shown on Figure 7, *Flood Hazard Zone Map*, the site is <u>not</u> located within an area recognized by the Federal Emergency Management Agency (FEMA) to have a 1% annual chance of flood (100-year flood) or a 0.2% annual chance of flood (500-year flood) (FEMA, 2008). Earthquake-induced flooding can be caused by failure of dams or other water-retaining structures as a result of an earthquake. As shown on Figure 8, *Dam inundation Map*, the site is <u>not</u> located within a dam inundation area. Due to the absence of such structures near the site the potential for earthquake-induced flooding at the site is considered low.



3.8 <u>Seiches and Tsunamis</u>

Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Tsunamis are sea waves generated by large-scale disturbance of the ocean floor that induces a rapid displacement of the water column above. The most frequent causes of tsunamis are shallow underwater earthquakes and submarine landslides.

The site is <u>not</u> located within the tsunami inundation area as mapped by the State of California (CGS, 2009). Therefore, based on the site's elevation of approximately 140-145 feet above sea level (Psomas, 2006) and the lack of nearby enclosed water bodies, the risks associated with tsunamis and seiches are considered negligible.

3.9 Slope Stability and Landslides

The site is <u>not</u> located within any landslide hazard area as mapped by the City of Santa Monica General Plan's Safety Element (City of Santa Monica, 2014). Since the developed site generally is relatively flat, the potential for slope instability and landslides is not considered a geotechnical hazard for the site.

3.10 Soil Corrosion Potential

Based on the results of the recent corrosion testing performed on two representative bulk samples from the upper 5 feet at the site (see Appendix C, *Geotechnical Laboratory Test Results*), the site soils are deemed moderately corrosive to ferrous metals based on minimum soil resistivity (saturated) values between 7365 and 9290 ohm-cm. Sulfate attack potential for concrete in contact with site soils is deemed negligible based on sulfate content between 54 and 137 parts per million (ppm). Chloride exposure is deemed low based on a chloride content of 30 ppm.

General recommendations for ferrous corrosion protection include use of nonferrous pipe or protective measures to separate ferrous pipes from on-site soils. Through implementation of these recommendations, potential impacts relating to corrosive soils would be less than significant. A competent corrosion engineer should be retained to evaluate the specific corrosion potential of the site's soils, to perform further testing as may be required, and to provide specific required protective measures to mitigate corrosion risk, as may be necessary.



3.11 Soil Expansion Potential

Expansive shall be determined in accordance with the *California Building Code* 2016 Chapter 1803A.5.3 Expansive Soil. Expansive soils (EI>20 per ASTM D 422) contain significant amounts of clay particles that swell considerably when wetted and shrink with the loss of water. Foundations and structures constructed on these soils can be subjected to uplifting forces caused by the swelling, potentially resulting in heaving and cracking of both building foundations and slabs-on-grade.

Expansion Index (EI) testing of two representative bulk samples from the upper 5 feet at the site indicated that the site soils have EI values ranging from 2 to 3 (see Appendix C, *Geotechnical Laboratory Test Results*). These test results indicate a very low expansion potential for onsite materials and are generally consistent with the previous investigation performed at the project site by others (Converse Consultants, 2008). Implementation of standard engineering and earthwork construction practices, such as proper foundation design and proper moisture conditioning of earthen fills will reduce the impacts associated with expansive soils to tolerable levels. Additional testing of soils upon completion of grading or during future geotechnical studies should be performed to confirm the results of the initial testing.

