SENT VIA EMAIL (PlanningCommission@cityofdavis.org)

May 23, 2018

Planning Commission
City of Davis
23 Russell Boulevard
Davis, California 95616

RE: Planning Commission
May 23, 2018 Meeting, Agenda Item 6D – Davis Live Student Housing

Dear Davis Planning Commissioners:

This letter provides comments on the Davis Live residential development project, which proposes a 71-unit, 440-bed student housing development (the “Project”). Davis Live would provide only 53 beds—or 12% of the total—as affordable housing, which is insufficient to meet the City of Davis’ (the “City”) affordable housing ordinance. And like the recently approved Nishi and Lincoln40 projects, the applicant’s affordable plan limits these affordable “beds” to students, which violates state, regional, and local plans and policies.2

The Project also violates the California Environmental Quality Act (“CEQA”) and state Planning and Zoning laws. While staff asserts that the Project is completely exempt from CEQA as a transit priority project under Public Resources Code3 section 21155.1, that exemption does not apply for reasons explained below. Staff has also failed to show that the Project would be consistent with the City’s General Plan. The proposal to create a new land use designation—Residential Very High Density—does not relieve the City of demonstrating consistency with the existing General Plan. Yet, the City’s current consistency analysis relies on the proposed new designation to show consistency and fails to consider several fundamental inconsistencies with existing goals and policies. These problems require a Project denial.

1 Planning Application #17-21, General Plan Amendment #01-18, Rezone #01-18, Final Planned Development #02-18, Design Review #02-18, Development Agreement #01-18.

2 For a more complete discussion of the City’s pattern and practice of approving affordable housing plans that discriminate against low-income families, please see out letter to the Social Services Commission, attached as Exhibit A.

3 All further references are to the Public Resources Code unless otherwise noted.
It is important to note that the City has not been transparent in its entitlement process for this Project. Few documents have been circulated for public review. Because supporting documents have been withheld (to the extent they exist at all), this Commission should continue its decision until all documents relied on have been circulated. Doing so will allow the public to consider and comment on their adequacy.

I. The Project Is Not Exempt From CEQA

To qualify for the CEQA exemption pursuant to section 21155.1, the Project must: (1) comply with eight environmental criteria, seven land use criteria, and one of three affordable housing requirements, and (2) be consistent with and incorporate mitigation from the Sacramento Area Council of Government’s (“SACOG”) 2016 Metropolitan Transportation Plan/Sustainable Communities Strategy (“2016 MTP/SCS”).

The City’s determination that the Project is exempt from CEQA will be overturned if it has failed to proceed in a manner required by law, or if its factual determination is not supported by substantial evidence. (Public Resources Code, § 21168.5; Sierra Club v. County of Sonoma (2017) 11 Cal.App.5th 11, 24.) “In determining whether an agency’s findings concerning the use of a statutory exemption from CEQA may be upheld, [courts] review the administrative record to see that substantial evidence supports each element of the exemption. There must be substantial evidence that the [activity is] within the exempt category of projects.” (Great Oaks Water Co. v. Santa Clara Valley Water Dist. (2009) 170 Cal.App.4th 956, 973, citations and internal quotes omitted.) Here, staff asserts that the Project is consistent with section 21155.1. Yet, substantial evidence does not support the consistency determination, and in several places, staff has failed to proceed in the manner required by law. For these reasons, the Project is not exempt from CEQA and the City must prepare an initial study to determine whether the Project requires an Environmental Impact Report.

A. The Project Does Not Meet the Affordable Requirements of Section 21155.1, Subdivision (c) Because Its Affordable Units Are Restricted to Students

Section 21155.1, subdivision (c) requires that, in order to qualify for the transit priority project CEQA exemption, the Project must meet at least one of three affordable housing criteria. Staff asserts that the Project meets the requirements of subdivision (c)(1), which provides:

(1) The transit priority project meets both of the following:

(A) At least 20 percent of the housing will be sold to families of moderate income, or not less than 10 percent of the housing will be rented to families of low income, or not less than 5 percent of the housing is rented to families of very low income.
(B) The transit priority project developer provides sufficient legal commitments to the appropriate local agency to ensure the continued availability and use of the housing units for very low, low-, and moderate-income households at monthly housing costs with an affordable housing cost or affordable rent, as defined in Section 50052.5 or 50053 of the Health and Safety Code, respectively, for the period required by the applicable financing. Rental units shall be affordable for at least 55 years. Ownership units shall be subject to resale restrictions or equity sharing requirements for at least 30 years. (Emphasis added.)

The Project’s affordable housing component is set forth in what the applicant calls the Davis Live Dream Program (the “Program”). As the Program states, the affordable units will be only available to full-time students or households containing full time students, who “have verified full-time status commencing at the time their lease commences [ ], with a schedule from any community college or four-year college or university that reflects full-time status expected to remain throughout the term of the lease.” Staff argues that the Program meets the requirements quoted above by “ensur[ing] that at least 10 percent of the proposed units are reserved for low income renters.” (Emphasis added.) But the statute does not use the noun “renters,” it requires affordable units for “families.” Further, the Program does not even apply to “renters” generally but is narrowly restricted to “students” only. Thus, as proposed, the Project does not meet the requirements of section 21155.1, subdivision (c), and is not exempt from CEQA.

In addition to the Program’s restrictions, its structure is entirely inappropriate for and inaccessible to families. The Program states that the affordable component will be provided through “a fixed number of double-occupancy bedrooms” “integrated throughout the project among market-rate beds.” These double-occupancy bedrooms will be within very large apartments ranging from four- to eight-bedroom units. Thus, even if the affordable “beds” were available to families, the accommodations are unsuitable for them. Few families would likely allow a young child to be roommates with a college student from outside the family. It would be unreasonable to expect a young family to share a dwelling unit space (including a kitchen and living room) with college students. Thus, the Program would have to be redesigned to accommodate families.

B. The City Must Consider Whether the Project Will Harm Special-Status Species

Section 21155.1, subdivision (a)(2)(A) provides in pertinent part that a project cannot “harm any species protected by the federal Endangered Species Act [ ], the Native Plant Protection Act [ ], or the California Endangered Species Act [ ].” In its consistency analysis, staff ignores this requirement, and only analyzes whether the Project site “provide[s] suitable habitat for any species protected by the federal Endangered Species
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Act of 1973, the Native Plant Protection Act, or the California Endangered Species Act.” But whether a project will “harm” special-status species is different from whether a project site contains habitat for those species. Harm encompasses a greater range of potential impacts, all of which must be considered. The City’s failure to consider all harm is a failure to proceed in a manner required by law.

To illustrate, both Project construction and operational phases stand to “harm” special-status bird species by, for instance, disturbing nesting or breeding at adjacent sites. There is a real risk of harming Swainson’s hawks, as these raptors have been observed nesting and breeding within the City in residential neighborhoods very similar to that surrounding the Project site. (See Occurrence Reports attached as Exhibit B.) Further, Oxford Circle Park, located directly across the street from the Project site, provides suitable habitat for many special-status species. Yet, it does not appear that the City has incorporated the regulatory measures necessary to ensure that the Project would not harm these species.

In addition, the City’s conclusions with respect to on-site habitat is not supported by substantial evidence. No biological reports or surveys were included with the staff report and are apparently not publicly available. And although staff states, for example, that the Project site still contains trees, it provides no specifics such as tree species, height, health, or whether they have a history of being nesting sites. Without this information the City’s factual determination are not supported by substantial evidence. And without sufficient survey data, the City cannot determine what regulatory measures must be implemented to prevent harm.

C. A Preliminary Endangerment Assessment Must Be Prepared for the Project

Section 21155.1, subdivision (a)(4) requires that “[t]he site of the transit priority project [be] subject to a preliminary endangerment assessment prepared by an environmental assessor to determine the existence of any release of a hazardous substance on the site and to determine the potential for exposure of future occupants to significant health hazards from any nearby property or activity.” Section 21155.1, subdivision (a)(4)(B) provides that “[i]f a potential for exposure to significant hazards from surrounding properties or activities is found to exist, the effects of the potential exposure shall be mitigated to a level of insignificance in compliance with state and federal requirements.”

Staff apparently asserts that preliminary endangerment assessments (“PEA”) are only “required for school projects per Government Code Section 25395.21.” Yet, Section 21155.1, subdivision (a)(4) plainly does not contain that limitation.
PEAs are important because they require more than a Phase 1 analysis. “Specific requirements of the PEA that are not typically required for these other types of investigations include the site-specific human health and ecological screening evaluations, public participation requirements, data collection, and scoping activities.” (See Department of Toxic Substances Control, Preliminary Endangerment Assessment Guidance Manual, attached as Exhibit C.) For purposes of section 21155.1, the PEA is critical because it provides additional information required by statute; namely, information related to health hazardous from nearby property and activities, and related screening evaluations. Thus, the City’s decision to rely on a Phase 1 does not meet the requirements of a PEA, and that decision was prejudicial because it did not include the necessary procedures or information.

Because the City failed to prepare the required PEA, that failure is prejudicial, and substantial evidence does not support the City’s conclusions, the Project does not qualify for the transit priority exemption.

D. The City Must Analyze Whether the Project Will Risk Public Health Exposures That Exceed Any Standards

Section 21155.1, subdivision (a)(6)(C) provides that, to qualify for the CEQA exemption, the Project cannot “[r]isk [] public health exposure at a level that would exceed the standards established by any state or federal agency.” (Emphasis added.) A violation of any standard will make a project ineligible for the exemption.

Staff has not meaningfully analyzed this requirement and has overlooked the potential for obvious impacts related to air quality and noise, both during construction and operation phases. In full, staff’s consistency analysis provides:

As discussed previously, a Phase I Environmental Site Assessment was prepared for the project site to determine the potential for hazardous substances to be present within the project site. The Phase I Environmental Site Assessment determined that releases of hazardous substances had not occurred within the site, and hazardous substances are not present within the site. Therefore, the proposed project would not have the potential to risk public health through the exposure of nearby residents or future residents to hazardous materials.

At the outset, staff’s analysis is far too narrow, as it apparently only considered public health risk exposure from hazardous substances within the site. The Legislature plainly intended for a more comprehensive analysis that would include, for example, air quality and noise impacts. Given the proximity to nearby sensitive receptors (including adjacent residential and park uses), it is critical that the City consider whether construction would violate any agency’s air quality standards, including thresholds for toxic air contaminants.
(“TAC”) and ultrafine particulate matter. The same is true for construction noise impacts; the City must ensure that indoor and outdoor noise thresholds are not exceeded. Operational impacts on these same sensitive receptors must also be analyzed.

There are also real concerns of health impacts on future residents. For example, it is reasonable to expect high levels of TACs and noise thresholds on future residents from nearby roadways, such as State Route 113 and Russel Boulevard. According to a recent Caltrans Transportation Concept Report on State Route 113 (attached as Exhibit D), the highway segment near Davis is the most congested and will only become more crowded over time as commuters attempt to bypass heavy traffic on the Interstate 5. Specifically, merge points along the route (i.e. on/off ramps) are the most congested. Because the Project site is located near such an off/off ramp, in the most crowded segment of State Route 113, it is reasonable to infer that TAC impacts—often associated with traffic congestion—would have health impacts on future residents more than applicable standards. And as the California Supreme Court recently explained, “[a]lthough CEQA does not generally require an evaluation of the effects of existing hazards on future users of the proposed project, it calls for such an analysis in several specific contexts [including] . . . housing development projects . . . [under Public Resources Code section] 21155.1, subd. (a)(4), (6).” (California Building Industry Assn. v. Bay Area Air Quality Management Dist. (2015) 62 Cal.4th 369, 391.) Thus, the City must consider these health impacts.

Without an analysis of these issues, among others, the City has not have proceeded in the manner required by law, and its conclusions are not supported by substantial evidence.

E. The City Did Not Analyze Whether Existing Utilities Are Adequate to Serve the Project and Other Recently Approved Projects

Section 21155.1, subdivision (a)(1) requires that the “transit priority project and other projects approved prior to the approval of the transit priority project but not yet built can be adequately served by existing utilities.” (Emphasis added.) Although the City again failed to circulate its supporting documents (here a report prepared by Cunningham Engineering), it appears from the staff report that the City did not consider other recently approved projects when analyzing existing utility capacity. For example, the City asserts that “the existing sanitary sewer infrastructure maintains adequate capacity to serve operation of the proposed project in conjunction with existing uses.” Thus, the analysis for this utility does not appear to consider other recently improved projects; the same is true for the other utilities analyzed. Furthermore, it appears that the City did not analyze all required utilities, such as water supply and landfill capacity.
For these reasons, the City has not proceeded in the manner required by law and its conclusions are not supported by substantial evidence.

**F. The Project Must Meet Water Efficiency Requirements**

Section 21155.1, subdivision (a)(8) requires that “the buildings and landscaping designed to achieve 25 percent less water usage than the average household use in the region.” Staff asserts that “Tier 1 [of the CALGreen Code] includes water efficiency requirements, which, combined with other water conservation measures required by the City would be anticipated to reduce water use to achieve 25 percent less water usage than the average household in the region.” Staff further asserts that “[t]he Conditions of Approval for the proposed project will require that the project applicant submit confirmation of compliance with these energy and water efficiency requirements prior to issuance of building permits.” Yet, the Conditions of Approval do not reflect staff’s assertion. For instance, under “Water Efficient Landscaping Requirements” the actual requirement is for the Project to “comply with the Water Efficient Landscape requirements of the City as required by the State.” Compliance with existing regulations would only provide water usage consistent with average households and does not require 25% less water use for landscaping, as required. Accordingly, the City has not met this requirement and the Project is not exempt from CEQA.

**G. By Inappropriately Piecemealing the Demolition Phase, the City Has Failed to Analyze All Impacts**

CEQA defines a “project” as comprising “the whole of an action” that has the potential to result in a direct or reasonably foreseeable indirect physical change to the environment. (14 Cal. Code Regs., § 15378, subd. (a).) Piecemeal environmental review is not permitted. (See, e.g., *Citizens Ass'n for Sensible Dev. v County of Inyo* (1985) 172 Cal.App.3d 151, 167 [county improperly prepared negative declaration for general plan amendment and rezoning for proposed shopping center followed by later negative declaration for subdivision map and road abandonment for same project, because, by bifurcating review, county failed to examine potential impacts of entire development].)

Here, according to the applicant, the Project site housed the Sigma Nu Fraternity until it was demolished in January 2018, less than one year after the applicant purchased the property. This recent demolition should have considered during the City’s review as part of the Project. Yet, it was not.

This piecemeal analysis impacted the City’s consideration. For example, Section 21155.1, subdivision (b)(3) requires that “[t]he transit priority project [] not result in any net loss in the number of affordable housing units within the project area.” Yet, when analyzing consistency with this requirement, staff asserted that “[a]lthough the project
site was previously developed for residential uses, the site is currently vacant [and that as a result] the project site does not contain any affordable housing units.” This conceals how many dwelling units the prior housing contained, and, in so doing, removed any consideration of existing units when calculating “net loss.” For instance, it is reasonable to infer that the prior housing contained at least 50 beds, all of which could have been priced to qualify as affordable units. Because the Project is only providing approximately 50 affordable beds, it is reasonable to infer there could be a net loss in the quantity of affordable housing.

The same piecemeal concerns apply to the analysis of most all other requirements. For this reason alone, the City is precluded from relying on the CEQA exemption set forth in section 21155.1.

H. The Project Is Not Exempt from CEQA Because the City Has Not Incorporated All Applicable Mitigation Measures from the 2016 MTP/SCS Environmental Impact Report

The foundation of the transit priority CEQA exemption is consistency with an approved sustainable communities strategy plan, as the exemption “applies only to a transit priority project that is consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy.” (Section 21155, subd. (a).) Section 21155.1, subdivision (b)(5) requires that “[a]ny applicable mitigation measures or performance standards or criteria set forth in the prior environmental impact reports, and adopted in findings, have been or will be incorporated into the transit priority project.”

Here, the 2016 MTP/SCS is the applicable sustainable communities strategy. Yet, the City has not incorporated any applicable mitigation measures from that plan’s EIR. Instead, staff asserts that the “City’s General Plan is the only document with mitigation measures or performance standards applicable to the proposed project.” But that assertion is legally incorrect given the requirement for consistency with the 2016 MTP/SCS. The 2016 MTP/SCS’s Mitigation Monitoring and Reporting Program (“MMRP”), a nearly 80-page document, contains mitigation that SACOG designed for nearly any development that relies on the 2016 MTP/SCS (attached as Exhibit E). The Project is no exception. As explained in the MMRP, Davis, as the “[i]mplementing/lead agency,” is specifically delegated “[r]esponsibility for [o]versight” over these mitigation measures. The Legislature required incorporation of these mitigation measures to ensure transit priority projects contain adequate mitigation. Since the Project does not incorporate any of the applicable mitigation measures (or performance standards or criteria) it does not qualify for the CEQA exemption.
Rather than incorporate mitigation from the 2016 MTP/SCS MMRP, staff asserts that the City’s General Plan “includes self-mitigating goals, policies, standards, and actions designed to reduce the potential environmental impacts that could result from implementation of the General Plan.” However, there is no explanation for how this Project, which requests a General Plan Amendment to apply a brand-new land use designation and new development standards, could have been considered by the existing General Plan. Because the impacts of this Project, especially in conjunction with the many recently approved projects that include General Plan Amendments, could not have been analyzed or had their impacts addressed by the purported “self-mitigating” measures, staff’s assertion is legally incorrect. Put differently, the Project is inconsistent with existing General Plan land use designations, zoning, and development standards, which precludes reliance on mitigation purportedly incorporated to address impacts from those existing standards in the City’s General Plan.

The Project must be denied until it incorporates all of the 2016 MTP/SCS EIR’s applicable mitigation measures.

II. The City’s General Plan Consistency Analysis Is Deficient

A General Plan and its elements and parts thereof must comprise an integrated, internally consistent, and compatible statement of policies. (Gov. Code, § 65300.5.) The General Plan must be “consistent within itself.” (Sierra Club v. Kern County Board of Supervisors (1981) 126 Cal.App.3d 698, 703.) Thus, before acting on a proposed amendment, the government entity must show that it will be consistent with the existing General Plan.

Similarly, “the propriety of virtually any local decision affecting land use and development depends upon consistency with the application general plan and its elements.” (Citizens of Goleta Valley v. Board of Supervisors (1990) 52 Cal.3d 535, 570.) “A project is inconsistent if it conflicts with a general plan policy that is fundamental, mandatory, and clear.” (Endangered Habitats League, Inc. v. County of Orange (2005) 131 Cal.App.4th 777, 782.) Accordingly, all entitlements must be denied if the Project is inconsistent with the General Plan.

Here, the City has proposed creating a new General Plan land use designation for “Residential Very High Density,” which it would simultaneously create and apply to the Project. The new land use designation would allow for densities not exceeding 70 units per acre. Thus, in addition to demonstrating that the Project is consistent with the General Plan, because the City is creating a new land use designation that could be used for future projects, it must show that the new land use designation is consistent with the existing General Plan. Staff have not, however, provided this consistency analysis.
With respect to the Project’s consistency, instead of analyzing consistency with existing General Plan policies and goals, staff apparently rely on consistency with the new proposed land use designation and development standards. Yet, that is a legally incorrect method of showing consistency, which must be based on existing General Plan goals and policies.

An examination of existing goals and policies illustrates fundamental inconsistencies. Looking at a few examples that staff relied on for demonstrating consistency shows that the Project is fundamentally inconsistent with the General Plan.

- Policy LU A.1 – In infill projects, respect setback requirements, preserve existing greenbelts and greenstreets, and respect existing uses and privacy on adjacent parcels.
  - The Project does not respect Code-requre setback requirements, which require front and back setbacks of 35 feet and side setbacks of 30 feet. The Project proposes 10-foot setbacks—less than one-third than required.
- Policy LU A.3 – Require a mix of housing types, densities, prices and rents, and designs in each new development area.
  - The Project, which will only rent “beds,” does not provide a mix of housing types or densities. All units are extremely large, and, in any case, are not even available by the dwelling unit. Thus, the Project effectively provides one housing type and is inconsistent with this policy for that reason.
- Policy HOUSING 1.1 – Encourage a variety of housing types that meet the housing needs of an economically and socially diverse Davis.
  - The Project is also inconsistent with this Policy for the reason explained above.
- Policy HOUSING 1.3 – Encourage the construction of housing to meet the needs of single persons and households with children with extremely low, very low, and low incomes.
  - The Project’s affordable housing Program is strictly limited to and designed for students only. Thus, the Project would not meet the needs of low-income households with children and is inconsistent with this Policy.\(^4\)

Further, staff has not analyzed how the Project is consistent with the General Plan given the proposed deviations from existing development standards. For example, the Project is severely underparked. City Code apparently provides that two parking spaces are required per three-bedroom unit. However, as noted above, the Project does not

\(^4\) For an additional discussion of how the affordable Program is inconsistent with the General Plan, please see our letter to the Social Services Commission, attached as Exhibit A.
contain even one three-bedroom unit—all have more bedrooms, some almost three times that. Applying the same ratio of bedrooms to parking spaces as set forth in the staff report (two parking spaces per three-bedroom unit), results in a need for 293 parking spaces, more than four times the 71 parking spaces proposed. This underparking will have secondary impacts on the surrounding neighborhood, especially the adjacent park, as future residents are forced to rely on nearby street parking.

It must be emphasized—because staff have largely failed to fully consider it—that the Project proposes an extremely dense unit mix, with units containing four- to eight-bedrooms, and many bedrooms designated double-occupancy. As a result, it would be more appropriate for the land use designation to consider beds per acre, or anticipated residents per acre, since, under the circumstances, those metrics more accurately quantify density and intensity of use. Staff recognizes that “[t]he proposed project contains a greater bedroom count and projected occupant number than what is typical of traditional multifamily development.” Yet, the unusually high density is only acknowledged for purposes of calculating development fees, where a 1.4303 times multiplier is proposed, and is ignored when assessing General Plan consistency.

III. Conclusion

Davis Live is not what the City needs. It has already approved other large-scale student housing developments, which have tied up all new affordable units and dedicated them to students. The City’s apparent attempt to rush this Project through the entitlement process, hastily amend its General Plan, and skip necessary environmental review go against established law and City policy.

We urge the Commission to deny the Project until environmental and health issues are fully examined and the Project is appropriately modified to, at minimum, address the needs of all Davis low-income renters.

Thank you for your consideration of these important issues.

Very truly yours,

SOLURI MESERVE
A Law Corporation

By: Patrick M. Soluri

PMS/nrs
Attachments: Exhibit A, Comment Letter to the Social Services Commission
Exhibit B, California Department of Fish and Wildlife Occurrence Report
Exhibit C, California Department of Toxic Substances Control Preliminary Endangerment Assessment Guidance Manual
Exhibit D, California Department of Transportation Concept Report on State Route 113
Exhibit E, SACOG MTP/SCS MMRP
Dear Davis Social Services Commissioners:

Davis Coalition for Sensible Planning submits this letter to provide comments on the Davis Live development project specifically, and to address the City of Davis’ (the “City’s”) recent pattern and practice of approving affordable housing plans that limit eligibility to students only. This limitation violates state, regional, and local law and policies by discriminating against families, and obstructs achievement of many affordable housing goals. In the interest of all Davis residents, and residents of the greater region and state of California, the Social Services Commission should recommend denial of any further residential projects—including Davis Live—that do not provide affordable housing to all eligible citizens. The dire housing shortages affect all of Davis’ residents, and families struggling to make ends meet should not face additional hardships when attempting to secure what little new affordable housing units are being developed.

I. The City’s Pattern and Practice of Restricting Affordable Housing to Students Only

Since this past January, the City has approved two major residential development projects devoted to student housing, and is now considering Davis Live as a third. The first, the revised Nishi Project, includes 700 multifamily units with approximately 2,200 total “beds.” Of these, the City has approved a development agreement and affordable housing plan that would provide 330 affordable beds.¹ Yet, the development agreement

¹ http://cityofdavis.org/home/showdocument?id=9031. Please consider all websites cited in this letter as being incorporated in full.
expressly provides that all of these beds would be restricted to students only, and would not be available to otherwise eligible families or single workforce citizens.

Second, the Lincoln40 project will similarly have negative effects on low-income families and individuals. Lincoln40’s plans include 130 units of student-oriented housing, with a total of 473 bedrooms, of which 235 bedrooms will be designed specifically for double occupancy, for a total of 708 beds. The project’s development agreement and affordable housing plan requires that 71 beds be designated affordable, all of which will be located in double occupancy rooms. These beds will be part of large shared apartments ranging from three-to-five bedrooms, with the majority of apartments containing 4–bedrooms. And although the development agreement appears to have opened eligibility to “residents,” the applicant stated at the City Council’s public hearing for the project that, in fact, the affordable beds will be limited to students. Further, whether or not there are express restrictions to students only, by structuring the affordable plan so that it provides “beds” instead of units, and that those beds are in shared rooms within shared apartments, the Lincoln40 project has discriminated against families, who are plainly unsuitable for such accommodations. For example, no family would allow a young child to be roommates with a college student from outside the family. To the extent the City expects this structure to provide relief under that or similar circumstances, that expectation is entirely unreasonable.

And third, the Davis Live project, on tonight’s agenda, will again expressly limit affordability to students. Davis Live proposes to build a 71-unit, 440-bed student housing development, of which 157 bedrooms would be designated double occupancy. Davis Live proposes that 53 beds—or only 12%—of the total beds would be designated affordable, which is insufficient to meet the City’s affordable ordinance. And again, the applicant’s affordable plan expressly limits the affordable housing to students only.

Thus, in total, the City has approved or is considering the approval of three large-scale residential developments where all 454 affordable beds are being restricted to students. This constitutes a pattern and practice of discriminating against low-income Davis families and workers, and a lost opportunity to equitably provide affordable housing to all Davis residents.

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2 http://documents.cityofdavis.org/Media/CityCouncil/Documents/PDF/CDD/Planning/Project-Applications/Lincoln40/Lincoln40-Approval-Documents/05F-Second-Reading-Lincoln40-DA-Ordinance.pdf.

II. The City’s Practice Violates State Law and Interferes with State Policies

California state law on affordable housing requires housing be provided equally to all state residents. For example, the Legislature has clearly provided that “[t]he availability of housing is of vital statewide importance, and the early attainment of decent housing and a suitable living environment for every Californian, including farmworkers, is a priority of the highest order.” (Gov. Code, § 65580, subd. (a) [emphasis added].) The responsibility for implementation has been assigned to both “[l]ocal and state governments [who] have a responsibility to use the powers vested in them to facilitate the improvement and development of housing to make adequate provision for the housing needs of all economic segments of the community.” (Id., subd. (d).) In cities such as Davis, where the vacancy rate is near zero, and the cost of residential housing is extremely high, the evenhanded distribution of affordable housing is even more critical to achieving state goals, as the pressures on low-income families to find housing in their community is even greater. These Davis families already compete with students in the housing market, and by limiting affordable housing to students only, the City is obstructing achievement of state goals and policies.

This obstruction also violates state anti-discrimination law. For instance, the Fair Employment and Housing Act prohibits discrimination in all aspects of housing (such as rental, lease, terms and conditions, etc.) based on the presence of children. Government Code section 12955, subdivision (a) provides in pertinent part that it is unlawful “[f]or the owner of any housing accommodation to discriminate against or harass any person because of . . . familial status . . . of that person.” Further, it is unlawful “[f]or the owner of any housing accommodation to make or to cause to be made any written or oral inquiry concerning the . . . familial status . . . of any person seeking to purchase, rent, or lease any housing accommodation.” (Id., subd. (b).) Familial status is defined as having one or more individuals under 18 years of age who reside with a parent or with another person with care and legal custody of that individual (including foster parents) or with a designee of that parent or other person with legal custody. Therefore, by restricting affordable housing to students only, by requesting information that would inform the developer of an applicant’s familial status, and by structuring the affordable plans in a way that prevents families from being able to use affordable “beds,” the City has violated state law, and will continue to do so if it approves the Davis Live affordable housing plan as currently proposed.

III. The City’s Practice Obstructs Regional Housing Goals

Recognizing the need to evaluate housing and growth in a regional context, state law has established a Regional Housing Needs Allocation (“RHNA”) process, which
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determines existing and projected housing needs during the planning period for each jurisdiction. (Gov. Code, §§ 65584 et seq.) Each city’s share of the regional housing needs is distributed among four income categories to ensure housing for all income levels. According to the adopted Regional Housing Needs Plan, Davis has allocated 1,066 units from 2013 through 2021, of which 248 (23.3%) are very-low income and 174 (16.3%) are low income. Through the implementation of Nishi, Lincoln40, and now Davis Live, and the affordable housing restrictions associated with those projects, the City is obstructing achievement of these regional requirements. For example, Government Code section 65584, subdivision (d) requires a “mix of housing types,” which would not be achieved by limiting all affordable housing to “beds” only. Further, these restrictions prejudice low-income households who are not students, and interfere with the City’s ability to satisfy its Regional Housing Needs Allocation. The City has not provided any explanation for how it can meet its regional allocations despite the student-only restrictions.

IV. The City’s Practice Is Contrary to the General Plan and Affordable Housing Ordinance

Finally, the City’s current practice of limiting the vast majority of all new affordable housing to students runs counter to its General Plan. For example:

- GOAL HOUSING 1. Promote an adequate supply of housing for people of all ages, income, lifestyles, and types of households consistent with General Plan policies and goals.
- Policy HOUSING 1.1. Encourage a variety of housing types that meet the housing needs of an economically and socially diverse Davis.
- Policy HOUSING 1.2. Strive to maintain an adequate supply of rental housing in Davis to meet the needs of all renters, including students.
- Policy HOUSING 1.3. Encourage the construction of housing to meet the needs of single persons and households with children with extremely low, very low, and low incomes.

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4 https://www.sacog.org/sites/main/files/file-attachments/adopted_sacog_rhnp_092012.pdf. It is worth noting that housing needs generated by the presence of a University of California campus, such as UC Davis, were incorporated into the methodology when producing these figures.
• Policy HOUSING 4.2. Provide housing opportunities for the local workforce in the Davis area.
• GOAL HOUSING 3. Increase equal housing opportunities for all persons and households in Davis. (Emphasis added.)

The student-only restrictions—especially when implemented on such a large scale, as is being done through Nishi, Lincoln40, and if approved Davis Live—are inconsistent with these General Plan policies and goals, since they prevent the variety of housing needed to meet the needs of all renters, including low-income households with children. This fundamental inconsistency prevents the City from approving the Davis Live project, as proposed, and should requires the City to reexamine its prior opinions with respect to Nishi and Lincoln40.

V. Conclusion

All in all, the City is devoting the bulk of its land and planning resources to developing large-scale projects that will benefit only a very narrow subset of its residents. For legal and policy reasons, the City must require that affordable housing be designed for all residents and be available to all qualifying residents—not just students.

Thank you for your consideration of these important issues.

Very truly yours,

SOLURI MESERVE
A Law Corporation

By:  

Patrick M. Soluri

PMS/mre

cc (via email only):

Matthew Wise, rmwise@gmail.com
Georgina Valencia, georginavalencia@sbcglobal.net
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Claire Goldstene, cgoldstene@yahoo.com
Ann Privateer, annprivateer@att.net
Bernita Toney, bdtony@yahoo.com
### Occurrence Report

**California Department of Fish and Wildlife**  
**California Natural Diversity Database**

<table>
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**Scientific Name:**  
*Buteo swainsoni*  
**Common Name:** Swainson's hawk

**Listing Status:**  
Federal: None  
State: Threatened

**Rare Plant Rank:**  
Rare

**Other Lists:**  
BLM_S-Sensitive  
IUCN_LC-Least Concern  
USFWS_BCC-Birds of Conservation Concern

**General Habitat:**  
BREEDS IN GRASSLANDS WITH SCATTERED TREES, JUNIPER-SAGE FLATS, RIPARIAN AREAS, SAVANNAHS, & AGRICULTURAL OR RANCH LANDS WITH GROVES OR LINES OF TREES.

**Micro Habitat:**  
REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.

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<td>PVT</td>
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<tr>
<td>Presence:</td>
<td>Presumed Extant</td>
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**Location:**  
JUST SOUTH OF DAVIS HIGH SCHOOL, IN A RESIDENTIAL AREA, DAVIS.

**Detailed Location:**  
MAPPED TO LOCATIONS GIVEN ON 1991 FIELD SURVEY FORM AND FOR TERRITORY YO146 IN CDFW SWAINSON'S HAWK OBSERVATIONS DATABASE: "JUST SOUTH" OR "0.25 MI SOUTH" OF DAVIS HIGH SCHOOL.

**Ecological:**  
NEST TREE IS LOCATED IN A RESIDENTIAL AREA; FORAGING AREA UNKNOWN.

**Threats:**  
General:

2 ADULTS OBSERVED NESTING IN 1991; NEST SUCCESS UNKNOWN. IN 1994, "URBAN CONIFER SITE" WAS INACTIVE.

**PLSS:**  
T08N, R02E, Sec. 09, NE (M)  
**Accuracy:**  
1/5 mile  
**Area (acres):**  
0

**UTM:**  
Zone-10 N4258130 E608850  
**Latitude/Longitude:**  
38.55494 / -121.75075  
**Elevation (feet):**  
45

**County Summary:**  
Yolo  
**Quad Summary:**  
Davis (3812158), Merritt (3812157)

**Sources:**  
DFG92U0001  
DFG94U0003  
EST91F0008  
ESTEP, J. - FIELD SURVEY FORM FOR BUTEO SWAINSONI (NEST SITE) 1991-XX-XX
## Occurrence Report

### California Department of Fish and Wildlife

**California Natural Diversity Database**

<table>
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<td>309</td>
<td>Occurrence Last Updated:</td>
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### Scientific Name: **Buteo swainsoni**

**Common Name:** Swainson's hawk

### Listing Status:

- **Federal:** None
- **State:** Threatened

### CNDDB Element Ranks:

- **Global:** G5
- **State:** S3

### General Habitat:

**BREEDS IN GRASSLANDS WITH SCATTERED TREES, JUNIPER-SAGE FLATS, RIPARIAN AREAS, SAVANNAHS, & AGRICULTURAL OR RANCH LANDS WITH GROVES OR LINES OF TREES.**

### Micro Habitat:

**REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.**

### Last Date Observed:

- 2006-05-11

### Last Survey Date:

- 2006-05-11

### Owner/Manager:

- PVT

### Presence:

- Presumed Extant

### Location:

**VICTINITY OF PRINCETON PLACE & NE CORNER OF K STREET AT E 8TH STREET IN DAVIS.**

### Detailed Location:

1998-1990: TERRITORY Y0081 FROM CDFW SWAINSON'S HAWK OBSERVATIONS DATABASE, MAPPED TO LOCATION DESCRIBED ON 1989/90 FIELD SURVEY FORMS. 2006: MAPPED TO COORDINATES FROM FIELD SURVEY FORM.

### Ecological:

1989 NEST IN NON-NATIVE PINE IN BACKYARD OF 1128 OR 1122 PRINCETON PLACE. 1990 PRESUMED NEST TREE WAS A TALL EUCALYPTUS. NESTING HABITAT WAS A SUBURBAN NEIGHBORHOOD.

### Threats:

MAIN THREAT/DISTURBANCE APPEARS TO BE HARRASSMENT FROM LOCAL JAYS, CROWS, AND MOCKINGBIRDS.

### General:

NEST AND 2 FLEGLINGS CONFIRMED IN 1989 IN THE VICINITY OF PRINCETON PLACE. 2 ADULTS AND 1 JUVENILE OBSERVED IN FLIGHT NEAR THEIR PRESUMED NEST IN 1990. 2 ADULTS OBSERVED NESTING ON 11 MAY 2006.

### PLSS:

- **T08N, R02E, Sec. 10, E (M):** Accuracy: 80 meters, Area (acres): 0

### UTM:

- **Zone-10 N4257953 E610155:** Latitude/Longitude: 38.55319 / -121.73581, Elevation (feet): 45

### County Summary:

- **Yolo**

### Quad Summary:

- **Davis (3812156)**

### Sources:

- HOS06F0001 HOSHOVSKY, M, (CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE) - FIELD SURVEY FORM FOR BUTEO SWAINSONI (NEST SITE) 2006-05-11
- SHA89F0001 SHAW, C, & M. HOSHOVSKY (CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE) - FIELD SURVEY FORM FOR BUTEO SWAINSONI 1989-06-XX
- SHA90F0001 SHAW, C. - FIELD SURVEY FORM FOR SWAINSON'S HAWK NEST SITE. 1990-XX-XX
PRELIMINARY ENDANGERMENT ASSESSMENT GUIDANCE MANUAL

(A guidance manual for evaluating hazardous substance release sites.)

State of California
Environmental Protection Agency
Department of Toxic Substances Control

January 1994
(Revised October 2015)
Foreword

The Preliminary Endangerment Assessment (PEA) Guidance Manual was significantly revised in October 2013. Comments were collected from interested parties for one year. This Final PEA Guidance Manual has been revised in response to those comments and to include changes in science and/or policy since 2013. In the future, DTSC intends to revise this manual on a yearly basis or as needed.

This version of the manual consists mostly of minor editorial revisions as recommended in comments submitted to DTSC in the past year. The more significant changes are:

- The inclusion of certain human-health-risk-based Environmental Screening Levels (ESLs) developed by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) as potentially acceptable screening levels in a PEA.

- The revision of the alternative simplified exposure equations to incorporate the latest U.S. Environmental Protection Agency (USEPA) exposure parameters as listed in the Office of Solid Waste and Emergency Response (OSWER) memorandum, dated February 6, 2014.

Comments and suggestions for improvement of the PEA Guidance Manual should be submitted to:

PEAManualComments@dtsc.ca.gov

This guidance describes currently technically defensible and consistent approaches for performing a PEA. This guidance is not a regulation and does not impose any requirements or obligations on the regulated community, but provides a suggested PEA framework.

Please Note: Links to non-Cal/EPA sites do not imply any official Cal/EPA or DTSC endorsements of or responsibility for the opinions, ideas, data, or products presented at those locations, or guarantee the validity of the information provided. Links to non-Cal/EPA servers are provided solely as a pointer to information on topics related to the PEA that may be useful to DTSC staff and the public.

Cover Photograph: Mono Lake, South Tufa Area, Mono County. Photo Courtesy of J. Michael Eichelberger
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ACRONYMS AND ABBREVIATIONS

AAI  All Appropriate Inquiries
AQMD  Air Quality Management District
ARAR  Applicable or Relevant and Appropriate Requirement
AT  Averaging Time
ATSDR  Agency for Toxic Substances and Disease Registry
BaP  Benzo(a)pyrene
BIOS  Biogeographic Information and Observation System
BTEX  Benzene, Toluene, Ethyl Benzene and Xylenes
Cal/EPA  California Environmental Protection Agency
CARB  California Air Resources Board
CCR  California Code of Regulations
CEQA  California Environmental Quality Act
CERCLA  Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS  Comprehensive Environmental Response, Compensation and Liability Information System
CFR  Code of Federal Regulations
CGI  Combustible Gas Indicator
CHHSL  California Human Health Screening Level
COPCs  Chemicals of Potential Concern
CSM  Conceptual Site Model
CUPA  Certified Unified Program Agencies
DFW  California Department of Fish and Wildlife (formerly California Department of Fish and Game (DFG))
DPH  California Department of Public Health
DOT  Department of Transportation
DTSC  Department of Toxic Substances Control
DQO  Data Quality Objective
DWR  California Department of Water Resources
ERNS  Emergency Response Notification System
ESL  Environmental Screening Levels
GC  Gas Chromatography
HASP  Health and Safety Plan
HEAST  Health Effects Assessment Summary Tables
HERO  Human and Ecological Risk Office
HHRA  Human Health Risk Assessment
HI  Hazard Index
HSC  Health and Safety Code
HWIS  Hazardous Waste Information System
IDW  Investigation Derived Waste
IRIS  Integrated Risk Information System
IUR  Inhalation Unit Risk
J&E  Johnson & Ettinger
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<td>LEL</td>
<td>Lower Explosive Limit</td>
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<tr>
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<td>Maximum Contaminant Level</td>
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<tr>
<td>mmHg</td>
<td>Millimeters of Mercury</td>
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<td>National Contingency Plan</td>
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<td>Naturally Occurring Asbestos</td>
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<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
</tr>
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<td>OEHHA</td>
<td>Office of Environmental Health Hazard Assessment</td>
</tr>
<tr>
<td>O&amp;M</td>
<td>Operation and Maintenance</td>
</tr>
<tr>
<td>OSHA</td>
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<td>OVA</td>
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<tr>
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<td>PCBs</td>
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<td>Polychlorinated Dibenzo-p-dioxins</td>
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<td>PCDF</td>
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<tr>
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<tr>
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<td>PID</td>
<td>Photoionization detector</td>
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<td>PLMve</td>
<td>Polarized Light Microscopy visual evaluation</td>
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<tr>
<td>PPB</td>
<td>Parts per billion</td>
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<td>Remedial Action Objective</td>
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<td>Reference Dose</td>
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<td>RSL</td>
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<tr>
<td>SF</td>
<td>Slope Factor (also Cancer Potency Factor)</td>
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<td>SFBWRQCB</td>
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<tr>
<td>SQL</td>
<td>Sample Quantification Limit</td>
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<td>Superfund Health Risk Technical Support Center</td>
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<td>2,3,7,8-tetrachloro-dibenzo-p-dioxin</td>
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<tr>
<td>TIC</td>
<td>Tentatively Identified Compound</td>
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<tr>
<td>TPH</td>
<td>Total Petroleum Hydrocarbons</td>
</tr>
<tr>
<td>TRI</td>
<td>Toxics Release Inventory</td>
</tr>
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<td>TSD</td>
<td>Treatment, Storage, and Disposal</td>
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<td>UCL</td>
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<td>USGS</td>
<td>United States Geological Service</td>
</tr>
<tr>
<td>VOC</td>
<td>Volatile Organic Compound</td>
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PREFACE

This document updates the Preliminary Endangerment Assessment Guidance Manual (1994, Second Printing, June 1999). The previous guidance should no longer be used; however, issuance of this new manual does not invalidate Preliminary Endangerment Assessments (PEAs) completed before (or in progress prior to) its release. This guidance manual differs from the 1994 version most significantly in the inclusion of:

- components of the All Appropriate Inquiries (AAI) process,
- simplification of human health screening risk evaluation, and
- addition of a methodology for evaluating human health risks from soil vapor intruding indoors.

The primary intended users of the manual are environmental consultants conducting PEAs for private parties with Department of Toxic Substances Control (DTSC) oversight. Because experience and professional judgment are vital for drawing the conclusions and presenting the recommendations requisite in the PEA, private parties are responsible for procuring the services of a competent Environmental Professional when preparing a PEA report. The manual should also be used by State Contractors and DTSC staff conducting PEAs with State funds. Other agencies or private entities requiring the use of the manual will be responsible for acting as lead agency and providing oversight for the project. Sites being evaluated as abandoned mine lands, should refer to the most current version of the Abandoned Mine Lands Preliminary Assessment Handbook. School districts, county offices of education and charter entities seeking state bond funding and who are required to prepare a PEA in accordance with Education Code §17078.54, subdivision (c)(1) (charter schools) or §17268 and §17213.1 (public schools) should discuss the contents of the PEA with the DTSC project manager assigned to their site to ensure that the document will satisfy all requirements.

The PEA incorporates much of the information required for completion of the preliminary assessment and site inspection (PA/SI) investigations currently used by the USEPA. The PEA also has background information requirements similar to a Phase I Environmental Site Assessment required by most lending institutions prior to commercial real estate transactions. An attempt has been made to include information required by the AAI Rule. Although overall PEA requirements are more comprehensive than requirements for the PA/SI and Phase I Assessments, the information gathered for the PEA may also be useful for those purposes, as well as address potential data gaps and address the “degree of obviousness of the presence or likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation” criterion as part of the AAI. Specific requirements of the PEA that are not typically required for these other types of investigations include the site-specific human health and ecological

---

screening evaluations, public participation requirements, data collection, and scoping activities.

The manual attempts to provide useful guidance for all possible site sizes and scenarios. This manual is not intended to be a "cook book" of mandatory ingredients required to produce a PEA report. A critical goal of scoping the PEA is to agree upon the focus of the PEA investigation and the degree to which each requirement in the manual applies to the subject site. Although each element of the PEA report should be addressed, the scope of the investigation and level of detail required for each section should be discussed with the DTSC project manager overseeing the PEA activities. Each section should be reviewed to determine the appropriate level of action for a given site; however, it is DTSC’s expectation that a PEA will be written as a stand-alone document. While other reports may be referenced if specific detail needs to be provided, information used as the basis for site conclusions needs to be included within the PEA.
ACKNOWLEDGEMENTS
The 2015 manual was prepared by the following DTSC staff:

Lynn Nakashima, Senior Hazardous Substances Scientist (co-author);
Kimiko Klein, Ph.D., Staff Toxicologist Emerita (co-author)
Members of the Geological Services Branch, Human and Ecological Risk Office, and
Ecological Risk Assessment Section.