3.12 Excavation Characteristics

Based on our shallow subsurface explorations (Borings HA-1 and HA-2), review of prior work (Converse Consultants, 2008) and experience from grading jobs in the vicinity of the site, we anticipate that soils at the site will be readily rippable. Based on our field observations, caving of cohesionless strata and loose fill soil may be encountered in unshored excavations. To protect workers entering excavations, excavations should be performed in accordance with OSHA and Cal-OSHA requirements, and the current edition of the California Construction Safety Orders, see: <u>http://www.dir.ca.gov/title8/sb4a6.html</u>

Contractors should be advised that fill soil should be considered Type C soil as defined in the California Construction Safety Orders. As indicated in *Table B-1 of Article 6, Section 1541.1, Appendix B, of the California Construction Safety Orders*, excavations less-than (<) 20 feet deep within Type C soil should be sloped back no steeper than 1½:1 (horizontal:vertical), where workers are to enter the excavation. This may be impractical near adjacent existing utilities and structures; so shoring may be required depending on trench locations and



depths. Loose, non-cohesive sand and sandy gravel channels below the site should be expected to ravel and cave in unshored excavations.

During construction, soil conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor is responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and the geotechnical engineer should be maintained to facilitate construction while providing safe excavations.

3.13 <u>Sedimentation and Erosion</u>

The erosion characteristics of the unconsolidated alluvial deposits exposed on any future potential temporary cut slopes onsite is expected to be moderately susceptible to erosion. Although not currently anticipated, any manufactured slopes composed of compacted fill would be expected to be moderately susceptible to erosion.

The native soils onsite, as well as fill slopes constructed with native soils, will have a moderate susceptibility to erosion. These materials will be particularly prone to erosion during excavation and site development, especially during heavy rains.

The potential for erosion can be mitigated through the application of Best Management Practices (BMPs) and other Storm Water Pollution Prevention Plan (SWPPPs), such as temporary catchment basins and/or sandbagging to control runoff and contain sediment transport within the project site during construction. Following completion of the project, the site will be improved with structures, hardscape, landscaping and appropriate drainage infrastructure. Therefore, sedimentation and erosion impacts upon completion of construction are considered less than significant.

3.14 <u>Methane</u>

The site is <u>not</u> located within an oil field. There are four (4) oil wells (plugged and abandoned) reported to be located within a mile radius of this site and within the City of Santa Monica. For location of nearest documented Division of Oil and Gas Geothermal Resources (DOGGR) oil wells see: <u>http://maps.conservation.ca.gov/doggr.</u> The potential for methane gas hazard at the site is considered low.



3.15 Regional Subsidence

Regional ground subsidence generally occurs due to rapid and intensive removal of subterranean fluids, typically water or oil. It is generally attributed to the consolidation of sediments as the fluid in the sediment is removed. The total load of the soils in partially or fully saturated deposits is born by their granular structure and the fluid. When the fluid is removed, the load is born by the sediment alone and it settles. No reports on regional subsidence have documented subsidence in the site vicinity, and the project would not involve the removal of water or oil at the site, making the potential for ground subsidence low.

3.16 <u>Summary of Geologic and Seismic Hazards Review</u>

The results of our geologic and seismic hazards review are summarized below.

GEOLOGIC AND SEISMIC HAZARDS	FINDINGS
Fault rupture	Low Risk
Seismic Ground Shaking	Low Risk
Liquefaction	Low Risk
Seismically induced lateral displacement	Low Risk
Seismically-induced settlement	Low Risk
Seismically-induced landslide	Low Risk
Flood hazard	Low Risk
Seismically-induced flooding	Low Risk
Seiches and tsunamis	Low Risk
Slope stability and landslide	Low Risk
Soil corrosion	Low Risk
Soil expansion	Low Risk
Erosion/Sedimentation	Low Risk
Methane Gas	Low Risk
Regional Subsidence	Low Risk