The 1994 manual was developed by the following DTSC staff:
Megan Cambridge, (co-author);
Eric Garcia, (co-editor; co-author);
Elaine Stratton, (co-editor; co-author);
Technical services support staff and former Office of Scientific Affairs
CHAPTER ONE

INTRODUCTION

The Preliminary Endangerment Assessment (PEA) provides basic information for determining if there has been a release of a hazardous substance that presents a risk to human health or the environment. The PEA is a formal step in the Department of Toxic Substances Control’s (DTSC) cleanup program (While the program has been traditionally known as the site mitigation program, since incorporation of several additional components, the process will be referred to as the cleanup process or cleanup program to encompass the additional program elements). The PEA is intended to be the initial investigation of a site or property(ies) (hereinafter site also means property or properties) and is the first step in identifying whether a release or threatened release of a hazardous waste/substance/material has occurred, estimating the potential risk to public health and the environment, evaluating whether immediate response is needed to reduce the risk, and determining if further action/investigation is needed. In comparison, “All Appropriate Inquiries” (AAI) is the process of evaluating a property’s environmental conditions and assessing potential liability for any contamination. An AAI is conducted to obtain certain liability protections under the federal Superfund Law known as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The federal regulations for conducting All Appropriate Inquires can be found in 40 Code of Federal Regulations Part 312 (40 CFR 312).

1.1 ORGANIZATION OF THIS MANUAL

This guidance manual is organized into three chapters. Chapter 1 provides background information defining the PEA, explains how the PEA ties into the cleanup process and discusses DTSC’s responsibility to recover costs associated with oversight of the PEA. Chapter 2 provides technical guidance for conducting the PEA investigation, which includes scoping the project, acquiring background information, procedures for gathering reliable chemical and physical data, and methodologies for conducting the human health and ecological screening evaluations. Chapter 3 provides the suggested outline for presentation of the PEA investigation results in a PEA report. Chapter 3 also provides general guidance on how to organize the PEA report and a detailed description of information that should be included in the report.

1.2 DEFINITION/OBJECTIVES OF THE PEA

The PEA is defined in California Health and Safety Code (HSC), Division 20, Chapter 6.8, Section 25319.5 (HSC §25319.5) as follows:

Preliminary Endangerment Assessment means an activity which is performed to determine whether current or past waste management practices have resulted in the release or threatened release of hazardous substances 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.

- 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 identify data gaps and possible remedial action strategies that would form the basis for development of a site strategy.

- Providing the data and information to DTSC.

- Assessing and providing for the informational needs of the community.

1.3 THE PEA WITHIN THE CLEANUP PROCESS

DTSC’s cleanup process can be divided into several general phases: site evaluation, interim action, site characterization, remedial action, certification and operation and maintenance. The PEA is the initial investigation of the site and is completed during the site evaluation phase. Elements of the site evaluation phase are discussed in the following section. Figure 1-1 presents a flow chart of the site cleanup process. Detailed information regarding the entire cleanup process can be obtained by contacting one of DTSC’s regional offices or headquarters office.

The site evaluation phase of the cleanup process includes activities such as site discovery; site screenings; the PEA; and potentially responsible party searches.

Throughout the site evaluation phase, human and ecological risk-based assessments are conducted. The risk-based assessments begin as qualitative judgments that become progressively more quantitative as additional site specific information is collected and the conceptual site model (CSM) becomes more refined. As indicated in Figure 1-1, there may be circumstances when a PEA may not be initially conducted, and remedial investigation (RI) and quantitative risk assessment (RA) are performed instead.

At any time during or following the site evaluation phase, an interim action may be necessary. Interim actions are those actions taken to eliminate any immediate threats to public health or the environment resulting from conditions at the site. These actions generally include, but are not limited to, fencing the site, hot spot removals of contaminated areas, removing containers of hazardous substances/wastes, and/or
providing alternative water supplies. Interim actions should be identified and implemented as early as possible during the site evaluation process.

Site discovery, the first step of site evaluation, involves the identification of known or potentially contaminated properties that were previously unknown to DTSC. Following discovery, a site screening is conducted by DTSC staff to determine whether a property should be evaluated further and whether the property falls within the jurisdiction of DTSC’s cleanup authority. Based on the screening, one or more of the following recommendations will generally be made:

- No action required;
- Site referred to another agency;
- PEA required; and/or
- Interim action required.

The determination that a PEA is needed may occur after a property has been screened during the site discovery phase or a Project Proponent may voluntarily request DTSC to provide oversight of the preparation of a PEA. Typical scenarios for conducting the PEA include:

- DTSC identifies a property with a known or suspected release of hazardous substances/wastes/materials and contacts the Responsible Party(s) to initiate the investigation. The Responsible Party(s) either agrees to assess the site and enters into a Cleanup Agreement or DTSC issues an administrative order requiring the completion of the PEA with penalties for non-compliance.

- A Project Proponent, who voluntarily requests oversight from DTSC or a Regional Water Quality Board (RWQCB) to oversee completion of a PEA, submits an application to DTSC or a RWQCB initiating the Memorandum of Agreement (MOA) process. The California Environmental Protection Agency (Cal/EPA), DTSC, the State Water Resources Control Board and RWQCBs have signed a MOA regarding the regulatory oversight of brownfield sites. The purpose is to improve coordination between DTSC and the boards and the oversight of cleanup activities. The MOA was designed to accomplish several objectives including limiting oversight to only one agency and establishing procedures and guidelines to identify that agency. The MOA also designed a uniform site assessment procedure, defines the roles of support agencies, requires opportunity for public involvement, commits regulatory agencies to timeframes for review, and commits the agencies to coordinate and communicate on brownfield properties.

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2 The MOA process is more fully described on the SWRCB web page at: [http://www.swrcb.ca.gov/water_issues/programs/brownfields/docs/bfmoa.pdf](http://www.swrcb.ca.gov/water_issues/programs/brownfields/docs/bfmoa.pdf)

The application to request agency oversight is located on the DTSC web page at: [http://www.dtsc.ca.gov/SiteCleanup/Brownfields/BrownfieldsVoluntaryProgram.cfm](http://www.dtsc.ca.gov/SiteCleanup/Brownfields/BrownfieldsVoluntaryProgram.cfm)
• A site with a known or suspected release of hazardous substances/wastes/materials is identified, but the responsible person(s) have not been identified and potential or significant public health or environmental threats warrant use of DTSC’s resources to assess the site.

Figure 1-2 presents a diagram of the PEA process from the point of initiation with DTSC to preparation of the final report. As seen in the diagram, Initiate PEA, Background Research, Data Evaluation, and Report Preparation are steps required for all PEA investigations. The majority of the investigation’s flexibility lies within Public Participation, Sampling, and Human Health and Environmental Screening Evaluations. The requirements under these sections are dependent upon site-specific circumstances and DTSC staff should be consulted prior to proceeding. All of the sections in the diagram are flexible with regard to the level of effort required for each site.

The completed PEA report provides the information necessary to determine the need for further action at the site. DTSC staff will review the data in the PEA report to determine if the recommendations in the report are justified and supported. Sites requiring no further action will be released from DTSC oversight requirements. However, if information becomes available at a later date which indicates previously unknown or additional problems may exist, DTSC may initiate additional investigations at the site. Sites with significant contamination requiring further action will move along in the cleanup process for removal and/or remedial actions. In either case, DTSC will issue a letter formalizing completion of the PEA, approving or disputing the recommendations, and detailing any recommendations or requirements not presented in the PEA report that DTSC feels are necessary to address the site’s contamination.

DTSC approval of a "no further action (NFA)" recommendation signifies that DTSC’s concerns at the site have been addressed; however, a qualified NFA may be provided if other agencies require further action based on concerns not addressed during the PEA. For example, the RWQCB may require actions to remove an underground tank holding petroleum products. Whenever possible, the preparer and DTSC staff should coordinate with other agencies to address their concerns during the PEA.

Following completion of the PEA, a base-line potentially responsible party (PRP) search may be necessary to identify the principal parties potentially liable for mitigating contamination at the site. The most current version of US EPA’s PRP search Manual may be consulted to assist in the search\(^3\). The information required to complete the baseline PRP search should be contained in the PEA report. PRPs identified by the search may be required to participate in the work to be conducted beyond the PEA.

FIGURE 1-1 CLEANUP PROCESS

Oversight Agreement/Order

Corrective Action Consent Order or Facility-Initiated Corrective Action Agreement

Preliminary Endangerment Assessment (PEA)

Remedial Investigation (RI), Risk Assessment (RA), Feasibility Study (FS)

Facility Investigation (FI), Risk Assessment (RA), Corrective Measure Study (CMS) or CMP

Remedial Design (included in RAW)

Remedy Selection:

Interim Actions

Limited Additional Site Characterization

Removal Action Workplan (RAW) Remedial Action Plan (RAP)

Corrective Measures Proposal (CMP) and Final Remedy Selection

Remedial Design (included in RAW)

Implementation

Land Use Covenant (LUC) and O&M Plan/Agreement if required

Certification

Implementation of LUC and O&M Plan/Agreement, if required

No Further Action (NFA)

NFA with land use covenant decision

Text in italics indicates documents associated only with Corrective Action (HSC Chapter 6.5)
FIGURE 1-2 PRELIMINARY ENDANGERMENT ASSESSMENT PROCESS 
DIAGRAM

INITIATE PEA
• Formalize Agreement/Order
• Scoping Meeting

BACKGROUND RESEARCH
• Records Review
• Site Inspection
• Interviews

PUBLIC PARTICIPATION
• Develop Mailing List
• Work Notice
• Additional Activities as Required

DATA EVALUATION
• Accept/Reject Data
• Identify Data Gaps
• Compare to Background

SAMPLING
• Work Plan Preparation
• Work Plan Approval
• Sample Collection
• Additional Sampling Events as Required

HUMAN HEALTH SCREENING
• Establish Pathways
• Risk/Hazard Characterization
• Summation of Risk/Hazard
• Comparison to Screening Levels

ECOLOGICAL SCREENING
• Biological Characterization
• Pathway Assessment
• Qualitative Summary
• Comparison to Screening Levels

REPORT PREPARATION
• Draft Report
• Agency Review
• Final Report and Approval
1.4 COST RECOVERY

California law requires DTSC to recover all costs, including any accrued interest, incurred by DTSC associated with the investigation and cleanup of contaminated sites (HSC § 25360 and §25360.1). The final cost for oversight depends on the number of hours expended by DTSC staff. The Responsible Party(s) or Project Proponent(s) will be billed on a quarterly basis for costs incurred. Depending on the type of cleanup agreement, the Responsible Party(s) or Project Proponent(s) may be required to provide DTSC with an advance payment based on an estimate of the oversight costs.
CHAPTER TWO

THE PEA INVESTIGATION

Conducting a PEA investigation involves scoping the project, collecting and reviewing background information and chemical data, defining the community, and evaluating potential risks to public health and the environment. This chapter discusses methodologies for assessing the level of community interest in the site, identifies potential sources for locating information pertinent to the site investigation, provides procedures for acquiring reliable chemical data, and presents methodologies for completing screening level evaluations of human and ecological health risks related to site conditions.

If the PEA is being conducted as part of an All Appropriate Inquiries (AAI), the persons or businesses conducting the PEA will need to meet the standards and practices included in the U.S. Environmental Protection Agency's (USEPA) final rule dated November 1, 2006 as required under §101 (35) (B) (ii) and §101 (35)(B) (iii) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and 40 CFR Part 3124 or the most recent approved rule. This manual attempts to include those requirements, but the reader is advised to review the federal statute to ensure compliance with the regulatory requirements and standards for AAI. The AAI requires that completion of specific portions be conducted by an Environmental Professional having specific educational and experience requirements. With respect to the PEA, individuals conducting engineering and geological work must be in conformance with applicable state law including, but not limited to, Business and Professions Code § 6735 and §7835.

2.1 SCOPING

The Environmental Professional5 responsible for preparing the PEA has some flexibility regarding the focus of the PEA and the emphasis to be placed on each part of the investigation. Limits of this flexibility will be defined for each site by the DTSC project manager through the scoping process. The Environmental Professional and project manager should identify the scope of activities to be performed to ensure the activities are appropriate for site-specific conditions and objectives. Agreeing ahead of time to the scope of activities and remedial action objectives (RAOs) should aid in maximizing effective expenditure of time and money. The final report should document activities performed according to this manual and provide rationale for those PEA requirements not addressed.

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4 More information regarding US EPA’s All Appropriate Inquiries can be found on their Web page at: http://www.epa.gov/brownfields/aai/index.htm
5 The term Environmental Professional is used to describe the person who is preparing the PEA; however, geologic or engineering plans, specifications, drawings, and reports must be prepared by, or under the direct supervision of a California professional geologist or civil engineer, as appropriate, who will review and sign all such documents indicating responsibility for their content.
2.1.1 SCOPING MEETING

After signing an agreement or order, the first step in conducting the PEA investigation is to hold a scoping meeting between DTSC staff (e.g., geologist, toxicologist, occupational safety and health professional, project manager, etc.), the party required to complete the PEA and the Environmental Professional(s) assigned to do the work. The purpose of the meeting is to agree upon the approach for collecting information and develop a strategy for completing activities appropriate for the site in a safe manner. During the scoping meeting, plans should be made to identify:

- A schedule for activities;
- Roles and responsibilities;
- The amount of information previously collected and the need for background research and data collection;
- The desire to include “All Appropriate Inquiries” requirements within the PEA;
- Public participation needs; and
- The need for expedited response actions.

Additional meetings may be held throughout the investigation to review new information collected and/or update site strategy. The USEPA currently recommends the Triad approach to site investigation and cleanup. There are three components to Triad: systematic (or strategic) planning, dynamic work strategies, and real-time measurement systems. An agreement to use the Triad approach should be considered at the scoping meeting. For more information, go to the US EPA Triad Central website at www.triadcentral.org.

2.1.2 CONCEPTUAL SITE MODEL

The PEA uses the Conceptual Site Model (CSM) to develop a preliminary understanding of the site's potential risks to human health and the environment, and to assist in developing the sampling plan. The CSM presents information about site conditions and potential impacts to receptors, and may be updated as new information is obtained. The information can be provided in a schematic presentation as shown in Figure 2-1 or pictorially. The CSM should illustrate possible contaminant transport mechanisms and exposure pathways from various media that may be affected: air, soil, sediments, and water, including soil vapor, groundwater, and surface water. Information regarding the development of the CSM is available from a variety of sources including USEPA’s most current version of the RI/FS guidance document\(^6\), the Triad Resource Center\(^7\), and the

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\(^7\) Triad Resources Center Website: [http://www.triadcentral.org/](http://www.triadcentral.org/)

most current version of Appendix A of DTSC's *Remediation of Metals in Soil*\(^8\). The Triad approach has expanded the CSM to include past use, previous investigations, geology and hydrogeology, intended reuse, decision criteria, potential remedies, and exit strategies, and these elements may be included in the CSM for a PEA, if appropriate.

FIGURE 2-1 EXAMPLE OF CONCEPTUAL SITE MODEL RECEPTOR NETWORK

Primary Sources | Secondary Sources | Transport Mechanisms | Exposure Medium
--- | --- | --- | ---
Product Storage | Affected Soil | Airborne Particulate Matter | Soil
Piping & Distribution | Volatilize to Soil Gas | Air/Soil Vapor
Waste Management | Storm Water Runoff | Surface Water Body
USTs | Leaching/Migration to Groundwater | Affected Groundwater | Groundwater

Exposure Route | Receptor
--- | ---
Ingestion | Human | Site Workers | Terrestrial | Aquatic
--- | --- | --- | --- | ---
Residents | Site Workers | Terrestrial | Aquatic
--- | --- | --- | --- | ---
Inhalation | X | X | X
Dermal Contact | X | X | X

Ingestion
Inhalation | X | X | X
Dermal Contact
Ingestion
Inhalation
Dermal Contact | X | X | X

Ingestion | X | X
Inhalation | X | X
Dermal Contact | X | X
2.2 BACKGROUND RESEARCH

The purpose of the background research is to collect pertinent site information about the following:

- Site location, including legal description or easement;
- Regulatory status;
- Physical and environmental characteristics;
- Zoning, including any potential upcoming zoning or general plan changes;
- Current and past property uses and occupancies;
- Facility operations;
- Recorded environmental cleanup liens;
- Chain of title documents;
- Current and past corrective actions and response activities undertaken to address past and on-going releases of hazardous substances/wastes/materials;
- Engineering controls;
- Institutional controls;
- Current and past uses of hazardous substances/materials;
- Hazardous substance/waste/material management practices;
- Land use in the immediate area that might influence onsite conditions; and
- Environmental permits, both current and past, such as waste discharge requirements (WDR), National Pollution Discharge Elimination System (NPDES) permits, air quality management district permits, local permits, wastewater discharge permits, etc.

The Environmental Professional conducting the historical site search may exercise professional judgment as to how far back in time it is necessary to search historical records. Generally, the historical documents and records reviewed should cover a period of time as far back in the history of the property as it can be shown that the property contained structures or from the time the property was first used for residential, agricultural, commercial, industrial, or governmental purposes. At sites where information of past operations is limited, the type of operation known to have been conducted and any standard business or manufacturing practices applicable to operations of that kind and period should be researched. If there are data gaps in the information developed that
affects the ability of the person conducting the PEA to identify conditions indicative of releases or threatened releases, the Environmental Professional should identify the data gaps, identify the sources of information consulted to address the data gaps, and comment on the significance of the data gaps with regard to the ability to identify conditions indicative of releases or threatened releases on, at, in or to the property.

Complete and accurate site information is essential for determining the apparent problem, the potential exposure pathways and receptors, and the sampling needs for the PEA investigation. Records reviews, interviews, and site inspections should be conducted to complete this information-gathering phase of the PEA investigation. The specific information to be collected during these activities is outlined in Sections 3.2.3 Site Description, and 3.2.4 Background. The following sections provide guidance for completing these activities.

2.2.1 RECORDS REVIEW

This section provides potential data sources for the information requested to complete the background research for the PEA. Not all of the sources listed need be explored for each PEA. Reverse address and/or telephone directories, such as the Criss Cross Directory containing area-wide listings arranged by street address and phone number may be a useful resource. The review should begin with sources most likely to contain information on a given site. If conducting an AAI, searches and reviews for recorded environmental cleanup liens and reviews of government records must be conducted or updated within 180 days of and prior to the date of acquisition of the subject property.

1) **Agency Files:** The preparation of a complete history of onsite operations requires the review of all appropriate regulatory agency files. These files often provide documentation of releases and usually contain information not available in site records. If the information is not available on-line, then each agency should be contacted by telephone prior to making a visit to review files. Appointments are often necessary and fees may be charged for copying.

   a) **DTSC, Regional Office** for inspection results, permits, previous removal or cleanup activities. DTSC’s EnviroStor Data Base can also be reviewed on-line to obtain information on permitted facilities, environmental investigation and cleanup projects.


   c) **RWQCB** for waste discharge permits, National Pollutant Discharge Elimination System (NPDES) permits, previous cleanup activities, landfill or solid waste

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disposal lists and state leaking or registered underground storage tank lists. The State Water Resources Control Board GeoTracker \(^\text{10}\) data base is available online and includes information on leaking underground storage tank cleanup sites, land disposal sites, permitted underground storage tank facilities and other cleanup sites overseen by the State Water Board and RWQCBs. The Department of Resources Recycling and Recovery or the Local Enforcement Agency (LEA) may also have records concerning solid waste disposal.

d) **County and Local Offices** including Environmental Health Department; Planning Department; Building and Safety Department; Certified Unified Program Agencies (CUPA); Public Works Department; Public Health Offices, Air Pollution Control Districts; County Agriculture Commissioner's Office; County Tax Assessor's Office for all pertinent records regarding the site.

e) **Local Fire Department** for records regarding emergency response activities, hazardous materials storage at the site, and hazardous materials business plans.

f) **California Secretary of State's Office** for information regarding corporate ownership, officers, etc.

g) Public health records such as the Agency for Toxic Substances and Disease Registry (ATSDR) public health assessment and consultations.

h) **Department of Water Resources** (DWR) for well completion diagrams and well logs and information for wells installed on-site and in the vicinity of the site. Logs of monitoring wells used for environmental purposes may also be available.

i) **Division of Oil, Gas & Geothermal Resources** (DOGGR) is the repository for oil, gas, and geothermal well information and publishes statistics on drilling, production, and injection. General information, technical report, and statewide maps with locations and status of all oil, gas and geothermal wells are also available.

2) **Site Owner/Operator Records**: Facility records may be the primary source for information on hazardous substance/waste/material management practices at the site. Owner/operator files may include such records as product purchase invoices; waste manifests or bill of lading; permits; material safety data sheets; safety plans, preparedness and prevention plans; spill prevention, countermeasure and control (SPCC) plans; as-built drawings and/or schematics depicting construction details of waste handling/storage and/or industrial process areas, etc. that will provide valuable information regarding chemical usage and waste/material types, quantities, and treatment, storage and disposal practices.

3) **Professional Trade Organizations**: These organizations will have information on manufacturing processes and common industry practices.

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\(^{10}\) State Water Resources Control Board GeoTracker Database. [http://geotracker.waterboards.ca.gov/](http://geotracker.waterboards.ca.gov/)
4) **Maps and Photographs:** Maps, including electronic maps and photographs will be useful for establishing the physical setting of the site and identifying property uses at specified times.

   a) **USGS 7.5 Minute Topographic Maps** produced by the United States Geological Survey (USGS) provide a basis for establishing site location and topographic information.

   b) **Aerial photographs** of areas encompassing the site may allow for identification of historical development or site activities.

   c) **Photographs** may be available from private collections, libraries of local governments or colleges and universities, or historical societies that document historical site activities.

   d) **Fire Insurance Maps** produced by private fire insurance map companies indicate uses of properties at specified dates.

   e) **Sea Level rise inundation maps,** if applicable to site location.

Government records or databases should be reviewed for reported releases or threatened releases for nearby or adjoining properties. The record and database searches with their associated distances should include the following:

- NPL sites or tribal- and state-equivalent sites (one mile);
- State facilities subject to corrective action (one mile);
- Federally-registered, or state-permitted or registered, hazardous waste sites identified for investigation or remediation, such as sites enrolled in state and tribal voluntary cleanup programs and tribal-and state-listed Brownfields sites (one-half mile);
- Leaking underground storage tanks (one-half mile);
• Properties that previously were identified or regulated by a government entity due to environmental concerns at the property. Information that should be searched includes the following:
  • Delisted NPL sites (one-half mile);
  • Registries of publicly available lists of engineering controls (one-half mile);
  • Former CERCLIS sites with no further remedial action notices (one-half mile).
  • State small quantity and large quantity generators (adjoining properties);
  • Federally-permitted, tribal-permitted, or state-permitted (or registered) landfills and solid waste management facilities (one-half mile);
  • Registered storage tanks (adjoining properties); and
  • California Department of Fish and Wildlife (DFW) sites or other habitat areas where releases have occurred (one mile).