Calif	ornia Code of Regulations CCR 5 – CDE Requirements
Regulations/Code	Description
14010(f)	Pursuant to Education Code sections 17212 and 17212.5, the site does not contain an active earthquake fault or fault trace.
14010(g)	Pursuant to Education Code sections 17212 and 17212.5, the site is not within an area of flood or dam flood inundation.
14010(i)	The site is not subject to the effects of moderate to high liquefaction or landslides. The potential for liquefaction at the site is considered low for the design seismic event. No landslides are mapped or known to exist at the project site or vicinity.
14011(g)(1)(A)	Seismic Hazards
Liquefaction	The project site is not located in an area mapped as potentially susceptible to liquefaction hazard (see Figure 6, Seismic Hazards Map). In addition, the historic high groundwater level at the site is greater than of 40 feet bgs as reported within the Seismic Hazard Zone Report for the Beverly Hills Quadrangle (CGS, 1998) and current groundwater level at the site is expected to be greater than 50 feet bgs. Therefore, the potential for liquefaction at the site is considered low for the design seismic event.
Subsidence	No reports on regional subsidence have documented subsidence in the site vicinity, and the project would not involve the removal of water or oil at the site, making the potential for ground subsidence low.
Expansive Soils	Expansion Index (EI) testing of two representative bulk samples from the upper 5 feet at the site indicate that the near-surface site soils have EI values ranging from 2 to 3 (see Appendix C). These test results indicate a very low expansion potential for near-surface onsite materials.
Slope Stability	The project site is not located in an area mapped as potentially susceptible to seismically-induced landslides (see Figure 6, Seismic Hazards Map). No landslides are mapped or known to exist at the project site or vicinity. The topography of the site is relatively flat, and generally slopes to the southwest. The potential for seismically-induced landslides to affect the site is low.
Dam Inundation	The site is located outside of a dam inundation area (see Figure 8, Dam Inundation Map) due to the absence of such structures near the site; therefore, the potential for earthquake-induced flooding at the site is considered low.
100- 500 Year Flooding	The site is located outside of areas recognized by the Federal Emergency Management Agency (FEMA) as 0.2% annual chance flood potential.
14011(g)(1)(B)	The site is not located within a State of California Seismic Hazard or Alquist- Priolo Special Studies Zone.



Calif	ornia Code of Regulations CCR 5 – CDE Requirements
14011(g)(1)(C)	The site may experience strong ground shaking after the proposed project is developed resulting from an earthquake occurring along one or more of the major active or potentially active faults in the southern California region. Accordingly, the project should be designed in accordance with all applicable current codes (California Building Code, 2016) and standards utilizing the appropriate seismic design parameters presented in Section 3.3.1 of this report to reduce seismic risk as defined by California Geological Survey (CGS) Chapter 2 of Special Publication 117a (CGS, 2008).
14011(g)(1)(D)	The site is not located on or near a pressure ridge. There are no known active faults traversing the site therefore the surface fault rupture is not a risk for this site.
Ed. Code 17213(a)(3)	The site is not located near an above ground or below ground pipeline that carries hazardous substances, extremely hazardous substances or hazardous wastes.





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APPENDIX A REFERENCES



APPENDIX A

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Aerial Photo Review									
Flight	Frame	Date	Scale	Agency	Location				
AXJ	26-77,	5/22/1938	1.20 000	USDA	Canto Manino Manino Quadronala				
	26-95		1:20,000		Santa Monica, venice Quadrangie				
AXJ-3K	129, 130	11/4/1952	1:20,000	USDA	Santa Monica, Beverly Hills Quadrangle				