The search distance from the property boundary for reviewing government records or databases may be modified based upon the professional judgement of the Environmental Professional. The rational for the modification should be documented.

2.2.2 SITE INSPECTION

A site inspection is essential to document the physical setting of the site, verify information obtained from owner/operator and agency records, and/or obtain site specific information when no records are available. The site inspection should consist of a walk-through of known and potential exterior operations areas as well as the interiors of all structures. A visual inspection of areas where hazardous substances/materials may be or may have been used, stored, treated, handled, or disposed should be conducted. Quantities of hazardous substances/materials observed and potential releases should be documented. Box 2-1 contains examples of the specific physical features the observer should attempt to identify. Physical limitations to the on-site visual inspection should be noted.

In addition to the on-site inspection, a visual inspection of the adjoining properties is needed. This inspection may be conducted from the subject property line, public rights-of-way, or other vantage points (e.g., aerial photography), and include a visual inspection of areas where hazardous substances/materials may be or may have been stored, treated, handled or disposed. Observations of any locations where human or ecological receptors may exist and may be potentially affected by on-site contamination
moving off the property should also be noted. Any physical limitations related to the inspection of the adjacent properties should be noted.

Visual inspections of the property and of adjoining properties must be conducted or updated within 180 days of and prior to the date of acquisition of the subject property if performing an AAI.

2.2.3 INTERVIEWS

Interviews with current or former property owners, operators, facility managers, employees, occupants and/or site neighbors (owners and/or occupants) are necessary to obtain information regarding uses and historical physical characteristics of the site. Often based upon personal experience, this information can provide greater insight as to how the facility may have operated or who may be gaining access to the site. These personal accounts may confirm information found in agency files and provide missing details about the site. In some cases the information obtained from interviews may differ or contradict that obtained from records reviews. In these instances additional research may be needed to determine which information is accurate. Notes taken during interviews may be used as reference documents.

Telephone interviews may also be conducted with State and local agencies to obtain information not readily available through file review, including drinking water supplies, well locations, population served, and aquifer information.

For AAIs, interviews with past and present owners, operators, and occupants must be conducted or updated within 180 days of and prior to the date of acquisition of the subject property.

2.3 PUBLIC PARTICIPATION

Public participation is an integral component of the cleanup process. DTSC's formal Public Participation Program establishes the mechanism for initiating and maintaining two-way communication between the community affected by a contaminated site and the regulatory agencies responsible for site investigation and cleanup. Public participation is essential at any site where chemicals in soils or groundwater may volatilize and intrude to indoor air. Solicitation of community concerns, suggestions, and comments throughout the cleanup process allows DTSC to make more informed decisions and reduces the potential for delays that might arise if the community objects to or does not understand an action or decision. It is DTSC's policy that public participation activities be initiated from the onset of a project and continues throughout the entire cleanup process. DTSC's current version of the Public Participation Policy and Procedures Manual 11, which describes public participation requirements and other activities during the investigation and cleanup of sites, and the current version of the Vapor Intrusion Public Participation Manual.

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Advisory\textsuperscript{12}, which discusses the public participation issues arising when indoor air may be contaminated by vapors coming from the sub-surface, are available on DTSC’s website.

During the PEA, development and distribution of a work notice describing field work may be necessary if the investigation is near a sensitive receptor or in a residential area. The mailing list should consist of known interested parties/agencies, contiguous property owners and occupants. If it becomes clear during the PEA that the site will require additional steps beyond the PEA phase, or if there is high community interest, the DTSC Public Participation Specialist should be contacted to determine if additional community outreach, (e.g., additional noticing at or near the site, etc.), is needed. If a Land Use Covenant may be implemented during the PEA phase as a final remedy, the DTSC Public Participation Specialist will prepare an abbreviated community profile, and develop a public notice and fact sheet announcing a public comment period for the remedy.

2.4 DATA COLLECTION AND EVALUATION

This section deals with collecting samples from the field and evaluating the quality of the data collected. The Environmental Professional conducting the PEA should meet with the DTSC project manager and technical support staff, as appropriate; to review background information collected and discuss the need for additional sampling and a sampling strategy for the site. The Environmental Professional should submit a proposed work plan to DTSC for review and approval. Upon approval, the samples are collected and analyzed, and the resulting data are evaluated by the Environmental Professional and submitted to DTSC for review. Once the sampling and quality objectives are met, the data are ready for use in the screening evaluation (Section 2.5) and preparation of the PEA report.

The scope and type of field sampling will vary depending upon the site history and the nature of the release of hazardous substances/materials. If sampling has been conducted in the past, the results and related information needs to be reported and evaluated as part of the PEA. Additional sampling activities may be needed as part of the PEA investigation unless prior sampling data are of sufficient quality and quantity to fulfill the PEA requirements and objectives. Past sampling activities conducted without DTSC oversight will need to be reviewed by a DTSC project manager to evaluate the adequacy of the data for use in the PEA investigation.

2.4.1 WORK PLAN PREPARATION

The work plan with an associated health and safety plan (HASP) should include all information necessary for implementing field work. A generic sampling plan table of contents is included as Table 2-1. DTSC has developed various Proven Technologies

and Remedies Documents\textsuperscript{13} that contain generic field sampling plans that the
Environmental Professional may wish to review and use if appropriate when preparing the
PEA work plan. The following points should be addressed in the sampling plan:

1) \textbf{Introduction, Site Background, and Description:} Provide the scope and purpose
of the work plan, a history and site description relevant to sampling which identifies
past activities that may have resulted in the contamination and the location and
possible extent of the original release(s). The plan should also include other relevant
site information such as site location, topography, hydrology, climate conditions and
past sampling information. Maps should be presented that show the site in relation to
its surroundings and identify site-specific features. The plan should also include a
map(s) dedicated to identifying all sampling points, contamination sources, surface
water and general groundwater flow directions, and site boundaries.

2) \textbf{CSM and Data Quality Objectives (DQOs) Process:} Provide a description of the
CSM in text and/or figures. Identify the type, quality, and quantity of data that are
needed and the intended use of the data based on the CSM and through the DQO
process. More information on the DQO process can be found at the USEPA’s Triad
website and various USEPA quality assurance and quality control documents.

3) \textbf{Rationale for Sampling Strategy:} As part of the DQO process, provide the reason
for choosing the locations, depths, types of sample matrices, number of samples
(including quality assurance/quality control samples), analytical parameters, such as
target analytes, detection limits and field screening methods. Any statistical approach
used to select the locations should be explained.

4) \textbf{Sampling Methods:} Include step-by-step procedures and/or standard operating
procedures describing how each sample will be collected for each matrix type and
sampling technique. Any special methods to prevent losses of volatile or unstable
compounds, such as, USEPA Method 5035 for collecting soil samples for volatile
compound analysis, should be described. All equipment used to obtain samples and
number and type of field quality controls should be identified.

5) \textbf{Sample Containers and Preservation:} Show analytical methods, types and volume
of containers and preservation methods to be used for the different matrices in a table.
Describe the type of pre-cleaning method used for the containers or provide a
reference.

6) \textbf{Sample Packaging and Shipment:} Describe the methods for packaging, labeling,
marking and shipping the samples.

7) \textbf{Sample Documentation:} Provide a description of the sample label with an example.
A unique numbering system that positively identifies each sample and does not

\textsuperscript{13} Proven Technologies & Remedies Documents resources page. DTSC Web site.
http://www.dtsc.ca.gov/SiteCleanup/PTandR.cfm
distinguish the quality assurance and quality control (QA/QC) samples from other samples should be described.

8) **Record Keeping:** Discuss field documentation including field logs (log book, drilling logs etc.), photographs, and quality control checklist or logs, and chain of custody forms and seals. The specific types of entries to be made in the various logs should be stated.
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2.4.2 SAMPLING STRATEGY

The first objective of sampling during the PEA is to provide analytical data of known quality to identify the contaminants at the site. These data are used in the PEA screening evaluation to estimate the risk to public health and the environment. The highest concentrations of each contaminant detected onsite should be used to estimate the site's potential threat. The sampling strategy should ensure that locations which would likely contain the highest contaminant concentrations will be sampled.

The second objective of sampling is to determine the general extent of contamination in order to assess immediate potential threats, scope of removal and remediation needs. Sufficient information should be gathered from the sampling to determine: 1) the need for expedited response actions such as restricting site access; and 2) the areas of the site with highest levels of contamination.

The degree to which the sampling strategy includes surface soils, subsurface soils, groundwater, surface water, soil vapor, and air is based on past chemical handling practices, available analytical data, suspected contamination sources, probable migration routes, and potential exposure pathways identified in the CSM (Section 2.1.2). Expectations regarding the extent of the investigation should be discussed with the DTSC project manager. Overall, the investigation should be performed in a manner that will determine the nature of the contaminants, their general distribution in the environment, and their potential to migrate.

The goal of the sampling should be to gather sufficient data to complete a PEA. The sampling can occur in one event or can be addressed in a phased approach, depending on the information known prior to sampling and the specific goals of each investigation event. However, if it becomes apparent during the sampling phase that a field investigation beyond the scope of a PEA is needed, a meeting with the DTSC project manager should be held to determine whether the site should progress into the next steps of the cleanup process. In that case, the PEA is concluded with a recommendation for further investigation and/or remediation.

Sites with little known and suspected contamination may require only one sampling event to gather sufficient information to address the objectives. A phased approach may be desired at sites with suspected contamination. In a phased approach, the first step may be to determine the nature and general extent of soil contamination prior to determining the need for a groundwater investigation, soil vapor sampling, surface water sampling and/or air monitoring. The Environmental Professional and DTSC staff should explore the most cost-effective approaches to collecting the required information while maintaining the scientific integrity of the investigation.

Geologic or engineering plans, specifications, drawings, and reports must be prepared by, or under the direct supervision of a California-licensed professional geologist or civil engineer, as appropriate, who will review and sign all such documents indicating responsibility for their content.
2.4.2.1 SOIL SAMPLING (VADOSE ZONE)

The primary strategies used during the PEA to determine soil sampling locations are authoritative and systematic random sampling. Authoritative or "biased" sampling can be used to detect the highest concentrations of each contaminant and the general extent of contamination at sites where potential release locations are known. In this strategy, the person collecting the samples selects the sampling locations and depths using personal judgment, generally in areas where the highest concentrations of contaminants are suspected. Systematic random sampling can be used to determine the location and general extent of contamination at sites where the area of release is not well known. Systematic random sampling involves the collection of samples at predetermined, regular intervals on a grid placed over an area potentially impacted by a release. See the most current version of Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (USEPA SW-84614) for more detail on sampling strategies. In either case, the selection of sample locations, number of samples collected, and sample depths need to meet the goals of the DQO process.

For PEA screening risk evaluations, surface soil sampling at zero to 6 inches below ground surface may be necessary, since exposure to contaminants in surface soil is a likely possibility. The depth of all soil sample data for use in the human and ecological risk evaluations should be specified in the DQO process. Surface and subsurface soil sampling should address the horizontal extent of contamination.

Sufficient subsurface soil samples should be collected to determine whether a release has occurred, to assess the vertical and horizontal extent of contamination, and to determine if there is a potential impact to groundwater. Or the PEA investigation should provide sufficient data showing that there are no potential impacts to soil or groundwater. The maximum depth of sampling will depend on the potential for migration of the contaminants through soil. Individual sample depths should be based on site-specific lithology. Continuously cored boreholes should be installed to the anticipated depth of sampling at suspected locations of contamination. The continuous cores should be logged and described, as recommended in the most current version of guidance on drilling, logging, and sampling published by DTSC15. Contacts between fine- and coarse-grained sedimentary units should be defined. Samples for analysis should be collected from fine-grained sediments occurring immediately adjacent to contacts with coarse-grained units. In the vadose zone (i.e. above the water table), fine-grained materials may act as avenues for contaminant migration and/or may retard or restrict the downward migration of contamination if it is moving by semi-saturated (or saturated) flow. Sampling locations should also be targeted at depths where information collected from direct reading instruments and physical observations indicate contamination may exist.

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The samples collected and analyzed for the PEA should be discrete samples at most sites. Composited sampling may not allow the identification of localized contaminated areas or ‘hot spots’ and is generally not recommended during the PEA. However, composite sampling or incremental sampling can be approved by DTSC in advance for specific purposes, if such sampling is appropriate for site conditions.

Soil matrix sample results should be reported on a dry weight basis, if they will be compared to screening values that assume dry weight concentrations, such as the USEPA Regional Screening Levels (RSLs) for non-VOCs.

### 2.4.2.2 SOIL VAPOR SAMPLING

DTSC has determined that, at sites where volatile organic compounds (VOCs) are suspected, soil vapor (or soil gas) sampling is the method of choice for evaluating inhalation exposure. Both soil vapor and soil matrix sampling are usually necessary for indicating the presence and general extent of VOC soil contamination, and the potential for groundwater contamination. See the most recent version of Cal/EPA’s *Active Soil Gas Investigation Advisory*\(^\text{16}\) for collection of soil gas and *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*\(^\text{17}\) for soil gas sampling directly under building foundations.

### 2.4.2.3 GROUNDWATER SAMPLING

The determination of whether groundwater sampling is necessary at the site, including construction of monitoring wells, should be based on the CSM, as discussed in Section 2.1.2. Groundwater sampling should be performed at the site if any of the following conditions exist:

- Previous sampling data indicate groundwater is contaminated;
- Historical operations at the site indicate a potential for groundwater contamination due to quantity and/or types of chemicals released and the permeability of onsite soils; or
- Soil and/or soil gas data indicate the potential for groundwater contamination.

Grab groundwater samples may be collected to determine whether groundwater is affected by site operations as a more time efficient and cost effective sampling strategy. However, relative gradient and flow measurements cannot be obtained without fixed elevation data. The need to install permanent groundwater monitoring wells and the number of wells needed should be discussed with the DTSC project manager. The purpose of monitoring wells is to determine whether groundwater is affected by migration of contaminants and to establish the direction of groundwater flow. In addition to


\(^{17}\) DTSC. 2011. *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance).* October. [http://www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm](http://www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm)
sampling for suspected contaminants, monitoring wells may also be sampled for water quality parameters and water levels to evaluate water surface fluctuations and obtain groundwater elevation data not biased by short term aberrations, seasonal fluctuations, or off-site intermittent well pumping. These measurements may be used to construct water surface contour maps, calculate gradients, and identify flow direction.

If it is decided that monitoring wells are needed, the design of monitoring wells should be based on the hydrogeology of the site and the types of contaminants that are present. The first wells installed at a site are usually screened across the water table, assuming that contaminants migrating from the site would be detected in the shallowest groundwater. If data from the initial wells indicate the need for more wells or the need for wells in deeper water-bearing zones, this may indicate that the investigation is exceeding the scope of the PEA and the DTSC project manager should be contacted to determine if the project should proceed into the next phases of the cleanup process. In that case, the PEA should be concluded with a recommendation for further investigation and/or remediation.

DTSC’s Site Cleanup web site should be consulted for the most current guidance manuals on groundwater investigations\(^\text{18}\); however, site-specific guidelines for the groundwater monitoring program should be developed in conjunction with DTSC staff.

If initial monitoring results exceed the groundwater screening values identified in the PEA work plan, the PEA is concluded with a recommendation for further investigation and/or remediation. If there is uncertainty about the sampling results, the DTSC project manager should be consulted to determine whether additional sampling as part of the PEA would be appropriate to resolve the issue.

2.4.2.4 SURFACE WATER SAMPLING

Surface water bodies that pass through or border the site and have a potential to be affected by the contamination may need to be sampled. Regulatory personnel capable of evaluating ecological risks should be consulted to determine if sampling is needed and to ensure that the proper sampling methods, locations and analytical methods are used. In general, water and sediment samples should be taken to determine the up-gradient and down-gradient concentrations of chemicals. The methods used to collect sediment or water samples should be based on the type of contaminants, type of water body, flow rate and other physical features. Sediment samples should be collected from locations where the potential exists for insoluble or slightly soluble contaminants to settle. Samples should be collected from various locations along the runoff course that leads from the contamination to the water body; at the point where the runoff course enters the water body; up-gradient from that point; and down-gradient from that point. This sampling may be delayed and incorporated into future sampling events if the PEA recommends that further assessment is required, and the DTSC project manager agrees to delay the sampling.

General guidance on surface water sampling is available from the USEPA, the Surface Water Ambient Monitoring Program (SWAMP) of the California State Water Resources Control Board (SWRCB), and the USGS National Water Quality Assessment Program (NAWQA) Protocol for Collecting and Processing Stream Water Samples.\(^{19}\)

### 2.4.2.5 INDOOR AIR SAMPLING

The PEA determines the risk from VOCs via the inhalation pathway by using the maximum contaminant concentrations in soil vapor to estimate potential concentrations in indoor air. This approach is described in Section 2.5.4.5.3. Occasionally, indoor air sampling may be done within the context of a PEA to determine, for example, if evacuation is warranted. Indications that evacuation should be considered include: the presence of odors, physiological effects, wet basements, and/or flammable or explosive conditions. Outdoor or ambient air monitoring data are not necessary for use in a PEA screening risk evaluation, as VOC levels in outdoor air emanating from a site would be quite low because of dilution with atmospheric air compared to estimated VOC levels in a confined indoor air space. However, outdoor air monitoring can provide a synoptic estimation of air concentrations, and therefore may be useful for worker health and safety monitoring, or monitoring during removal actions with adequate background air monitoring.

Guidance on indoor air sampling and evaluating the intrusion of soil vapors into indoor air, including evaluation for acute hazards within an existing building is available in the most current version of DTSC’s *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance)*\(^{20}\)

### 2.4.2.6 BACKGROUND SAMPLING

Background samples are collected to distinguish between site-related contamination and naturally occurring or anthropogenic contaminant levels. In general, the use of regional background levels for comparison to site contamination is not acceptable. Background samples should be collected for each medium (e.g. water, soil or air) being investigated at or near the site but not in areas likely to be influenced by the contamination and/or facility operations (past or present). Background samples should be collected from locations that are upgradient/upstream of the suspected contamination. It may be difficult to obtain true background samples in highly urban, industrialized areas because of commingled plumes, etc. In such cases, consultation with DTSC staff may be necessary.

Background samples should be analyzed for naturally occurring chemicals. With few exceptions, background levels for manmade chemicals are zero. The few exceptions

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may arise when an off-site source has contributed to the onsite contamination, the site is part of a regional contamination problem, or the site-related contaminants are the same as certain ubiquitous, manmade chemicals, such as dioxins/furans and polycyclic aromatic hydrocarbons (PAHs).

It is unlikely that a sufficient number of background samples will be collected during the PEA investigation to be considered statistically valid. However, the information is useful in comparing relative ranges of background results to onsite contamination. If chemicals of potential concern (COPCs) include metals that are also naturally occurring in soil, background samples should be collected from a minimum of ten locations to determine the average contaminant concentration that is not a result of releases from the site. Background samples at each location should be collected from strata similar to onsite samples to which they will be compared. If initial sampling reveals a high variability between levels in each sample, more samples should be collected to increase the confidence in the average.

More information on background soil sampling is provided in the most current versions of Appendix B – Strategies for Establishing and Using Background estimates of Metals in Soil in DTSC’s Proven Technologies and Remedies Guidance – Remediation of Metals in Soil21, DTSC’s Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments at Hazardous Waste Sites and Permitted Facilities22 and DTSC’s Final Report Background Metals at Los Angeles Unified School Sites – Arsenic23.

2.4.3 QUALITY ASSURANCE AND QUALITY CONTROL MEASURES

The sampling strategy for the site should include quality assurance and quality control (QA/QC) measures to be implemented as part of the sampling and analytical procedures. The purpose of these measures is to produce data of a known quality. These QA/QC measures are established to monitor both field and laboratory procedures. QA/QC procedures specifically for the collection of soil gas can be found in the most current version of the Advisory - Active Soil Gas Investigation24 (Cal/EPA, 2015).

To check the precision and accuracy of field data, QA/QC samples should be collected for analysis. Field QC samples consist primarily of co-located samples, split replicates, travel blanks, equipment blanks, and field blanks. Field QC and site samples should be collected, stored, transported, and analyzed in the same manner. Table 2-2 provides the


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minimum field QA/QC sample requirements for each medium. Samples for QA/QC purposes should be collected from areas not likely to be highly contaminated.

In addition to samples listed in Table 2-2, QA/QC measures can be employed throughout the sample collection to improve the quality of the results. When selecting devices to collect, store, preserve, and transport the samples, consider the effect the device may have on the integrity of the samples. The devices should not alter the samples so as to be reactive, promote adsorption, leach analytes, or otherwise influence contaminant concentrations prior to analysis. Sample collection should also be performed in a manner that does not adversely affect the sample integrity. The collected samples need to be representative of existing site conditions, and influences due to the sampling and analysis procedures should be minimized. In order to evaluate any potential influences, persons conducting the sampling should document the manner in which samples are handled from the time of collection until final analysis using chain of custody procedures.

The State Certified laboratory performing the analysis should have its own internal QA/QC procedures. They include method blanks, surrogates, matrix spike and matrix spike duplicates, laboratory duplicates and initial and continuing calibration checks. These procedures will more than likely vary between laboratories.

**TABLE 2-2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES**

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-located replicates</td>
<td>5% of total # of samples</td>
</tr>
<tr>
<td>Split replicates</td>
<td>5% of total # of samples</td>
</tr>
<tr>
<td>Travel blanks</td>
<td>1 per sample shipment (volatiles)</td>
</tr>
<tr>
<td>Equipment blanks</td>
<td>1 per field decontamination event (as needed)</td>
</tr>
<tr>
<td>Field blanks</td>
<td>1 per sampling day</td>
</tr>
</tbody>
</table>

A current list of State Certified laboratories is available from the Department of Public Health’s Environmental Laboratory Accreditation Program web site.

2.4.4 ADDITIONAL REGULATORY REQUIREMENTS

DTSC will provide oversight for the preparation and implementation of the majority of the work required to complete the PEA. However, in doing so, DTSC does not relieve the responsible person(s) from liability for compliance with all other applicable laws and regulations. The PEA must be conducted in compliance with all applicable Federal, State and local requirements including, but not limited to requirements to obtain permits and to ensure worker safety.