APPENDIX B

BORING LOGS



GEOTECHNICAL BORING LOG HA-1

Project No.		11429	8 006					Data Drillad	5-25-17		
Proj	ect	-	JAMS	S - Audito	rium R	enlace	ment F	Project	Logged By	IMP	
Drill	ing Co) .	N/A			001000		10]00	Hole Diameter	<u>4</u> "	
Drilling Method			Hand	Auger					Ground Elevation	~143'	
Loc	ation	-	See F	Figure 2,	Boring	Locatio	on Mai	0	Sampled By	JMP	
		-						-		01111	
Elevation Feet	Depth Feet	z Graphic «	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description applies only to a location of the explora time of sampling. Subsurface conditions may differ at other and may change with time. The description is a simplification actual conditions encountered. Transitions between soil type gradual.	tion at the locations n of the es may be	Type of Tests
	0 -			BB-1				SM	Artificial Fill, undocumented (Afu) @ 0-1.2': Silty SAND, medium brown, dry, dense, fine sar some roots and debris (brick fragments) @ 1.2'-3.5': Silty SAND, dark brown, moist, loose to media dense, fine sand, some roots and debris (brick fragment) Quaternary-Age Old Paralic Deposits (Qol) @ 3.5'-5': Silty SAND, medium reddish brown, moist, medianse, fine sand Total depth of boring: 5 feet Groundwater not encountered Boring backfilled with onsite soils on 5/25/2017	nd, nts)	EI, CR
	15										
SAMF B C G R S T	PLE TYPI BULK S CORE S GRAB S RING S SPLIT S TUBE S	ES: AMPLE AMPLE SAMPLE AMPLE SPOON SA AMPLE	MPLE	TYPE OF TI -200 % F AL ATI CN COI CO COI CR COI CU UNI	ESTS: INES PAS ERBERG NSOLIDA LLAPSE RROSION DRAINED	SING LIMITS TION TRIAXIA	DS EI H MD PP L RV	DIRECT EXPAN HYDRC MAXIM POCKE R VALL	T SHEAR SA SIEVE ANALYSIS SION INDEX SE SAND EQUIVALENT METER SG SPECIFIC GRAVITY UM DENSITY UC UNCONFINED COMPRESSIVE STRENGT IT PENETROMETER UU UNCONSOLIDATED UNDRAINED TRIAXI JE	TH AL	X

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG HA-2

Project No. Project Drilling Co.		11428 JAMS N/A	8.006 6 - Audito	rium Ro	eplace	ment I	Project	Date Drilled 5-2 Logged By JM Hole Diameter 4"	25-17 P		
Drilling Method			Hand	Auger					Ground Elevation _~1	43'	
Loc	ation		See F	igure 2,	Boring	Locatio	Sampled ByJM	Р			
Elevation Feet	Depth Feet	ح Graphic در	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION This Soil Description applies only to a location of the exploration a time of sampling. Subsurface conditions may differ at other locat and may change with time. The description is a simplification of t actual conditions encountered. Transitions between soil types ma gradual.	at the ions he ay be	Type of Tests
	0 			BB-1				SM	Artificial Fill. undocumented (Afu) @ 0-0.7': Silty SAND, light yellow brown, dry, dense, fine sand @ 0.7'-3': Silty SAND, dark brown, moist, loose to medium dense, fine sand, trace debris Quaternary-Age Old Paralic Deposits (Qol) @ 3'-5': Silty SAND, medium reddish brown, moist, medium dense, fine sand Total depth of boring: 5 feet Groundwater not encountered Boring backfilled with onsite soils on 5/25/2017		EI, CR
SAMI B C G R S T	15 DLE TYP BULK S CORE S GRAB S RING S SPLIT S TUBE S	ES: GAMPLE SAMPLE SAMPLE AMPLE SPOON SA GAMPLE	MPLE	TYPE OF T -200 % F AL AT CN CO CO CO CR CO CU UN	ESTS: INES PAS FERBERG NSOLIDA LLAPSE RROSION DRAINED		DS EI H MD PP L RV	DIRECT EXPAN HYDRO MAXIM POCKE R VALU	SHEAR SA SIEVE ANALYSIS SION INDEX SE SAND EQUIVALENT METER SG SPECIFIC GRAVITY JM DENSITY UC UNCONFINED COMPRESSIVE STRENGTH T PENETROMETER UU UNCONSOLIDATED UNDRAINED TRIAXIAL JE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