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Some examples of other regulatory requirements whose applicability should be investigated prior to initiation of PEA sampling activities include:

- County or local oversight program (LOP) agency requirements for drilling permits for installation and destruction of borings and wells. The drilling must be conducted by a C-57 licensed driller, and Well Completion Reports signed by the driller must be submitted to the Department of Water Resources (DWR) for each boring; other specific county or LOP reporting requirements may apply.

- Department of Transportation (DOT) requirements for transporting hazardous materials; and requirements set forth in Title 22, California Administrative Code, for manifesting and transporting hazardous waste generated by the investigation;

- Air Pollution Control District permit requirements for air emissions (e.g. from stockpiles of soils contaminated with volatile chemicals and for emissions during excavation);

- RWQCB and local agency requirements for protection of stormwater, surface water and ground water quality;

- Occupational Safety and Health Administration (OSHA) requirements for worker safety (29 CFR §1910.120 and 8 CCR §5192). The site health and safety plan should be provided to DTSC prior to the start of field work;

- Land disposal restrictions for wastes/contaminated soils transported for disposal;

- California Department of Fish & Wildlife (DFW) requirements for identification and management of threatened or endangered species and habitats.

- Local requirements for noise, dust control, and vehicular ingress/egress from properties under investigation;

- Permits to perform intrusive investigation into public easements and right-of-ways; and,

- Underground Service Alert (USA) for on-site locations of pipelines, utilities²⁶

### 2.4.5 DATA EVALUATION

The PEA investigation usually requires the collection of a variety of data for a number of different purposes. Data collected can range from field monitoring data for health and

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safety precautions to laboratory analyses measuring contaminant levels. Each sample collected may have been analyzed for a number of different chemicals, depending upon the rationale for the sample. However, not all of the chemicals detected will be attributable to an onsite release and not all of the data are guaranteed to be of an acceptable quality. The purpose of the data evaluation is to determine which of the chemicals identified are likely to be site-related and to assess whether the reported concentrations for these chemicals are of acceptable quality for use in the screening evaluation. Much of the information in the following sections was excerpted from USEPA’s *Risk Assessment Guidance for Superfund, Volume 1 Human Health Evaluation Manual (Part A)*

### 2.4.5.1 EVALUATION OF ANALYTICAL METHODS

Not all of the data collected during the field investigation are appropriate for use in the screening evaluation. Analytical results that are not specific for a particular compound or results of insensitive analytical methods (e.g., portable field instruments) generally are not appropriate for screening risk evaluation. Table 2-3 provides examples of the types of analytical techniques and data that could potentially be unsuitable for use in the screening evaluation. However, these types of results may be useful when considering sources of contamination, potential fate and transport of contaminants, or qualitative discussions of risk. In addition, the results of analytical methods associated with unknown, few, or no QA/QC procedures should be eliminated from further quantitative use.

#### TABLE 2-3 EXAMPLES OF POTENTIALLY UNSUITABLE ANALYTICAL TECHNIQUES

<table>
<thead>
<tr>
<th>Analytical Instrument or Method</th>
<th>Purpose of Analysis</th>
<th>Analytical Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photoionization Detector (PID)</td>
<td>Health and Safety, Field Screen</td>
<td>Ionizable Organic Vapor</td>
</tr>
<tr>
<td>Organic Vapor Analyzer (OVA)</td>
<td>Health and Safety, Field Screen</td>
<td>Total Organic Vapor</td>
</tr>
<tr>
<td>Combustible Gas Indicator with O(_2) meter (CGI)</td>
<td>Health and Safety</td>
<td>Combustible Vapors, Oxygen-deficient Atmosphere</td>
</tr>
<tr>
<td>Field Gas Chromatography (GC)</td>
<td>Field Screen/Analytical Method</td>
<td>Specific Volatile and Semi-volatile Organic Chemicals</td>
</tr>
</tbody>
</table>

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2.4.5.2 EVALUATION OF REPORTING LIMITS

Before eliminating chemicals because they are not detected, the following points should be considered:

- The reporting limit for a chemical may be greater than corresponding standards, criteria, or concentrations derived from toxicity reference values, such as, USEPA Regional Screening Levels (RSLs) or other applicable risk-based screening values agreed upon by the project manager and DTSC toxicologist. Therefore, the chemical may be present at levels greater than these corresponding reference concentrations, which may result in undetected risk.

- A particular reporting limit for a chemical may be significantly higher than positively detected values for that chemical in other samples in a data set.

After considering the above points and other reasons why contaminants may not have been detected, those chemicals that have not been detected in any medium may be eliminated. If information exists indicating that the chemicals are present, they should not be eliminated. For example, if chemicals with similar fate and transport characteristics are detected frequently in soil, and some of these chemicals are also detected frequently in groundwater while the others are not detected, then the undetected chemicals are probably present in the groundwater and additional sampling should be conducted to attempt to confirm their presence. The PEA report can identify the possibility of undetected contaminants and recommend the additional sampling for the contaminants as part of the RI/FS.

2.4.5.3 EVALUATION OF QUALIFIED DATA

For analytical results, various qualifiers pertaining to the quality of the data are attached to certain data by either the laboratories conducting the analysis or by persons conducting the data evaluation. The data evaluation process will determine if each qualified data point should be flagged as rejected, or determine and document that qualified data are valid and useable.

2.4.5.4 EVALUATION OF BLANKS

Analysis of blank samples provides a way to determine whether contamination has been introduced into a sample set either (1) in the field while the samples were being collected or transported to the laboratory or (2) in the laboratory during sample preparation and analysis. To prevent the inclusion of non-site-related contaminants in the screening evaluation, the concentrations of chemicals detected in blanks should be compared with concentrations of the same chemicals detected in site samples. Detailed definitions of
different types of blanks are provided in Chapter 5 of the Risk Assessment Guidance for Superfund, Volume 1 Human Health Evaluation Manual (Part A)\textsuperscript{28}.

**Blanks containing common laboratory contaminants.** Acetone, 2-butanone (or methyl ethyl ketone), methylene chloride, toluene, and the phthalate esters are common laboratory contaminants\textsuperscript{29}. If the blank contains detectable levels of common laboratory contaminants, then the sample results should be considered positive only if the concentrations in the sample exceed ten times the maximum amount detected in any blank. If the concentration of a common laboratory contaminant is less than ten times the concentration detected in the blank, then it may be concluded that the chemical was not detected in the particular sample and the blank-related concentrations of the chemical may be considered to be the quantitation limit for the chemical in that sample. If all samples contain levels of a common laboratory contaminant that are less than ten times the level of contamination noted in the blank, then that chemical may be eliminated from the screening evaluation. However, the analysis results should still be presented in the report with an explanation.

**Blanks containing chemicals that are not common laboratory contaminants.** If the blank contains detectable levels of one or more organic or inorganic chemicals that are not considered by the USEPA to be common laboratory contaminants, then site sample results should be considered positive only if the concentration of the chemical in the site sample exceeds five times the maximum amount detected in any blank. Samples containing less than five times the amount in any blank should be treated as non-detects, and the blank-related chemical concentration should be considered the quantitation limit for the chemical in that sample. Again, if all samples contain levels of a chemical that are less than five times the level of contamination noted in the blank, then that chemical may be eliminated from the screening evaluation. The analysis results should still be presented in the report with an explanation.

**2.4.5.5 EVALUATION OF TENTATIVELY IDENTIFIED COMPOUNDS**

A tentatively identified compound (TIC) is a compound that can be seen by the analytical testing method, but its identity and concentration cannot be confirmed without further analytical investigation. The laboratory should report tentatively identified compounds (TICs). Two options for addressing TICs exist, depending on the relative number of TICs compared to non-TICs. When only a few TICs are present and there is no historical or site information suggesting that a particular TIC may be present, TICs may be excluded from a risk evaluation upon approval from DTSC. When many TICs are present, TIC concentrations appear elevated, or site information indicates that the TICs are present, further evaluation of TICs is necessary. A discussion of TICs is provided in


\textsuperscript{29} Ibid.
2.4.5.6 COMPARISON OF SITE DATA WITH BACKGROUND

A comparison of site concentrations with background concentrations is useful for identifying the non-site-related chemicals that are found at or near the site. Metals present at levels equivalent to background can be eliminated as chemicals of potential concern (COPCs) and need not be considered in the screening evaluation; however, metals whose concentrations are above background should be included. Under no circumstances should background concentrations be subtracted from concentrations observed at the site. If background risk might be a concern, it should be calculated separately from site-related risk. The comparison process is as follows:

- If the maximum site metal concentration is less than the maximum background, the metal can be excluded as a COPC.
- If the mean site metal concentration is equal to or less than the mean local background metal concentration, the metal can be excluded as a COPC. Before carrying out this step, refer to the listed resources on background data sets to make sure those data sets are adequate.
- The site metal data set should be compared to the background metal data set. If there is good overlap of the site and background data sets, the metal can be excluded as a COPC.

More detailed discussion on comparing site data to local background data is provided in the most current version of Appendix B – Strategies for Establishing and Using Background estimates of Metals in Soil in the Proven Technologies and Remedies Guidance – Remediation of Metals in Soil31.

2.4.5.7 IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN

All chemicals that are not eliminated by any of the above evaluations should be considered COPCs for the site and should be evaluated further through the PEA screening evaluation. The Environmental Professional should work closely with DTSC staff when evaluating data that are thought to be non-site-related. DTSC approval should be received before a chemical is eliminated from evaluation through the human health and ecological screening risk evaluation described in the following section.

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2.5 HUMAN HEALTH SCREENING RISK EVALUATION

The purpose of a human health screening risk evaluation is to estimate the potential chronic human health risk/hazard from soil and groundwater contamination at the site. This screening evaluation is intended to be a health-conservative preliminary evaluation of potential risk and hazard and, therefore, assumes that the site will be used for residential purposes, the scenario that would result in the greatest exposure and risk. This screening evaluation will assist the project manager, in consultation with the rest of the project team, in deciding whether further site characterization, risk assessment, or remediation is necessary. The recommendations presented in this section are intended only for a human health screening risk evaluation. DTSC’s Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note 4 provides additional guidance on carrying out a screening level human health risk evaluation and is updated as needed. Recommendations for performing a quantitative human health risk assessment are beyond the scope of this PEA Guidance Manual.

The basic screening risk approach is to calculate the estimated risk or hazard posed by the maximum concentration of a chemical detected in each medium (soil, water, air) using an established human health-risk-based residential screening level/concentration as a comparator, that is, the USEPA Regional Screening Level (RSL) for residential land use, modified as necessary by DTSC in HHRA Note 3. The basic screening risk equations for each medium (soil, water, air) are as follows.

For a carcinogenic chemical: The screening concentration is based on a target cancer risk of one-in-a-million ($10^{-6}$).

\[
\text{Maximum concentration} \times 10^{-6} = \text{Cancer Risk Screening concentration}
\]

For a non-carcinogenic chemical: The screening concentration is based on a target Hazard Quotient (HQ) of one.

\[
\text{Maximum concentration} = \text{Hazard Quotient Screening concentration}
\]

SOIL. Before using these RSLs or other risk-based generic screening levels agreed upon by the project manager and DTSC toxicologist, to conduct a human health screening risk evaluation, it is critical to examine the site-specific CSM to make sure that the exposure pathways and site conditions match those assumed in developing these RSLs. These generic screening concentrations are calculated by assuming exposure to soil via pathways most frequently encountered in a residential setting. Although health-

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33 USEPA Regional Screening Levels (Formerly PRGS) Web site. http://www.epa.gov/region9/superfund/prg/
34 DTSC Human Health Risk resources page contains HHRA Note 3. Web site http://www.dtsc.ca.gov/assessingrisk/humanrisk2.cfm#Guidance
conservative exposure input parameters are used, not all potential exposure pathways are included. For example, the ingestion of fruits and vegetables grown in backyard gardens located in contaminated soil or the inhalation of vapors from the sub-surface are not included as exposure pathways in the development of the RSLs. The sections below further discuss exposure pathways not included in RSLs.

**SOIL VAPOR.** The major exposure pathway for VOCs detected in soil vapor is the inhalation of vapors that have migrated indoors through diffusive and advective processes. In the absence of generic soil vapor screening levels, a method for performing a screening risk evaluation for VOCs detected in soil vapor is described in Section 2.5.4.5.3.

**GROUNDWATER.** The approach for the risk evaluation of chemical contaminants detected in groundwater assumes that groundwater may be used as a source of drinking water in a residential setting and compares the maximum groundwater concentration of a chemical to its tap water RSL. For constituents for which USEPA’s tap water RSLs (or alternate screening levels recommended by DTSC) are not available, California Public Health Goals (PHGs) may be used. Maximum Contaminant Levels (MCLs) should not be used in a screening risk evaluation, because they are not risk-based levels. However, since MCLs are commonly Applicable or Relevant and Appropriate Requirements (ARAR) in the cleanup program, they may be used as comparators as a potential requirement in a site cleanup.

If VOCs are detected in groundwater, groundwater should be further evaluated as a potential source of vapors that may intrude indoors with subsequent exposure by humans. Section 2.5.4.5.4 below describes an approach for calculating a screening risk from this pathway. The most current version of the *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance)* should be consulted for recommended approaches.

### 2.5.1 HUMAN HEALTH SCREENING LEVELS

Various suites of human health screening levels/concentrations are described below. If a chemical identified as a chemical of potential concern (COPC) does not have a screening level, the PEA preparer should consult with the DTSC project manager and toxicologist to decide if the equations shown in Section 2.5.4 – Alternative Simplified Exposure and Risk Equations, are appropriate for use in the PEA.

**Regional Screening Levels (RSLs).** USEPA RSLs are human-health-risk-based soil, air, or water concentrations developed by the USEPA for about 750 chemicals using toxicity criteria established or agreed upon by the USEPA and assuming residential land

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36 DTSC. 2011. *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance).* October. [http://www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm](http://www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm)

37 USEPA Regional Screening Levels (Formerly PRGS). Web site. [http://www.epa.gov/region9/superfund/prg/](http://www.epa.gov/region9/superfund/prg/)
and commercial/industrial land use. DTSC’s Human and Ecological Risk Office (HERO) reviews the USEPA RSL list periodically and releases their recommendations in a Human Health Risk Assessment (HHRA) Note 3. Both reference lists are updated periodically, and the most recent versions should be consulted when preparing a PEA. It is imperative that RSLs be used with modifications as discussed in DTSC HHRA Note 3 so that the screening levels utilized are those specifically recommended by DTSC. For a limited number of constituents, DTSC HHRA Note 3 recommends use of alternate screening levels, other than the RSLs.

The limitations of the RSLs are discussed as follows. 1) The inhalation of VOCs intruding indoors from the sub-surface is not included as an exposure pathway in the soil RSLs. Thus, soil RSLs for VOCs cannot be used in a PEA screening evaluation to evaluate the indoor air pathway. Soil RSLs for VOCs may be used to evaluate soil ingestion and outdoor ambient air exposures. Since the inhalation of vapors intruding into indoor air is not included in the development of the soil RSLs, this exposure pathway must be evaluated separately, as discussed in Section 2.5.4.5.3. 2) RSLs do not consider ecological receptors. 3) The derivation of soil RSLs does not consider the potential for contaminants to migrate to groundwater or surface water from soil. However, the RSL Tables do list risk-based and MCL-based screening levels in soil (SSLs), representing chemical concentrations in soil that may affect the groundwater through leaching. The DTSC geologist and the RWQCB should be consulted regarding the protection of groundwater and surface water.

Public Health Goals (PHGs). PHGs are human health-risk-based water concentrations developed by the OEHHA for more than 80 chemicals assuming the use of the water as tap water. The list of PHGs is available at OEHHA’s web site. However, USEPA tap water RSLs are suggested for use as screening concentrations in a PEA screening risk evaluation, unless otherwise recommended in the DTSC HHRA Note 3.

California Human Health Screening Levels (CHHSLs). CHHSLs are soil or soil vapor concentrations developed by the Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) for about 60 chemicals using toxicity criteria primarily established by the OEHHA. This list was originally published in 2005 and last revised in 2010. CHHSLs are no longer generally recommended for use in a human health risk evaluation, because they are not routinely reviewed and revised as new scientific information becomes available.

Environmental Screening Levels (ESLs). ESLs are suites of screening concentrations developed by the SFBRWQCB for surface water, groundwater, soil and soil gas with different specific objectives. Certain ESLs that have been calculated to be protective of human health in a residential setting may be acceptable for use in a PEA with the

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approval of a DTSC toxicologist, because these ESLs have been developed with the same methodology as used to derive the RSLs and use parameter values recommended by DTSC. These ESLs are: Table E-2 Soil Gas Screening Levels - Residential Exposure; Table E-3 Ambient and Indoor Air Screening Levels - Residential Exposure; and, Table K-1 Direct Exposure Soil Screening Levels, Residential Exposure Scenario. This recommendation that certain ESLs may be used in a PEA is dependent on the ESLs continuing to be updated on a regular basis.

However, soil ESLs calculated with the objectives of protection of terrestrial biota, against nuisance conditions, or against leaching to groundwater should not be used as health risk screening levels in a PEA because the models used to derive these levels have not been formally reviewed and accepted by DTSC. In addition, nuisance conditions are not considered a health risk issue, and protection against leaching to groundwater is not generally a component of a PEA. ESLs based on ecological concerns, such as surface water habitats, are not recommended for use in the qualitative ecological screening evaluation that is included in a PEA.

2.5.2 SCREENING EVALUATION ASSUMPTIONS AND EXPOSURE FACTORS

The parameters of the human health screening evaluation used to develop the USEPA RSLs are outlined in Section 2.5.2.1 below. These exposure parameters should be the same as those assumed for the site in a preliminary evaluation.

2.5.2.1 EXPOSURE PATHWAYS AND MEDIA OF EXPOSURE

The exposure pathways used to develop the RSLs are those recommended by the USEPA to represent a reasonable maximum exposure (RME) in a residential setting at Superfund sites.

SOIL. The exposure pathways included in the calculation of RSLs for soil are: incidental ingestion of soil, dermal absorption of nonvolatile chemicals in soil, and inhalation of airborne dust and volatile chemicals in ambient air.

GROUNDWATER. The exposure pathways included in the calculation of RSLs for water assumed to be used as tap water are: ingestion from drinking, dermal exposure, and inhalation of volatile chemicals generated during household use (e.g. showering, dish washing).

OTHER EXPOSURE PATHWAYS. Other exposure pathways are possible under a residential scenario at a particular site as described below. But for a screening evaluation in which RSLs will be used as direct comparators, the pathways listed above are the only pathways considered complete.

- The ingestion of fruits and vegetables grown in backyard gardens located in contaminated soil are not included as an exposure pathway in the development of the RSLs, so if food chain contamination is suspected or is plausible, then RSLs should
not be used in a screening level evaluation, and a DTSC toxicologist should be consulted.

- The inhalation of vapors intruding into indoor air **is not** included as an exposure pathway in the development of the soil RSLs. Therefore, the vapor intrusion to indoor air pathway must be evaluated separately, if VOCs have been detected in soil vapor.

- The tap water RSLs **do not** include vapor intrusion to indoor air of VOCs present in groundwater. Nor do they include ingestion of water during swimming, nor transfer of chemicals in water to aquatic organisms, like fish, with subsequent ingestion by humans. It is the responsibility of the Environmental Professional, in consultation with the project manager and DTSC toxicologist, to determine whether additional exposure pathways should be considered.

- Early life exposure **is not** included as an adjustment for exposure to carcinogens in a PEA for the following reasons. First, age-dependent adjustment factors have been included in the RSLs for those chemicals considered mutagens. Second, the other conservative assumptions included in the PEA screening evaluation should be adequately protective for all potentially exposed populations.

- Exposure pathways associated with specific cultural or traditional practices **are not** included in the development of RSLs. If such pathways are plausible, then a DTSC toxicologist should be consulted for the appropriate approach.

### 2.5.2.2 LAND USE

For purposes of a PEA screening evaluation, the land use of the site is assumed to be residential, regardless of the current use and zoning for the site. Residential land use is assumed, because the most health-conservative exposure parameters are folded into that assumption; thus, a no further action determination can be made if the screening evaluation indicates that the contaminants present pose an insignificant risk or hazard. However, the residential scenario would not necessarily be protective of unrestricted land use for those chemicals that bioaccumulate in food products (e.g., dioxins). The Environmental Professional should consult with the project manager and DTSC toxicologist, if bioaccumulative chemicals are present at the site.

Additional evaluations and actions are necessary to address land uses other than residential. Therefore, the DTSC project manager must approve the assumption of any alternative land use in a PEA screening evaluation, such as, commercial/industrial land use. Restriction of the site to commercial/industrial use will probably require a land use covenant.

### 2.5.2.3 CHEMICAL GROUPS

Certain chemical groups are beyond the scope of a PEA evaluation, since they require more complex toxicological evaluations or represent acute health risks. Examples are:
wastes/soils which have a pH less than or equal to 2.0 or greater than or equal to 12.5; medical wastes; reactive/explosive wastes (e.g., strong oxidizers/ munitions); asbestos and radioactive wastes. These wastes require other techniques of investigation and assessment.

The discussions below should be taken into account when considering a PEA evaluation of the following chemicals and chemical groups:

1) **Polycyclic Aromatic Hydrocarbons (PAHs):** PAHs are often present in ambient concentrations in urban area soils due to past industrial activities. Therefore, ambient levels of PAHs may be considered in a site evaluation, if agreed upon by the DTSC project manager and toxicologist. More information on ambient PAH concentrations may be found in the current version of Use of the Northern and Southern California Polynuclear Aromatic Hydrocarbon (PAH) Studies in the Manufactured Gas Plant Site Cleanup Process. Potentially carcinogenic PAHs detected in soil and listed in Table 2-4 below may be converted to benzo(a)pyrene (BaP) equivalent concentrations utilizing the most current US EPA equivalency factors shown in the table. The total BaP equivalent concentration would then be compared to the BaP RSL and ambient PAH levels. Naphthalene is also a carcinogenic PAH but is not included in Table 2-4. Risk from exposure to naphthalene is evaluated separately.

As of the release date of this guidance manual, the toxicity criteria for benzo(a)pyrene are under review. Therefore, a DTSC toxicologist should be consulted if PAHs are potential chemicals of concern at a site.

TABLE 2-4 POTENCY EQUIVALENCY FACTORS (PEF) FOR PAHs

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Equivalency Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>benzo(a)pyrene</td>
<td>1.0</td>
</tr>
<tr>
<td>benzo(a)anthracene</td>
<td>0.1</td>
</tr>
<tr>
<td>benzo(b)fluoranthene</td>
<td>0.1</td>
</tr>
<tr>
<td>benzo(k)fluoranthene</td>
<td>0.01</td>
</tr>
<tr>
<td>Chrysene</td>
<td>0.001</td>
</tr>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>1.0</td>
</tr>
<tr>
<td>indeno(1,2,3-c,d)pyrene</td>
<td>0.1</td>
</tr>
</tbody>
</table>

This table lists PEFs recommended by the USEPA and should be used in conjunction with the USEPA cancer toxicity criterion for B(a)P.

2) **Polychlorinated Biphenyls (PCBs):** Assume all PCBs analyzed as Aroclor mixtures are equivalent to Aroclor 1254 in cancer potency and noncancer toxicity.

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3) **Polychlorinated Dibenzo-p-dioxins, Dibenzofurans (PCDD/PCDF), and certain PCBs:** PCDDs and PCDFs are often present in ambient concentrations due to widespread air dispersion during the burning of chlorine containing compounds in incinerators, backyard trash fires, forest fires, etc. They are also contaminants of pentachlorophenols, other pesticides and sewage sludge. Consequently, ambient or background dioxin/furan concentrations may need to be considered at sites where dioxins/furans are potential site-related chemicals of concern. Assume unspeciated PCDD/PCDF are equivalent in cancer potency to 2,3,7,8-tetrachloro-dibenzo-p-dioxin (2,3,7,8-TCDD). However, if congeners have been speciated, use the Toxicity Equivalency Factor (TEQ) approach with the TEQs shown in Table 2-5 below\(^{43}\). Total Dioxin-TEQ concentrations would then be compared to the Dioxin RSL. The evaluation of an agricultural or animal grazing site contaminated with PCDD/PCDFs is beyond the scope of a PEA, and the appropriate evaluation of such sites should be discussed with the project manager and a DTSC toxicologist.

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### TABLE 2-5 TOXICITY EQUIVALENCY FACTORS FOR DIOXINS AND DIOXIN-LIKE COMPOUNDS

<table>
<thead>
<tr>
<th>Compound</th>
<th>WHO 2005 TEQ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chlorinated dibenzo-p-dioxins</strong></td>
<td></td>
</tr>
<tr>
<td>2,3,7,8-TCDD</td>
<td>1</td>
</tr>
<tr>
<td>1,2,3,7,8-PeCDD</td>
<td>1</td>
</tr>
<tr>
<td>1,2,3,4,7,8-HxCDD</td>
<td>0.1</td>
</tr>
<tr>
<td>1,2,3,6,7,8,-HxCDD</td>
<td>0.1</td>
</tr>
<tr>
<td>1,2,3,7,8,9-HxCDD</td>
<td>0.1</td>
</tr>
<tr>
<td>1,2,3,4,6,7,8-HpCDD</td>
<td>0.01</td>
</tr>
<tr>
<td>OCDD</td>
<td>0.0003</td>
</tr>
<tr>
<td><strong>Chlorinated dibenzofurans</strong></td>
<td></td>
</tr>
<tr>
<td>2,3,7,8-TCDF</td>
<td>0.1</td>
</tr>
<tr>
<td>1,2,3,7,8-PeCDF</td>
<td>0.03</td>
</tr>
<tr>
<td>2,3,4,7,8-PeCDF</td>
<td>0.3</td>
</tr>
<tr>
<td>1,2,3,4,7,8-HxCDF</td>
<td>0.1</td>
</tr>
<tr>
<td>1,2,3,6,7,8-HxCDF</td>
<td>0.1</td>
</tr>
<tr>
<td>1,2,3,7,8,9-HxCDF</td>
<td>0.1</td>
</tr>
<tr>
<td>2,3,4,6,7,8-HxCDF</td>
<td>0.1</td>
</tr>
<tr>
<td>1,2,3,4,6,7,8-HpCDF</td>
<td>0.01</td>
</tr>
<tr>
<td>1,2,3,6,7,8,9-HpCDF</td>
<td>0.01</td>
</tr>
<tr>
<td>OCDF</td>
<td>0.0003</td>
</tr>
<tr>
<td><strong>Non-ortho substituted PCBs</strong></td>
<td></td>
</tr>
<tr>
<td>PCB 77</td>
<td>0.0001</td>
</tr>
<tr>
<td>PCB 81</td>
<td>0.0003</td>
</tr>
<tr>
<td>PCB 126</td>
<td>0.1</td>
</tr>
<tr>
<td>PCB 169</td>
<td>0.03</td>
</tr>
<tr>
<td><strong>mono-ortho substituted PCBs</strong></td>
<td></td>
</tr>
<tr>
<td>105</td>
<td>0.00003</td>
</tr>
<tr>
<td>114</td>
<td>0.00003</td>
</tr>
<tr>
<td>118</td>
<td>0.00003</td>
</tr>
<tr>
<td>123</td>
<td>0.00003</td>
</tr>
<tr>
<td>156</td>
<td>0.00003</td>
</tr>
<tr>
<td>157</td>
<td>0.00003</td>
</tr>
<tr>
<td>167</td>
<td>0.00003</td>
</tr>
<tr>
<td>189</td>
<td>0.00003</td>
</tr>
</tbody>
</table>

4) **Chromium:** Assume total chromium is all hexavalent unless valid data on speciation are available. Hexavalent chromium is a known irritant that can cause allergic dermatitis in humans.

5) **Total Petroleum Hydrocarbons (TPH) - Petroleum-Related Compounds:** Complex mixtures of petroleum hydrocarbons are found in crude oils, petroleum products, and various wastes from refineries and petroleum-related facilities. At sites
with known or suspected releases of petroleum compounds to the environment all media that have potentially been impacted should be investigated. Soil samples should be analyzed for TPH and reported by the carbon range and, if possible, as aliphatic or aromatic compounds. Methods for TPH analysis should be chosen in consultation with DTSC staff. If the source of the petroleum hydrocarbons is unknown, then a full scan for organic analytes should be conducted to identify the presence of toxic constituents and their concentrations prior to conducting the screening evaluation.

The individual compounds and carbon ranges detected will vary according to the original composition of the petroleum product, the time elapsed since the release, and site conditions. TPH-related compounds with established toxicity criteria should be specifically analyzed for in soil, groundwater, and/or soil vapor, including: BTEX compounds (i.e., benzene, ethylbenzene, toluene, and xylenes), hexane, methyl tert-butyl ether (MTBE), 2-methylnaphthalene, PAHs, including naphthalene, metals listed in the California Code of Regulations Title 22, Section 66261.24, Table II (formerly called California Assessment Manual (CAM) metals), and, in some circumstances, dioxins and PCBs.

TPH may be evaluated using one of the following approaches upon approval from the DTSC team.

A) The 2015 USEPA RSLs list residential screening levels for TPH fractions, based on noncancer health effects, as follows, and may be used if aliphatic and aromatic fractions have been reported out separately:

<table>
<thead>
<tr>
<th>TPH Fraction</th>
<th>Carbon Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>low aliphatic</td>
<td>C5-C8</td>
</tr>
<tr>
<td>medium aliphatic</td>
<td>C9-C18</td>
</tr>
<tr>
<td>high aliphatic</td>
<td>C19-C32</td>
</tr>
<tr>
<td>low aromatic</td>
<td>C6-C8</td>
</tr>
<tr>
<td>medium aromatic</td>
<td>C9-C16</td>
</tr>
<tr>
<td>high aromatic</td>
<td>C17-C32</td>
</tr>
</tbody>
</table>

B) If the DQOs of the investigation are limited to reporting TPH as gasoline, diesel and motor oil, the 2013 SFBRQWCB residential health-risk-based ESLs may be used for screening purposes.

If the screening risk evaluation concludes that TPH at a site are not present at levels of concern for human health, TPH should be further evaluated for gross contamination, odor, nuisance, and potential to affect groundwater.

Locations and depths where soil vapor samples will be collected should be decided in consultation with the DTSC project team. Soil vapor sampling probes should be located close to source areas and within high-permeability soils. The necessity of soil
vapor sampling and use of models for evaluating TPH vapor intrusion should be discussed and agreed upon with DTSC staff. Vapor intrusion models that incorporate biodegradation are not appropriate for screening-level risk evaluation purposes.

If the PEA indicates that TPH-related compounds are the only major chemicals of potential concern, the DTSC project manager should be consulted to determine the most suitable environmental oversight agency for guidance in conducting an in-depth, site-specific evaluation.

Additional information on the evaluation of TPH in the environment may be found in the most current version of the State Water Resources Control Board’s *Low-Threat Underground Storage Tank Case Closure Policy*[^44], the TPH chapter in the most current *User’s Guide: Derivation and Application of Environmental Screening Levels*, published by the SFBRWQCB[^45], and the Massachusetts Department of Environmental Protection’s *Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of the MADEP VPH/EPH Approach*[^46]. Additional guidance on the evaluation of TPH at contaminated sites is forthcoming from DTSC.

6) **Metals:** For the purposes of this document, the term "metals" is taken to include true metals, such as cadmium and zinc; metalloid elements, such as arsenic and antimony; and selenium which is a nonmetal.

7) **Arsenic:** Arsenic is naturally present in soil at concentrations often greater than its risk-based screening level. Soil concentrations of arsenic may be elevated at a site because of past use or manufacture of arsenic-containing products, such as pesticides, wood preservatives, paints, dyes, electrical components and medical drugs, or as a contaminant in mine tailings. Site soil arsenic concentrations should first be compared to local background concentrations to determine whether further evaluation of this chemical is warranted, because naturally occurring background arsenic concentrations vary widely in different geographic regions. If further evaluation is necessary, it should be done in consultation with the DTSC project manager, geologist and toxicologist and may need to include the consideration of additional background data, bioavailability, end use of the property, and administrative controls. Detailed discussion on evaluating arsenic at a site is found in the most current version of DTSC’s *Arsenic Strategies*[^47].

8) **Inorganic Lead:** Lead is most often elevated at sites because of historical uses of leaded gasoline and lead-based paints. The Cal/EPA OEHHAA revised its toxicity evaluation of lead in 2007 by replacing the threshold blood lead concentration of 10 micrograms per deciliter (µg/dL) blood with a source-specific, benchmark change of one µg/dL for the protection of children. One µg/dL is the estimated incremental increase in the blood lead level in children that would reduce intelligence quotient (IQ) by up to one point. DTSC revised the Lead Risk Assessment spreadsheet (LeadSpread; Version 8, 2011) to reflect this change in approach. Using this spreadsheet, the recommended residential soil lead screening level is 80 mg/kg, as stated in the DTSC HHRA Note 3. For more information, see *User’s Guide to LeadSpread 8 and Recommendations for Evaluation of Lead Exposures in Adults*.

9) **Methane and Hydrogen Sulfide:** Methane and hydrogen sulfide can be naturally present in certain areas, such as old oil fields and marshlands, as well as a result of past manufacturing activities, such as petroleum extraction and refining, pulp and paper operations, and at waste disposal facilities, such as landfills and wastewater drying beds. Evaluation of methane and/or hydrogen sulfide should be included in the PEA work plan if they are suspected of being present at the site through the DQO process. More information on sampling for methane is contained in *Advisory - Active Soil Gas Investigations*. Methane is explosive between its Lower Explosive Limit (LEL) of 5% by volume and its Upper Explosive Limit (UEL) of 15% by volume. If potentially explosive gas levels are detected, an imminent and substantial danger may exist and a response action may be needed. In addition, methane can be a carrier gas for other volatile organic compounds in which case, the presence of methane may affect vapor intrusion assessments.

More information on methane investigations may be found in the most current *Advisory on Methane Assessment and Common Remedies at School Sites* and *Evaluation of Biogenic Methane, A Guidance Prepared for the Evaluation of Biogenic Methane in Constructed Fills and Dairy Sites*.

Hydrogen sulfide is a flammable, colorless, and toxic gas with a characteristic odor of rotten eggs. Humans are extremely sensitive to hydrogen sulfide odors and can smell such odors at concentrations as low as 0.5 to 1 part per billion by volume (ppbv) (0.70 to 1.39 micrograms per cubic meter (µg/m³)). At levels approaching 50

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48 More information can be found at LeadSpread 8 resources page. DTSC Web site. [http://www.dtsc.ca.gov/AssessingRisk/LeadSpread8.cfm](http://www.dtsc.ca.gov/AssessingRisk/LeadSpread8.cfm)


ppb (69.7µg/m³), the odor can be offensive\textsuperscript{52}. At high concentrations, a person may lose the ability to smell hydrogen sulfide. Hydrogen sulfide has a LEL of 4% and an UEL of 44%. The OEHHA Inhalation Reference Exposure Level (REL) for acute exposure is 42 µg/m³. The REL for chronic exposure is 10 µg/m³. If hydrogen sulfide is suspected to be present near or above these levels, handheld instruments should be employed at the site for screening purposes.

10) **Naturally Occurring Asbestos (NOA):** The PEA should consider whether NOA is present in surface or subsurface soils or rock at the site. Six regulated asbestos minerals belonging to two different mineral groups occur in California (i.e., serpentine and amphibole). NOA may be associated with specific rock types, faults or shear zones, geologic contacts, and zones of hydrothermal alteration. Asbestos minerals may also be present in soils or fill derived from asbestos-containing parent material.

If the presence of NOA is suspected, information sources such as site records and files regarding manufacturing and disposal activities, statewide asbestos maps, mineral sheets, USGS and California Geological Survey open file reports, and other studies should be reviewed. A site inspection should be conducted by a California professional geologist or engineer properly trained and experienced in the identification of NOA. Based on the information gathered, sampling to determine if NOA is present at the site may be needed. The sampling strategy and analytical methods should be included in the PEA work plan. All NOA samples should be analyzed using the California Air Resources Board (CARB) Polarized Light Microscopy (PLM) method with a detection limit of 0.25% or less (CARB 435 PLM). If NOA is detected at greater than or equal to 0.25% by PLM, the conclusion in the PEA should recommend further evaluation of the site.


11) **Radon and Radioactive Materials:** Radon is a naturally occurring, radioactive, noble gas that is odorless and tasteless. It is formed as part of three radioactive decay chains that begin with uranium or thorium. These elements are found in small amounts in most rock, soil, and water. If radon or radioactive material is suspected of being present at the site, the Environmental Professional should contact the California Department of Public Health (DPH) and the DTSC project manager to determine whether and how the site should be evaluated.

12) **VOCs and Trichloroethylene (TCE):** VOCs are commonly encountered at hazardous waste sites and some require special consideration because of unique attributes. VOCs contaminating sub-surface soil and groundwater can volatilize upward and intrude into indoor air spaces resulting in potential exposure. If the VOC,
TCE, has been detected at a site where women of child-bearing age may reside, a DTSC toxicologist should be consulted, since short-term exposure to TCE has been determined to pose a risk to the developing fetus, and this potential hazard must be addressed in a screening risk evaluation. The short-term action level for TCE is 2 µg/m³ for residential indoor air\(^{53}\).

### 2.5.2.4 EXPOSURE POINT CONCENTRATIONS

An exposure point concentration of a chemical is the estimated concentration that is contacted by a receptor over an assumed duration of exposure. Generally, in a PEA, the maximum contaminant value detected from sampling should be used as the exposure point concentration.

For chemicals which were treated or stored on site, or for chemicals which are suspected to have been released on the site but sample data indicate the contaminant concentration is below the sample quantification limit (SQL, the practical quantification limit or PQL), then the value of the SQL should be used as the exposure point concentration.

In cases where there is adequate characterization, the 95 percent upper confidence limit (UCL) of the arithmetic mean may be used for the exposure point concentration, subject to review and approval by the DTSC project manager and toxicologist.

### 2.5.2.5 TOXICITY VALUES

Toxicity values are embedded in the derivation of the media-specific screening levels, such as RSLs. In general, the most conservative toxicity values developed by entities within the Cal/EPA or the USEPA are used in calculating those screening levels. Therefore, selecting appropriate toxicity values is not necessary when using the method described above where the maximum concentration is compared to an acceptable generic screening concentration. If no screening level exists for a COPC, a DTSC toxicologist should be consulted for identifying an appropriate surrogate or developing applicable toxicity criteria.

Toxicity values will be needed if conducting a PEA using the alternative simplified exposure and risk equations described in Section 2.5.4. The selection of applicable toxicity values should always be based on a rigorous, scientific evaluation of the supporting toxicity studies and on the best available science. Generally, the more protective cancer and non-cancer toxicity criteria currently available from the USEPA and OEHHA should be used in a PEA with approval from a DTSC toxicologist. The most often cited sources of toxicity values include:

- US EPA's Integrated Risk Information System (IRIS)\(^ {54}\).


Cancer potency factors and reference exposure levels (RELs) developed by OEHHA\textsuperscript{55}, \textsuperscript{56}.

Toxicity values used to develop environmental criteria promulgated into California regulations, such as those used to calculate “No Significant Risk Levels” and “Maximum Allowable Dose Levels” (Proposition 65), or those used to derive California drinking water Maximum Contaminant Levels (MCLs) or the health-based dose criteria used to develop Public Health Goals (PHGs, which serve as the starting point for the ultimate development of MCLs).

Provisional Peer Reviewed Toxicity Values (PPRTVs) derived by the US EPA Superfund Health Risk Technical Support Center (STSC). A DTSC toxicologist should be consulted prior to using any PPRTV in a PEA.

Use of oral cancer potency factors or chronic non-cancer toxicity criteria does not correct for differences in absorption and metabolism between the oral and dermal routes, nor are direct toxic effects on the skin accounted for. Thus, the use of oral potency factors or chronic non-cancer toxicity criteria may not satisfactorily express the dermal risk or hazard of a particular chemical. However, the other routes of exposure evaluated in the PEA usually overwhelm the dermal route and minimize any methodological uncertainty.

### 2.5.3 RISK/HAZARD CHARACTERIZATION

The basic screening risk equations are presented in Section 2.5. For a chemical identified as a carcinogen, the maximum soil or groundwater concentration detected is divided by its residential soil or tap water screening level (RSL), (calculated assuming a target risk of $10^{-6}$ and modified, if necessary, as discussed in DTSC HHRA Note 3 so that the screening levels utilized are those specifically recommended by DTSC) and multiplied by $10^{-6}$ to calculate the cancer risk posed by that chemical. For a chemical identified as causing adverse non-cancer health effects, the maximum concentration is simply divided by its screening level, assuming a Hazard Quotient (HQ) of one, to get a HQ for that chemical. The excess lifetime cancer risk for carcinogenic compounds is calculated for those compounds considered by Cal/EPA or USEPA to pose a carcinogenic risk to humans. This value represents the risk, or theoretical probability, of developing cancer from that chemical upon exposure to that medium. The HQ is calculated for each compound, carcinogenic as well as non-carcinogenic. This value is a measure of the non-carcinogenic toxicity of a compound; it is not a probability. The HQ is the ratio of the estimated dose from exposure to a compound in a medium, to a value which is believed not to produce adverse health effects.

For a VOC, the maximum soil vapor concentration detected is evaluated as described in Section 2.5.4.5.3 Vapors Indoor – Soil Vapors. If VOCs are detected in groundwater, the maximum VOC concentration detected in that medium is evaluated as described in

\textsuperscript{55} OEHHA Toxicity Criteria Database. OEHHA. http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
\textsuperscript{56} OEHHA Reference Exposure Levels. http://www.oehha.ca.gov/air/allrels.html
Section 2.5.4.5.4 Vapors Indoor – Groundwater. The objective of the methods described in these sections is to calculate indoor air concentrations from soil vapor and groundwater VOC concentrations and then compare those indoor air concentrations with screening air RSLs modified, if necessary, as discussed in DTSC HHRA Note 3 so that the screening levels utilized are those specifically recommended by DTSC in the same way as described above for soil and groundwater.

CUMULATIVE CANCER RISK CALCULATION. As stated above, the maximum chemical concentration for each site-related chemical in each relevant environmental medium should be divided by their corresponding soil, tap water, or air risk-based screening level. For a carcinogenic chemical, the ratio is multiplied by $10^{-6}$ to get a risk estimate for that chemical. For multiple carcinogenic chemicals, the risks for individual chemicals are added to get a screening estimate of the cumulative risk.

CUMULATIVE NON-CANCER HAZARD CALCULATION. For all chemicals causing non-carcinogenic health effects, the ratios derived by dividing the maximum concentration of each chemical by its corresponding soil, tap water, or air screening level based on non-carcinogenic effects (HQs) are summed to get a site-related Hazard Index (HI) over all chemicals and all media evaluated (soil, air, water, as appropriate). If this HI is greater than 1, then the HIs should be recalculated by only summing exposure to all media for chemicals which have the same toxic manifestation or affect the same target organ. The DTSC toxicologist should be consulted for guidance in grouping compounds.

If the cumulative risk is less than one-in-a-million ($1 \times 10^{-6}$) and the Hazard Index is less than one, the PEA human health screening risk evaluation report may be used as support for a “no further action” (NFA) decision.

2.5.4 ALTERNATIVE SIMPLIFIED EXPOSURE AND RISK EQUATIONS

It is unlikely that the site soil or water will be contaminated with chemicals considered toxic that do not have generic screening levels. For chemicals without such levels, the Environmental Professional should consult with the DTSC project manager and toxicologist to decide if the approach and equations discussed below should be used and how toxicity criteria will be selected.

Equations for evaluating exposure to VOCs coming from the sub-surface soil and/or groundwater and intruding indoors are provided in Sections 2.5.4.5.3 and 2.5.4.5.4 below.

The equations in the figures below are risk and hazard equations based on the USEPA Risk Assessment Guidance for Superfund (RAGS)$^{57}$, Volume 1, Human Health Evaluation, Manual, Part A (1989), Part E Supplemental Guidance for Dermal Risk Assessment (2004), and Part F Supplemental Guidance for Inhalation Risk Assessment (2009) which have been simplified by incorporating default exposure values to achieve a

---

$^{57}$ Links to USEPA’s Risk Assessment Guidance documents can be found on their Human Health: Exposure Assessment Web page at: http://www.epa.gov/oswer/riskassessment/human_health_exposure.htm
reasonable maximum estimation of exposure in a residential setting. These equations are presented because they provide information on the default exposure and risk/hazard evaluation approach, and they may be used if comparison to generic, established screening levels is not adequate for performing a PEA. These equations show how the risk and hazard for each exposure pathway are calculated. The equations for risk and hazard use the same default factors, except for the averaging time (AT) which is expressed in units of days (oral, dermal) or hours (inhalation). For cancer risk, exposures are averaged over a 70 year lifetime. For non-carcinogenic hazards, exposures are averaged over the assumed exposure duration. When evaluating non-carcinogenic hazard, a child (the receptor with the greatest estimated exposure) is generally evaluated. If an HI of one is not exceeded for the child, it will not be exceeded for any other age.