APPENDIX C

GEOTECHNICAL LABORATORY TEST RESULTS





TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

SMMUSD/John Adams Middle School

Project Name:	Auditorium	Tested By :	GB/ACS	_Date: 05/31/17
Project No. :	11428.006	Data Input By:	J. Ward	Date: 06/05/17

Boring No.	HA-1	HA-2	
Sample No.	BB-1	BB-1	
Sample Depth (ft)	0-5	0-5	
Soil Identification:	Brown SM	Dark yellowish brown SM	
Wet Weight of Soil + Container (g)	130.86	125.01	
Dry Weight of Soil + Container (g)	130.00	124.14	
Weight of Container (g)	59.25	59.83	
Moisture Content (%)	1.22	1.35	
Weight of Soaked Soil (g)	100.17	100.06	

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	16	60	
Crucible No.	10	12	
Furnace Temperature (°C)	860	860	
Time In / Time Out	12:05/12:50	12:05/12:50	
Duration of Combustion (min)	45	45	
Wt. of Crucible + Residue (g)	22.3564	22.6893	
Wt. of Crucible (g)	22.3531	22.6880	
Wt. of Residue (g) (A)	0.0033	0.0013	
PPM of Sulfate (A) x 41150	135.79	53.50	
PPM of Sulfate, Dry Weight Basis	137	54	

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	30	30	
ml of AgNO3 Soln. Used in Titration (C)	0.5	0.5	
PPM of Chloride (C -0.2) * 100 * 30 / B	30	30	
PPM of Chloride, Dry Wt. Basis	30	30	

pH TEST, DOT California Test 643

pH Value	7.08	7.50	
Temperature °C	21.9	22.0	



SOIL RESISTIVITY TEST DOT CA TEST 643

Project Name:	SMMUSD/John Adams Middle School Auditorium	Tested By :	A. Santos	Date:	06/05/17
Project No. :	11428.006	Data Input By:	J. Ward	Date:	06/05/17
Boring No.:	HA-1	Depth (ft.) :	0-5		

Sample No. : BB-1

Soil Identification:* Brown SM

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	20	16.79	9500	9500
2	30	24.57	9300	9300
3	40	32.36	9800	9800
4				
5				

Moisture Content (%) (MCi)	1.22		
Wet Wt. of Soil + Cont. (g)	130.86		
Dry Wt. of Soil + Cont. (g)	130.00		
Wt. of Container (g)	59.25		
Container No.			
Initial Soil Wt. (g) (Wt)	130.00		
Box Constant	1.000		
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100			

Min. Resistivity	Moisture Content	Sulfate Content	Chloride Content	e Content Soil pH	
(ohm-cm)	(%)	(ppm)	(ppm)	pH Temp. (°C	
DOT CA	A Test 643	DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
9290	23.7	137	30	7.08 21.9	





SOIL RESISTIVITY TEST DOT CA TEST 643

Project Name:	SMMUSD/John Adams Middle School Auditorium	Tested By :	A. Santos	Date:	06/05/17
Project No. :	11428.006	Data Input By:	J. Ward	Date:	06/05/17
Boring No.:	HA-2	Depth (ft.) :	0-5		

Sample No. : BB-1

Soil Identification:* Dark yellowish brown SM

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	20	16.95	7500	7500
2	30	24.74	7400	7400
3	40	32.54	8100	8100
4				
5				

Moisture Content (%) (MCi)	1.35		
Wet Wt. of Soil + Cont. (g)	125.01		
Dry Wt. of Soil + Cont. (g)	124.14		
Wt. of Container (g)	59.83		
Container No.			
Initial Soil Wt. (g) (Wt)	130.00		
Box Constant	1.000		
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100			

Min. Resistivity	Moisture Content	Sulfate Content	Chloride Content	So	il pH
(ohm-cm)	(%)	(ppm)	(ppm)	pH Temp. (°0	
DOT CA	A Test 643	DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
7365	23.0	54	30	7.50 22.0	





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EXPANSION INDEX of SOILS ASTM D 4829