The risk/hazard equations are simplified to a pathway exposure factor and three variables: the chemical-specific toxicity value (slope factor (SF) or inhalation unit risk (IUR); Reference Dose (RfD); Reference Concentration (RfC) or Reference Exposure Level (REL)), the concentration of the chemical in the medium (C), and a dermal bioavailability term, if necessary. Importantly, these equations are not intended and should not be used for performing a quantitative, site-specific human health risk assessment. If dermal exposure is a major concern at a site, this should be so stated in the conclusion of the PEA. Further evaluation should then be considered according to the guidance provided in the USEPA RAGS, Volume 1, Part E.⁵⁸

2.5.4.1 SELECTION OF PATHWAYS INVOLVING ENVIRONMENTAL MEDIA

The soil and air risk/hazard estimates must be calculated for all sites. If groundwater is contaminated with VOCs, the risk/hazard from the vapor intrusion exposure pathway should be calculated for the site, regardless of any beneficial use determinations. The assessment of the potential impact that onsite contamination may have on surface and groundwater is complex and will vary with site-specific conditions. In a PEA, groundwater should be considered a potential drinking water source, even though tap water is usually supplied by a municipal water source. Under certain circumstances, it may not be necessary to evaluate site groundwater as a drinking water source. A detailed rationale for eliminating the drinking water pathway must be provided in the PEA report. If the property itself has contaminated the site groundwater and groundwater flows offsite, then offsite receptors should be evaluated.

The following are potential preliminary evaluation results and the required risk/hazard calculations for each case:

1) At sites with limited soil contamination, the contaminants may not affect surface water or water bearing zones, now or in the future. In these cases the risk/hazard from water exposure need not be calculated. Calculation of the risk/hazard from soil and air will suffice.

2) When the characterization of surface or groundwater contamination is adequate and the available water data are likely to represent the maximum concentrations of the contaminants, then the risk/hazard from water, soil, and air should be calculated.

3) When an acknowledged potential (which requires further investigation) exists for surface or groundwater to be affected by onsite contaminants, and available water data do not fully represent the nature and extent of the contamination, then the risk/hazard from water, soil, and air should be calculated. A qualifying statement should be included in the PEA to indicate clearly that the estimate of risk/hazard is based on data from water that may not represent the maximum contaminant concentrations present and that a final decision will be deferred until after further investigation.

4) When site-specific information is insufficient to judge the potential impact of contaminants in surface water and groundwater, then the calculation of risk/hazard should not proceed, because the resulting estimates may not reflect the potential risk/hazard posed by onsite contamination. In these instances the scoping and data collection phases of the investigation should be reviewed, as it is likely that additional site work will be necessary to gather the information to complete the calculations.

2.5.4.2 WATER PATHWAY

If water is a pathway of exposure for the site, the maximum groundwater concentration of a chemical is compared to its tap water RSL. As stated earlier, MCLs should not be used in a risk evaluation. If the chemical concentration is above its RSL, DTSC should be consulted, as additional evaluation may be necessary. The risk calculated is a summation of ingestion exposure, inhalation of VOCs released from water used indoors, inhalation of vapors migrating indoors from groundwater, and dermal exposure, for child and adult. These equations do not include exposure from ingestion of aquatic organisms in surface water but do include dermal absorption of contaminants in water. Chemical-specific Kp values for use in these following water equations may be found in the Estimation Programs Interface (EPI) Suite, developed by the USEPA59.

59 USEPA Exposure Assessment Tools and Models. 
http://www.epa.gov/opptintr/exposure/pubs/episuitedl.htm
FIGURE 2-2 DERIVATION OF HAZARD INDEX EQUATION FOR NON-VOCs IN WATER

Basic Equation:

\[
\text{Hazard index}_{\text{nonvoc, water}} = \frac{(1/\text{RfDo}) \times C_w}{\text{BW} \times \text{AT}} \times \frac{\text{IR}_w \times \text{EF} \times \text{ED}_{\text{child}}}{\text{BW} \times \text{AT}} + \frac{(1/\text{RfDo}) \times C_w \times \text{SA} \times K_p \times ET \times \text{EF} \times \text{ED} \times (1L/1000cm^3)}{\text{BW} \times \text{AT}}
\]

Where:

- \(\text{RfDo}\) = oral reference dose (mg/kg-day)
- \(\text{BW}\) = body weight (15 kg-child)
- \(\text{AT}\) = averaging time (ED x 365 days/year; 2190 days-child)
- \(\text{EF}\) = exposure frequency (350 days/year)
- \(\text{ED}\) = exposure duration (6 years-child)
- \(\text{IR}_w\) = intake rate (0.78 L/day-child)
- \(\text{ET}\) = exposure time during bathing (child – 0.54 hr/day)
- \(\text{SA}\) = skin surface area available for contact (6,378 cm\(^2\)-child)
- \(K_p\) = chemical-specific dermal permeability coefficient from water (cm/hour)
- \(C_w\) = concentration of chemical in water (mg/L)

Reduced Equation:

\[
\text{Hazard index}_{\text{nonvoc water}} = [(C_w/\text{RfDo}) \times 0.0499] + [(C_w/\text{RfDo}) \times 0.220 \times K_p]
\]
FIGURE 2-3 DERIVATION OF HAZARD INDEX EQUATION FOR VOCs IN WATER

Basic Equation:

\[
\text{Hazard index}_{\text{voc, water}} = \frac{(1/RfD_o) \times C_w \times IR_w \times EF \times ED_{\text{child}}}{BW \times AT_{\text{ing}}}
\]

\[
+ \frac{(1/RfD_o) \times C_w \times SA \times K_p \times ET_B \times EF \times ED \times (1L/1000cm^3)}{BW \times AT_{\text{derm}}}
\]

\[
+ \frac{(1/RfC) \times C_w \times K \times ET_{\text{air}} \times EF \times ED_{\text{child}}}{AT_{\text{inh}}}
\]

\[
+ \text{Hazard index}_{\text{vapor intrusion to Indoor Air}}
\]

Where:

- \(RfD_o\) = oral reference dose (mg/kg-day)
- \(RfC\) = reference concentration (mg/m^3)
- \(BW\) = body weight (15 kg-child)
- \(AT_{\text{ing,derm}}\) = averaging time (ED x 365 days/year; 2190 days-child)
- \(AT_{\text{inh}}\) = averaging time (ED x 365 days/year x 24 hours/day; 52,560 hrs-child)
- \(EF\) = exposure frequency (350 days/year)
- \(ED\) = exposure duration (6 years-child)
- \(IR_w\) = intake rate (0.78 L/day-child)
- \(ET_B\) = exposure time during bathing (child – 0.54 hr/day)
- \(SA\) = skin surface area available for contact (6,378 cm^2-child)
- \(K_p\) = chemical-specific dermal permeability coefficient from water (cm/hour)
- \(ET_{air}\) = 24 hr/day
- \(K\) = Andelman volatilization factor (0.5 L/m^3)
- \(C_w\) = concentration of chemical in water (mg/L)

Reduced Equation:

\[
\text{Hazard index}_{\text{water}} = [(C_w/RfD_o) \times 0.0499] + [(C_w/RfD_o) \times 0.220 \times K_p] + [(C_w/RfC \text{ or REL}) \times 0.479] + \text{Hazard index}_{\text{vapor intrusion to Indoor Air}}
\]

*Notes:

1. RfCs have units of mg/m^3, whereas reference exposure levels (RELs) have units of µg/m^3. This equation is based on an inhalation toxicity criterion with units of mg/m^3. Therefore, if a REL will be used in the equation, the REL units must first be converted from µg/m^3 to mg/m^3.
2. The Andelman volatilization factor (K) of 0.5 L/m^3 is used to evaluate household use of water e.g. showering, laundering, and dish washing.
FIGURE 2-4 DERIVATION OF RISK EQUATION FOR NON-VOCs IN WATER

**Basic Equation:**

\[
\text{Risk}_{\text{nonvoc, water}} = SF_o \times C_w \times \frac{IR_w \times EF \times ED_{\text{adult}}}{BW_{\text{adult}} \times AT} + SF_o \times C_w \times \frac{IR_w \times EF \times ED_{\text{child}}}{BW_{\text{child}} \times AT} + SF_o \times C_w \times \frac{SA_{\text{adult}} \times K_p \times ET \times EF \times ED_{\text{adult}} \times (1L/1000 \text{ cm}^3)}{BW_{\text{adult}} \times AT} + SF_o \times C_w \times \frac{SA_{\text{child}} \times K_p \times ET \times EF \times ED_{\text{child}} \times (1L/1000 \text{ cm}^3)}{BW_{\text{child}} \times AT}
\]

**Where:**

- \(SF_o\) = Slope factor (\([\text{mg/kg-day}]^{-1}\))
- \(BW\) = body weight (80 kg-adult; 15 kg-child)
- \(AT\) = averaging time (70 years x 365 days/year; 25,550 days)
- \(EF\) = exposure frequency (350 days/year)
- \(ED\) = exposure duration (20 years-adult; 6 years-child)
- \(IR_w\) = ingestion rate (2.5 L/day-adults; 0.78 L/day-child)
- \(ET\) = exposure time during bathing (0.71 hr/day-adult; 0.54 hr/day-child)
- \(SA\) = skin surface area available for contact (20,900 cm\(^2\)-adult; 6,378 cm\(^2\)-child)
- \(K_p\) = chemical-specific dermal permeability coefficient from water (cm/hour)
- \(C_w\) = concentration of chemical in water (mg/L)

**Reduced Equation:**

\[
\text{Risk}_{\text{water}} = (SF_o \times C_w \times 0.0128) + (SF_o \times C_w \times 0.0697 \times K_p)
\]
FIGURE 2-5 DERIVATION OF RISK EQUATION FOR VOCs IN WATER

Basic Equation:
\[
\text{Risk}_{\text{voc, water}} = SF_o \times C_w \times \frac{IR_w \times EF \times ED_{\text{adult}}}{BW_{\text{adult}} \times AT_{\text{ing}}}
\]
+ \[SF_o \times C_w \times \frac{IR_w \times EF \times ED_{\text{child}}}{BW_{\text{child}} \times AT_{\text{ing}}}
\]
+ \[SF_o \times C_w \times \frac{SA_{\text{adult}} \times K_p \times ET_B \times EF \times ED_{\text{adult}} \times (1 \text{L}/1000 \text{cm}^3)}{BW_{\text{adult}} \times AT_{\text{derm}}}
\]
+ \[SF_o \times C_w \times \frac{SA_{\text{child}} \times K_p \times ET_B \times EF \times ED_{\text{child}} \times (1 \text{L}/1000 \text{cm}^3)}{BW_{\text{child}} \times AT_{\text{derm}}}
\]
+ \[(\text{IUR}) \times 1000 \mu g/mg \times C_w \times \frac{K \times ET_{\text{air}} \times EF \times ED_{\text{resident}}}{AT_{\text{inh}}}
\]
+ Risk\text{Vapor Intrusion to Indoor Air}

Where:
- SF\text{ }_o = \text{Slope factor ([mg/kg-day]}^{-1})
- IUR = \text{Inhalation unit risk factor ([µg/m}^3{]}^{-1})
- BW = \text{body weight (80 kg-adult; 15 kg-child)}
- AT_{\text{ing,derm}} = \text{averaging time (70 years x 365 days/year; 25,550 days)}
- AT_{\text{inh}} = \text{averaging time (70 years x 365 days/year x 24 hours/day; 613,200 hrs)}
- EF = \text{exposure frequency (350 days/year)}
- ED = \text{exposure duration (20 years-adult; 6 years-child; 26 years-resident combine (adult and child))}
- IR_w = \text{Intake rate (2.5 L/day-adults; 0.78 L/day-child)}
- ET_B = \text{exposure time during bathing (0.71 hr/day-adult; 54 hr/day-child)}
- SA = \text{skin surface area available for contact (20,900 cm}^2{-}\text{-adult; 6,378 cm}^2{-}\text{-child)}
- K_p = \text{chemical-specific dermal permeability coefficient from water (cm/hour)}
- ET_{\text{air}} = \text{24 hr/day}
- K^* = \text{Andelman volatilization factor (0.5 L/m}^3{)}
- C_w = \text{concentration of chemical in water (mg/L)}

Reduced Equation:
\[
\text{Risk}_{\text{water}} = (SF_o \times C_w \times 0.0128) + (SF_o \times C_w \times 0.0687 \times K_p) + (\text{IUR} \times C_w \times 178) + \text{Risk}_{\text{Vapor Intrusion to Indoor Air}}
\]

*Note: \text{The Andelman volatilization factor (K) of 0.5 L/m}^3{\text{ is used to evaluate household use of water e.g. showering, laundering, and dish washing.}}
2.5.4.3 SOIL PATHWAY

Contaminated soil is evaluated by comparing the maximum soil concentration of a chemical to its generic screening level to derive the risk/hazard posed by that concentration as discussed in Section 2.5.3. If additional or alternative evaluation is necessary, the equations in the figures below may be used. The risk calculated is a summation of the incidental soil ingestion exposure for a child and an adult, and the dermal exposure for a child and an adult. Hazard is calculated for the first 6 years of childhood. If the HI is not exceeded for the child, it will not be exceeded for any other age. The equations do not include exposure from ingestion of homegrown fruits and vegetables, or products from animal (e.g., meat, milk, eggs) that feed on vegetation grown on contaminated soil. Risk and hazards from vapors emanating from soil are discussed in Section 2.5.4.4.

The dermal absorption fractions for specific chemicals and chemical classes for use in these soil equations are given in Appendix A, Table 1.
FIGURE 2-6 DERIVATION OF HAZARD INDEX EQUATION FOR SOIL

**Basic Equation:**

\[
\text{Hazard index}_{\text{soil}} = \left(1/RfD_0\right) \times C_s \times \frac{\text{IR}_{s, \text{child}} \times \text{EF} \times \text{ED}_{\text{child}} \times 10^{-6}}{\text{BW}_{\text{child}} \times \text{AT}}
\]

\[
+ \left(1/RfD\right) \times C_s \times \frac{\text{SA}_{\text{child}} \times \text{AF} \times \text{ABS} \times \text{EF}_{\text{child}} \times \text{ED}_{\text{child}} \times 10^{-6}}{\text{BW}_{\text{child}} \times \text{AT}}
\]

**Where:**

- \(RfD_0\) = oral reference dose (mg/kg-day)
- \(BW\) = body weight (15 kg-child)
- \(AT\) = averaging time (6 years x 365 days/year; 2190 days-child)
- \(EF\) = exposure frequency for soil ingestion and dermal contact (350 days/year)
- \(ED\) = exposure duration (6 years-child)
- \(\text{IR}_{s}\) = incidental soil ingestion rate (200 mg/day-child)
- \(SA\) = exposed skin surface area (2900 cm\(^2\)-child)
- \(AF\) = soil to skin adherence factor (0.2 mg/cm\(^2\)-child)
- \(ABS\) = fraction of chemical absorbed from soil
- \(C_s\) = concentration of chemical in soil (mg/kg)

**Reduced Equation:**

\[
\text{Hazard index}_{\text{soil}} = \left[\left(C_s/RfD\right) \times 1.28 \times 10^{-5}\right] + \left[\left(C_s/RfD\right) \times 3.71 \times 10^{-5} \times \text{ABS}\right]
\]
**FIGURE 2-7 DERIVATION OF RISK EQUATION FOR SOIL**

Basic Equation:

\[
Risk_{\text{soil}} = SFo \times Cs \times \frac{IR_{s,\text{adult}} \times EF \times ED_{\text{adult}} \times 10^{-6} \text{ kg/mg}}{BW_{\text{adult}} \times AT} \\
+ SFo \times Cs \times \frac{IR_{s,\text{child}} \times EF \times ED_{\text{child}} \times 10^{-6} \text{ kg/mg}}{BW_{\text{child}} \times AT} \\
+ SFo \times Cs \times \frac{SA_{\text{adult}} \times AF \times ABS \times EF \times ED_{\text{adult}} \times 10^{-6} \text{ kg/mg}}{BW_{\text{adult}} \times AT} \\
+ SFo \times Cs \times \frac{SA_{\text{child}} \times AF \times ABS \times EF \times ED_{\text{child}} \times 10^{-6} \text{ kg/mg}}{BW_{\text{child}} \times AT}
\]

Where:

- **SFo** = Slope factor (\([\text{mg/kg-day}]^{-1}\))
- **BW** = body weight (80 kg-adults, 15 kg-child)
- **AT** = averaging time (70 years x 365 days/year; 25,550 days)
- **EF** = exposure frequency for soil ingestion (350 days/year)
- **ED** = exposure duration (20 years-adult, 6 years-child)
- **IRs** = incidental soil ingestion rate (100 mg/day-adult, 200 mg/day-child)
- **SA** = exposed skin surface area (6032 cm²-adult, 2900 cm²-child)
- **AF** = soil to skin adherence factor (0.07 mg/cm²-adult, 0.2 mg/cm²-child)
- **ABS** = fraction of chemical absorbed from soil
- **Cs** = concentration of chemical in soil (mg/kg)

Reduced Equation:

\[
Risk_{\text{soil}} = (SFo \times Cs \times 1.44 \times 10^6) + (SFo \times Cs \times 4.62 \times 10^6 \times ABS)
\]
2.5.4.4 AIR PATHWAY

The risk and hazard index (HI), for the air pathway are based on either the exposure to volatile emissions coming from soil for VOCs and/or the exposure to fugitive dust emissions from soil for non-VOCs. A VOC is a chemical with a Henry’s Law constant of $1 \times 10^{-5}$ atmospheres-m$^3$/mole or greater. A representative list of VOCs is given in the DTSC Vapor Intrusion Guidance$^{60}$.

The risk and hazard equations for VOCs and non-VOCs are presented in the figures below. The estimated risk is based on childhood and adult exposure. The HI is calculated for the first 6 years of childhood, because the HI for the child will not be exceeded by the HI for any other age. Air monitoring data generally are not needed for a PEA screening evaluation but are useful for worker health and safety monitoring and fence line monitoring for non-occupational receptors during removal actions.

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$^{60}$ DTSC. 2011. *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance)*. October. [http://www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm](http://www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm)
FIGURE 2- 8 DERIVATION OF HAZARD INDEX FOR EQUATION FOR AIR

Basic Equation:

\[
\text{Hazard Index}_{\text{air}} = \frac{1}{\text{RfC} \times 1000 \, \text{µg/m}^3} \times \frac{\text{Ca} \times \text{ET} \times \text{EF} \times \text{ED}_{\text{child}}}{\text{AT}}
\]

Where:
- \(\text{RfC}\) = Reference concentration (mg/m\(^3\))
- \(\text{Ca}\) = Concentration in air (µg/m\(^3\))
- \(\text{EF}\) = Exposure frequency (350 days/year)
- \(\text{ED}_{\text{child}}\) = Child exposure duration (6 years)
- \(\text{ET}\) = Exposure time (24 hours/day)
- \(\text{AT}\) = Averaging time (6 years x 365 days/year x 24 hours/day; 52,560 hrs-child)

Reduced Equation:

\[
\text{Hazard Index}_{\text{air}} = \frac{1}{\text{RfC}} \times \text{Ca} \times 0.000959
\]

*Note:
1. RfCs have units of mg/m\(^3\), whereas reference exposure levels (RELs) have units of µg/m\(^3\). This equation is based on an inhalation toxicity criterion with units of mg/m\(^3\). Therefore, if a REL will be used in the equation, the REL units must first be converted from µg/m\(^3\) to mg/m\(^3\).
FIGURE 2-9 DERIVATION OF RISK EQUATION FOR AIR

Basic Equation:

\[
\text{Risk}_{\text{air}} = \text{IUR} \times \text{Ca} \times \frac{\text{ET} \times \text{EF} \times \text{ED}_{\text{adult + child}}}{\text{AT}}
\]

Where:
- IUR = Inhalation unit risk factor (µg/m³)⁻¹
- Ca = Concentration in air (µg/m³)
- EF = Exposure frequency (350 days/year)
- ED_{adult + child} = Exposure duration for resident (26 years total)
- ET = Exposure time (24 hours/day)
- AT = Averaging time (70 years x 365 days/year x 24 hours/day; 613,200 hours)

Reduced Equation:

\[
\text{Risk}_{\text{air}} = \text{IUR} \times \text{Ca} \times 0.356
\]
2.5.4.5 ESTIMATION OF AIR CONCENTRATION

The air concentration of VOCs and non-VOCs emanating from soil are calculated differently. Semi-volatile organic compounds and metals in soil are evaluated in outdoor air using particulate emission factors (PEFs) to obtain concentrations of chemicals in dust. VOCs in soil are evaluated as discussed in Sections 2.5.4.5.2 and 2.5.4.5.3.

2.5.4.5.1 PARTICULATE MATTER

PEFs are used to develop an estimate of the concentration of a chemical in dust based on its concentration in soil. This approach assumes that the dust from the site is caused by the wind and not created by mechanical means (e.g. construction activities, tilling, automobile traffic, etc.). A default PEF of 1.36E+09 (m³/kg) is used, because this is the same default value used by the USEPA in their RSL Calculator. The default PEF assumes an infinite source of chemicals, a vegetative cover of 50%, and a mean annual wind speed of 4.69 m/s, which is equivalent to a dust concentration of 0.76 μg/m³ at the receptor. The default dispersion term (Q/C) of 93.77 (g/m²-s per kg/m³) is based on a site of 0.5 acres and dispersion modeling runs of 29 sites across the United States. The default Q/C provides a conservative estimate of the long-term exposure to dust. Site-specific Q/Cs may be used if demonstrated to be applicable for estimation of long-term exposure to dust at a site.

Figure 2-10 provides an equation for estimating a non-volatile chemical concentration in air as suspended soil particulates.

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FIGURE 2-10 ESTIMATION OF AIR CONCENTRATION FOR NON-VOCS

\[ Ca = \frac{Cs}{PEF} \times 1000 \text{ ug/m}^3 \]

Where,

- \( Ca \) = Chemical Concentration in Air, \( \text{ug/m}^3 \)
- \( Cs \) = Maximum Reported Soil Concentration, \( \text{mg/kg} \)
- \( PEF \) = Particulate Emission Factor (default = \( 1.36 \times 10^9 \text{ m}^3/\text{kg} \))

\[ = \frac{Q}{C} \times \frac{3600 \text{ sec/hr}}{0.036 \times (1-V) \times \left(\frac{U_m}{U_t}\right)^3 \times F(x)} \]

Where,

- \( Q/C \) = Inverse of mean concentration at the center of a 0.5-acre-square source

\[ \left( \text{default} = 93.77 \text{ g/m}^2 \cdot \text{sec/} \text{kg/m}^3 \right) \]

- \( V \) = Fraction of vegetative cover (default = 0.5 or 50%)
- \( U_m \) = Mean annual wind speed cover (default = 4.69 m/sec)
- \( U_t \) = Equivalent threshold value of windspeed at 7 m (default = 11.32 m/sec)
- \( F(x) \) = Function dependent on \( U_m/U_t \) (default = 0.194)

USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, December 2002
2.5.4.5.2 VAPORS OUTDOOR

Although there may be exposure to VOCs in the outdoor or ambient air emanating from soil, this pathway is usually insignificant compared to the indoor air pathway. Therefore, the VOC outdoor air pathway is not included in these equations for the sake of simplicity. This represents a deviation from the equations used to develop RSLs which do include inhalation of VOCs in outdoor air.