	SMMUSD/John Adams Middle School				
Project Name:	Auditorium	Tested By:	S. Felter	Date:	05/30/17
Project No .:	11428.006	Checked By:	J. Ward	Date:	06/05/17
Boring No.:	<u>HA-1</u>	Depth (ft.):	0-5		
Sample No.:	<u>BB-1</u>				
Soil Identification:	Brown silty sand (SM)				_
	Dry Wt of Coll Cont (a)	1000	00		

Dry Wt. of Soil + Cont. (g)	1000.00
Wt. of Container No. (g)	0.00
Dry Wt. of Soil (g)	1000.00
Weight Soil Retained on #4 Sieve	0.00
Percent Passing # 4	100.00

MOLDED SPEC	MEN	Before Test	After Test
Specimen Diameter	(in.)	4.01	4.01
Specimen Height	(in.)	1.0000	1.0015
Wt. Comp. Soil + Mold	(g)	592.00	428.70
Wt. of Mold	(g)	175.90	0.00
Specific Gravity (Assum	ed)	2.70	2.70
Container No.		0	0
Wet Wt. of Soil + Cont.	(g)	837.90	604.60
Dry Wt. of Soil + Cont.	(g)	774.40	560.42
Wt. of Container	(g)	0.00	175.90
Moisture Content	(%)	8.20	11.49
Wet Density	(pcf)	125.5	129.1
Dry Density	(pcf)	116.0	115.8
Void Ratio		0.453	0.456
Total Porosity		0.312	0.313
Pore Volume	(cc)	64.6	64.9
Degree of Saturation (%	6) [S meas]	48.8	68.1

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
05/30/17	11:35	1.0	0	0.1210
05/30/17	11:45	1.0	10	0.1210
	Ac	d Distilled Water to the	e Specimen	
05/30/17	12:30	1.0	45	0.1215
05/31/17	6:21	1.0	1116	0.1225
05/31/17	7:32	1.0	1187	0.1225

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EXPANSION INDEX of SOILS ASTM D 4829

	SMMUSD/John Adams Middle School				
Project Name:	Auditorium	Tested By:	S. Felter	Date:	05/30/17
Project No .:	11428.006	Checked By:	J. Ward	Date:	06/05/17
Boring No.:	HA-2	Depth (ft.):	0-5		
Sample No.:	BB-1				
Soil Identification:	Dark yellowiish brown silty sand (SM)				

Dry Wt. of Soil + Cont. (g)	1000.00
Wt. of Container No. (g)	0.00
Dry Wt. of Soil (g)	1000.00
Weight Soil Retained on #4 Sieve	0.00
Percent Passing # 4	100.00

MOLDED SPECI	MEN	Before Test	After Test
Specimen Diameter	(in.)	4.01	4.01
Specimen Height	(in.)	1.0000	1.0020
Wt. Comp. Soil + Mold	(g)	624.70	427.27
Wt. of Mold	(g)	208.60	0.00
Specific Gravity (Assume	ed)	2.70	2.70
Container No.		0	0
Wet Wt. of Soil + Cont.	(g)	824.10	635.87
Dry Wt. of Soil + Cont.	(g)	757.40	591.02
Wt. of Container	(g)	0.00	208.60
Moisture Content	(%)	8.81	11.73
Wet Density	(pcf)	125.5	128.6
Dry Density	(pcf)	115.4	115.1
Void Ratio		0.461	0.464
Total Porosity		0.316	0.317
Pore Volume	(cc)	65.4	65.8
Degree of Saturation (%	b) [S meas]	51.5	68.2

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)			
05/30/17	11:10	1.0	0	0.1650			
05/30/17	11:20	1.0	10	0.1645			
	Add Distilled Water to the Specimen						
05/30/17	12:31	1.0	71	0.1650			
05/31/17	6:22	1.0	1142	0.1670			
05/31/17	7:30	1.0	1210	0.1670			

Expansion Index (EI meas)	=	((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	3
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APPENDIX D

CEQA QUESTIONNAIRE FOR GEOLOGY AND SOILS



Environmental Checklist Form

NOTE: The following is a sample form and may be tailored to satisfy individual agencies' needs and project circumstances. It may be used to meet the requirements for an initial study when the criteria set forth in CEQA Guidelines have been met. Substantial evidence of potential impacts that are not listed on this form must also be considered. The sample questions in this form are intended to encourage thoughtful assessment of impacts, and do not necessarily represent thresholds of significance.

Lead agency name and address:
Contact person and phone number:
Project location:
Project sponsor's name and address:
General plan designation: 7. Zoning:
Description of project: (Describe the whole action involved, including but not limited to
phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)
phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)
phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.) Surrounding land uses and setting: Briefly describe the project's surroundings:

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

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

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

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

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

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

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

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

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

Signature

Date

Signature

EVALUATION OF ENVIRONMENTAL IMPACTS:

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

SAMPLE QUESTION Issues:

4526), or timberland zoned Timberland

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS Would the project:				
a) Have a substantial adverse effect on a scenic vista?				
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				
c) Substantially degrade the existing visual character or quality of the site and its surroundings?				
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non- agricultural use?				
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Production (as defined by Government Code section 51104(g))?		Ĩ		
d) Result in the loss of forest land or conversion of forest land to non-forest use?				
de) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				
III. AIR QUALITY Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?				
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?				
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?				
d) Expose sensitive receptors to substantial pollutant concentrations?				
e) Create objectionable odors affecting a substantial number of people?				
IV. BIOLOGICAL RESOURCES Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?				
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		_		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				
V. CULTURAL RESOURCES Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?				
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?				
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				
d) Disturb any human remains, including those interred outside of formal cemeteries?				
VI. GEOLOGY AND SOILS Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:			\times	
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			\boxtimes	
ii) Strong seismic ground shaking?			\mathbf{X}	
iii) Seismic-related ground failure, including liquefaction?			$\left X \right $	
iv) Landslides?				\times

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Result in substantial soil erosion or the loss of topsoil?			\mathbf{X}	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			\boxtimes	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?			\boxtimes	
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?			\boxtimes	
VII. GREENHOUSE GAS EMISSIONS Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?				
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				
VIII. HAZARDS AND HAZARDOUS MATERIALS - Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?				
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
for people residing or working in the project area?				
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				
IX. HYDROLOGY AND WATER QUALITY Would the project:				
a) Violate any water quality standards or waste discharge requirements?				
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre- existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				
f) Otherwise substantially degrade water quality?				
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				
j) Inundation by seiche, tsunami, or mudflow?				
X. LAND USE AND PLANNING - Would the project:				
a) Physically divide an established community?				
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				
XI. MINERAL RESOURCES Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				
b) Result in the loss of availability of a locally- important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				
XII. NOISE Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?				
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				
XIII. POPULATION AND HOUSING Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				
XIV. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?				
Police protection?				
Schools?				
Parks?				
Other public facilities?				
XV. RECREATION				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				
XVI. TRANSPORTATION/TRAFFIC Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?				
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				
e) Result in inadequate emergency access?				
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				
XVII. UTILITIES AND SERVICE SYSTEMS Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
could cause significant environmental effects?		-		
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				
g) Comply with federal, state, and local statutes and regulations related to solid waste?				
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?				
c) Does the project have environmental effects which will cause substantial adverse effects on				

Note: Authority cited: Sections 21083, 21083.05, Public Resources Code. Reference: Section 65088.4, Gov. Code; Sections 21080, 21083.05, 21095, Pub. Resources Code; *Eureka Citizens for Responsible Govt. v. City of Eureka* (2007) 147 Cal.App.4th 357; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th at 1109; *San Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656.

Revised 2009

human beings, either directly or indirectly?