2.5.4.5.3 VAPORS INDOOR – SOIL VAPORS

VOCs in indoor air may be present as the result of volatilization of compounds intruding indoors from sub-surface soil. The inhalation of indoor air contaminated by vapors coming from soil is the overriding exposure pathway for VOCs. The following approach may be used to estimate hazard and risk in a screening risk evaluation. First, the indoor air concentration is calculated based upon the following equation.

\[
\alpha = \frac{C_{\text{Indoor}}}{C_{\text{Soil Vapor}}}
\]

where:

- \(\alpha\) = Steady-state attenuation factor, the ratio of the concentration of the VOC indoors to the concentration of the VOC in soil vapor
- \(C_{\text{Soil Vapor}}\) = Measured soil vapor concentration in \(\mu g/m^3\)
- \(C_{\text{Indoor}}\) = Indoor air concentration in \(\mu g/m^3\)

Therefore:

\[
C_{\text{Indoor}} = \alpha \times C_{\text{Soil Vapor}}
\]

The attenuation factors used should be those recommended in the most current version of the *Vapor Intrusion Guidance*\(^6\). The attenuation factor is 0.002 for existing residences or 0.001 for future residences. If the soil vapor concentration represents a sub-slab concentration beneath an existing building, the attenuation factor to be used is 0.05. The equation is solved for the indoor air concentration in the building. If a carcinogen, this estimated indoor air concentration is divided by its DTSC-recommended residential air screening level and multiplied by \(10^{-6}\) to calculate the cancer risk in indoor air for the specific VOC. If identified as causing adverse non-cancer health effects, the indoor air concentration is divided by its screening level to get a HQ for that chemical. If no screening level exists for the chemical, the concentration may be input as the \(C_a\) in the equations shown in Figures 2.8 and 2.9 to calculate the hazard and risk posed by the VOC.

\(^6\) DTSC. 2011. *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance).* October. [http://www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm](http://www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm)
2.5.4.5.4 VAPORS INDOOR – GROUNDWATER

Evaluation of the inhalation of a vapor migrating indoors from groundwater may be performed by first converting the groundwater VOC concentration to a soil vapor concentration as described in the *Vapor Intrusion Guidance*. The conversion equation is:

\[ C_{\text{soil vapor}} = C_{\text{groundwater}} \times H_c \times C_f \]

Where:
- \( C_{\text{soil vapor}} \) = Soil vapor concentration in µg/m³
- \( C_{\text{groundwater}} \) = Groundwater concentration in µg/L
- \( H_c \) = Henry’s law constant (unitless)\(^{63}\)
- \( C_f \) = Conversion factor (1000L/m³)

The calculated soil vapor concentration is used to estimate the indoor air concentration, as shown in Section 2.5.4.5.3 and the risk and/or hazard calculated.

If VOCs are detected in soil vapor and/or groundwater, it is important to consult the current version of DTSC’s *Vapor Intrusion Guidance*\(^ {64} \) for more detailed information, as the issue of vapors intruding indoors from the subsurface is rapidly evolving.

2.5.4.6 SUMMATION OF RISK/HAZARD FOR ALL MEDIA

For cancer risk, sum risks from each carcinogen over all exposure media and for all carcinogens to obtain the total excess lifetime cancer risk posed by the contaminants at the site. For hazard, sum the hazard quotients from each compound over all exposure media and for all chemicals to obtain the HI posed by the contaminants at the site. For screening purposes, this simplifies the calculation of HI by disregarding the toxic manifestation/target organ affected by each compound. If this HI is greater than 1, then the HIs should be recalculated by only summing exposure to all media for chemicals which have the same toxic manifestation or affect the same target organ. The DTSC toxicologist should be contacted for guidance in grouping compounds.

A cancer risk estimate greater than 10⁻⁶ or a HI greater than 1 indicates the presence of contamination which may pose a significant threat to human health. Exceptions will generally include sites with elevated background concentrations, sites where other agency criteria are more stringent, and sites with specific circumstances that allow for a risk management decision to increase the acceptable screening levels. In cases where chemicals are left in place exceeding acceptable levels according to a residential

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The chemical-specific Henry’s law constant, given in atm-m³/mol, is multiplied by 41 to obtain the unitless value used in this equation.

\(^{64}\) DTSC. 2011. *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance)*. October. [http://www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm](http://www.dtsc.ca.gov/SiteCleanup/Vapor_Intrusion.cfm)
scenario, a restricted land-use covenant (LUC), an on-going operation and maintenance (O&M) agreement, or other controls may be required. All potential scenarios should be discussed with the DTSC project manager prior to selection of the most applicable scenario for the site.

2.5.5 UNCERTAINTY ANALYSIS

As an option, the PEA report may contain a section qualitatively discussing uncertainties in the human health screening evaluation. This discussion should not debate the validity of the default exposure factors, because such factors are generic to assumed behavioral and physiological factors appropriate for humans in a residential setting (e.g., soil ingestion rates for a child). Instead, the uncertainty section should focus on specific site conditions which contribute most significantly to uncertainty in the risk and hazard estimates. Reliance on the information presented in the uncertainty analysis to decide "no further action" or NFA when the screening evaluation estimates risk greater than 10⁻⁶ or a HI greater than 1, warrants discussions with DTSC.

A quantitative or stochastic uncertainty analysis should not be presented; as such an analysis is beyond the scope of a screening evaluation and is more appropriate in a full baseline risk assessment. An in-depth uncertainty analysis is of no value in a screening evaluation when the outcome of the PEA process is binary, i.e., whether further action or investigation is warranted.

2.6 ECOLOGICAL SCREENING EVALUATION

An ecological screening evaluation should be performed for all sites in a PEA, even sites located in heavily urbanized areas. The ecological screening or scoping evaluation adopts the basic approach suggested by DTSC (DTSC, 1996)⁶⁵ and USEPA (USEPA 1989b⁶⁶, 1992⁶⁷, 1997⁶⁸); however, the evaluation is qualitative rather than quantitative. The ecological screening evaluation relies on the professional judgment of the Environmental Professional to qualitatively evaluate the potential risk to non-human receptors posed by contaminants released on the site. The preparer cannot assume that the human health screening evaluation provides an estimate of the threat to biota. The term "biota" excludes humans, and generally refers to non-domesticated terrestrial and aquatic plants and animals, but can also include domesticated species, such as livestock.

Questions to consider in an ecological screening evaluation:

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• Is habitat present on site?
• Is habitat adjacent to the site?
• Are there “unmanaged” landscape areas?
• Are wetlands, including streams, adjacent to the site?
• Is there potential for overland flow from the site to adjacent wetlands or shorelines?
• Does groundwater have the potential to surface offsite?
• Is groundwater shallow enough for plants to access?
• Is there potential for the presence of special status species? (Special status species are not the only receptors that need to be considered.)
• Does the future end use include open space?
• Will the site remain vacant for some undetermined time prior to development?
• Does the site have features that may attract ecological receptors?
• How large are the affected areas?

The approach used in the screening-level ecological evaluation is to identify potentially complete exposure pathways between the areas of contamination and biota which occupy or potentially could occupy the site in the future, or habitats outside of the site boundary that could potentially be affected by contamination from the site. If there are potentially complete exposure pathways, further site investigation and assessment may be warranted.

2.6.1 SITE CHARACTERIZATION

The chemical and physical characterization of a site for an ecological screening evaluation is similar to that needed to support a human health screening evaluation. However, certain aspects, such as contamination of plants and sediments, may require additional investigation. Particular attention should be given to identification of chemicals of ecological concern to biota, since a chemical not generally considered a threat to human health may be a chemical of concern for biota. The PEA should contain a table listing all detected chemical contaminants, with maximum and minimum concentrations, number of samples collected and number of detections, as well as any information on the specific habitats present where the contaminants were detected.

2.6.2 BIOLOGICAL CHARACTERIZATION

The initial biological characterization of sites in highly urbanized or developed areas with little or no plant community (e.g., paved facilities) is described in the most current Scoping Assessment guidance69 (DTSC, 1996). For other sites, a biological characterization of the site, conducted by a qualified field biologist, is needed to identify the biota actually or potentially occurring at the site. Concerned regulatory agency personnel should be contacted and provided with advance notice of the date and time of the site survey. In many California habitats, a biological characterization should preferentially be conducted

during the time of year in which plants are actively growing (late winter through spring). Plant surveys conducted outside of this time of year may be of limited use as many species that are present may be senescent and difficult to identify or not present.

The biological characterization should allow identification and determination of the extent of coverage of all site-specific habitats. The PEA should include a discussion of how the measure of coverage was selected. Off-site habitats that may be affected by site-related contamination should also be evaluated to the extent practical. Marine or estuarine habitats should be evaluated in terms of both the water and sediment components.

Terrestrial habitats such as forest, oak woodland, grasslands, vernal pools, riparian, lacustrine, palustrine, desert, sand dune, coastal chaparral, and agricultural or maintained landscapes, such as golf courses, should be evaluated and characterized. Transition zone habitats such as freshwater wetlands, saltwater wetlands, brackish wetlands, marine intertidal areas and mudflats of rivers, lakes or streams should be evaluated and characterized. Biological characterization of the site should also identify the species and types of communities potentially impacted due to their occurrence at nearby areas (i.e., within 1 mile). The location of all wildlife areas, preserves, reserves, sanctuaries, parks, natural areas, conservation areas, or other protected areas within 1 mile of the site should be identified.

Particular emphasis should be placed on identification of special status species and their habitats which occur on or within a one-mile radius of the site. Special status species include California species of special concern; state and federally listed rare, threatened or endangered species; and, species which are proposed or recommended for state or federal listing. The California Department of Fish and Wildlife’s (DFW) Biogeographic Data Branch\(^\text{70}\) can be contacted for the current special animal and special plant lists. The DFW's California Natural Diversity Database (NDDB) and the Biogeographic Information and Observation System (BIOS) online mapping tool can be a starting point for location information on special status species which have been found near the site; however, the NDDB and BIOS are not all-inclusive listings.

In lieu of an extensive site-specific biological survey conducted over an extended period of time to identify species occupying each distinct habitat, the species expected to occupy each habitat can be identified. In such an instance, a qualified field biologist would first identify each distinct habitat occupying the site and the surrounding area within one mile (include identification of locations where contaminants may be transported). Then the species which can be expected to occupy those habitats can be identified based on the literature.

### 2.6.3 PATHWAY ASSESSMENT

Once potential species and habitats are identified, a pathway assessment is conducted. Pathway assessment identifies the potentially complete exposure pathways for which there is contact between biota and chemicals of concern in any medium and by any route. Media to be considered include soil, air, water, and biota. Physical and chemical characteristics which influence environmental fate and transport must also be considered. In particular, offsite transport of contaminants must be evaluated, e.g., surface drainage pathways or potential contact of ecological receptors via groundwater transport to surface waters. Pathways may be direct, such as inhalation of air, or indirect, such as dietary contamination through the food web. Exposure routes to be evaluated include inhalation, ingestion, and dermal contact. Pathways shall be considered potentially complete unless evidence can be provided to demonstrate that the chemical will not enter the medium or the receptor will not contact the medium, either directly or indirectly, now or in the future. A qualitative description of the magnitude, duration, and frequency of exposure for representative biological receptors, representing multiple trophic levels, should be provided for each contaminant and area of contamination. A tabular summary of the exposure pathway analysis for each habitat type, as depicted in Table 2, Appendix A, should be provided. Such an exposure pathway analysis is an expansion of the conceptual site model shown in Figure 2.1.

2.6.4 QUALITATIVE SUMMARY

A site-wide habitat map is required as part of the ecological screening. All major habitats should be displayed on a map equivalent to a USGS quadrangle map (1:25000). Separate indication of the coverage of tree canopy, shrubs, or dominant herbaceous plants may be appropriate. A site-wide map of similar dimension should indicate historical land use patterns, particularly those land uses which may have resulted in release of hazardous substances. Current land use which differs from historical land use should be indicated. Location of former landfills, waste piles, material stockpiles, burn pits, surface impoundments, firing ranges, strafing or bombing ranges, hazardous waste storage areas, reutilization areas, and surface drainages are especially important. Both the habitat coverage and the land use may be displayed on the same map if the degree of detail is not confusing. Additional smaller scale maps of portions of the site may be necessary, as appropriate, to adequately portray habitat-specific information. Industrial sites where future land use is industrial or commercial may not require smaller habitat-specific maps. Chemical concentration data can be overlaid if it can be presented clearly on the same map with sample locations and site use information. If chemical concentration data cannot be presented clearly on a map, then sample location identifiers should be provided which can be used to match concentrations presented in a table with sample locations on the map.

A qualitative statement should be provided which summarizes the findings of the screening-level ecological assessment. If the site is found to be impacted by COPCs, but no ecological risks are present because the site is not utilized by biota, wildlife habitats are not present, or there are no actual or potentially complete exposure pathways, this conclusion must be clearly stated and justified based on the information collected. Supporting documentation may include site photographs depicting the lack of habitat. If it
is determined that the potential for exposure to ecological receptors exists, further investigation and assessment may be warranted.

2.7 FAIR MARKET VALUE OF THE PROPERTY

The AAI rule requires an evaluation of the relationship of the purchase price to the fair market value of the property, if the property was not contaminated. This includes making a comparison of price and fair market value and considers whether any differential is due to potential environmental contamination. The evaluation may be conducted by the prospective landowner, grantee, Environmental Professional conducting the inquiry, or another third party hired by the prospective land owner or grantee.

The AAI rule does not require that a real estate appraisal be conducted to meet this criterion. However, if a formal appraisal is conducted for other purposes, the results may serve as a source of information on the fair market value of the property. If a formal appraisal is not available, the determination of fair market value may be made by comparing the price paid for the particular property to prices paid for similar properties located in the same vicinity of the subject property, or by consulting with a qualified real estate expert. The objective is to determine whether the purchase price paid reflects the fair market value and not the exact value of the property. Any significant differences in the purchase price and the fair market value should be noted as well as any reasons for the differences.

If the information is not collected by the Environmental Professional or a person under their supervision or charge, the AAI rule does not require that the information collected and determination made be provided to the Environmental Professional. If the information is not provided, and it is determined that the lack of such information affects his or her ability to identify conditions indicative of releases or threatened releases of hazardous substances, then the Environmental Professional should identify the lack of information as a data gap and comment on its significance. DTSC recommends that this information be made available to the Environmental Professional to avoid creating a data gap.

2.8 COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION

Commonly known or reasonably ascertainable information about the property is a requirement of the AAI rule. Information about a property that is generally known to the public within the community where the property is located, and that can be easily sought and found from individuals familiar with the property or from easily attainable public sources of information must be collected and considered when conducting all appropriate inquiries. In many cases, this information may be incidental to other information collected and separate or distinct efforts to collect the information may not be necessary. Examples of sources of information include: current owners or occupants of neighboring properties; local and state government officials who many have knowledge or information related to the subject property; others with knowledge of the subject property; and other
sources of information (e.g., newspapers, websites, community organizations, local libraries, and historical societies).
CHAPTER THREE

PREPARATION OF THE PEA REPORT

This chapter provides guidance on how to organize the PEA report and what information should be included in the report. The purpose of the report is to document the results of the PEA investigation and screening evaluations and to recommend a course of action for the site.

3.1 SUGGESTED REPORT FORMAT

To provide consistency in documentation of PEA investigations, DTSC recommends use of the report format provided in Figure 3-1.

3.2 SUGGESTED REPORT CONTENTS

The specific information that is suggested to be included in the PEA report is discussed in the following sections. If any information cannot be obtained, a statement to that effect should be included in the report. If information is omitted because it seems irrelevant to the site, the rationale for this omission should be included in the report. Omission of information and rationale for omission are subject to approval by DTSC staff. If it is the intention of the Environmental Professional to include AAI requirements, it is the Environmental Professional’s responsibility to ensure that all specific reporting requirements identified in 40 CFR §312.21 and §312.31 are included.

3.2.1 EXECUTIVE SUMMARY

The executive summary is a complete summary of the site. This section should inform the reader of all the major aspects of the site. Specifically, this section should include, but not be limited to, very brief descriptions of the following:

- Purpose and objectives of investigation;
- Site background and current status;
- Known and potential releases;
- Significant contamination;
- Pathways demonstrating potential threat;
- Potentially exposed populations; and
- Conclusions and recommendations.
FIGURE 3-1 SUGGESTED REPORT FORMAT

Title Page
i. Table of Contents
ii. List of Figures
iii. List of Tables
iv. List of Appendices

Executive Summary
I. Introduction, purpose and objectives, scope of work
   Significant assumptions made
   Modifications or deviations from the final AAI rule
   Information obtained from the landowner or user (for AAI)

II. Site Description
   a. Site Identification Information
   b. Site Geology and Hydrogeology

III. Background
   a. Site status/historical site information
   b. Hazardous material/substance/waste management information
   c. Current and historical use(s) of surrounding properties
   d. AAI required information
   e. Records review information
   f. Site reconnaissance
   g. Interviews

IV. Apparent Problem

V. Environmental Setting
   a. Conceptual Site Model
   b. Factors related to soil pathways
   c. Factors related to water pathways
   d. Factors related to air pathways

VI. Sampling Activities and Results
   a. Summary of activities
   b. Presentation of data
   c. Discussion of results

VII. Human Health Screening Evaluation
   a. Exposure pathways and media of concern
   b. Exposure concentrations and chemicals
   c. Human Health Screening Levels
   d. Toxicity values
   e. Risk characterization summary

VIII. Ecological Screening Evaluation
   a. Site characterization
   b. Biological characterization
   c. Pathway assessment
   d. Qualitative Summary

IX. Community Profile

X. Opinion of Environmental Professional (required by AAI)

XI. Conclusions and Recommendations
   a. Summary and conclusions
   b. Recommendations
   c. Data gaps (required by AAI)
   d. Preliminary scoping recommendations

XII. References

XIII. Signature(s) and qualifications of Environmental Professional(s), including statements required by AAI

XIV. Supporting Documentation (Appendices)
3.2.2 INTRODUCTION

This section should briefly introduce the site and the organization of the report. In doing so, the Environmental Professional should provide the reason for performing the PEA investigation; the methodology used to complete the PEA; any significant assumptions made; the types and years of site operations; and the guidance documents followed during the investigation. For PEAs that include AAI requirements, any modifications or deviations from the final rule requirements should be discussed as well as information obtained from the landowner or user. The Environmental Professional and the person(s) who conducted the site reconnaissance and interviews should be identified.

3.2.3 SITE DESCRIPTION

The site description should include information that identifies the physical setting of the site in relation to the surrounding area.

3.2.3.1 SITE IDENTIFICATION

The following information is recommended for inclusion in this section of the PEA report.

1) **Site Name:** Name of current business operation and/or land use at the site.

2) **Contact Person(s):** Name of the main contact person(s) for the above cited operation.

3) **Site Address:** Street address or nearest cross streets, city, state, county, and zip code.

4) **Mailing Address:** Mailing address for the site if different from the street address (e.g., post office (P.O.) box or offsite business).

5) **Phone Number:** Phone number of any onsite or offsite business office.

6) **Other Site Names:** Former or alternate names for the current and historical operations onsite.

7) **USEPA Identification Number:** Any current or previously assigned numbers.

8) **Property Location:** Describe the property location, including any site or nearby characteristics, and any ecological characterization features. Also describe any structures, roads, and site improvements. A site location map and a site-specific map (facility diagram) may be used to help describe these features. The site location map, with a suggested scale of 1:2400, should show the general location of the site relative to its surroundings. The site location map may identify major highways, surface waters, land use, sensitive populations and critical habitats. The site-specific map should include all significant site features (buildings, tanks, ponds, sumps, etc.) Maps depicting current and historical features should be drawn to a scale appropriate
for the site size. All maps should be oriented with north at the top of the page. Also provide the site’s latitude and longitude in the geographic NAD83 coordination system and the site’s elevation (vertical datum) in NAVD88.

3.2.3.2 SITE GEOLOGY AND HYDROGEOLOGY

Summarize the site geology, including relevant information from published sources and observations made in the field. Discuss the geologic setting, stratigraphy, surface water hydrogeology, and subsurface hydrogeology. The level of detail may vary based on the nature of the impacts to the site. A more detailed description with respect to potential soil and groundwater pathways should be included in sections 3.3.6.2 and 3.3.6.3, described below.

3.2.4 BACKGROUND

3.2.4.1 SITE STATUS AND HISTORY

Each data element below should be provided for all current and past business operations at the site.

1) **Business Type:** Identity and description of the types of businesses which are currently operating or have operated at the site in the past.
2) **Years of Operation:** Operating dates for each business identified.
3) **Prior Land Use:** Identity of the land use prior to development of the site (including the placement of fill upon the property).
4) **Facility Ownership/Operators:** Identity of all persons or corporations which owned and/or operated businesses on the site. Description of the organizational structure of the businesses (i.e., corporation, limited partnership, etc.). Names of operators, partners, and/or any person(s) having operational control of the facility. Description of the roles these persons/corporate officers played in the day-to-day operations at the site. Current street addresses, mailing addresses, and phone numbers for each person and/or corporation identified.
5) **Property Owners:** Narrative summary of the property ownership at the site extending back to the date of first business operations. The narrative should reference title documents and tax assessor parcel maps which should be included as appendices. The narrative should also include current contact information for all persons/corporations identified. If a title search was conducted include the document as an appendix to the PEA.
3.2.4.2 HAZARDOUS MATERIAL/SUBSTANCE/WASTE MANAGEMENT INFORMATION

The following information regarding hazardous material/substance/waste management activities for all current and former businesses that have operated on the property should be provided in the PEA report.

1) **Business/Manufacturing Activities:** Concise description of activities or manufacturing processes for each business currently and formerly operating onsite which utilized or generated hazardous materials/substances/wastes. Summary descriptions, diagrams, flow charts, and/or tables are preferable to long narrative descriptions. At a minimum the following information should be provided.

   a) Type and approximate quantities of products produced/sold per year or the number of services rendered per year.

   b) Amount/type of hazardous substances and/or wastes generated per year.

   c) Primary materials and chemicals used, handled, or sold onsite.

   d) Descriptive overview of the major physical/chemical processes used (e.g. mixing, distillation, combustion, oxidation, polymerization, etc.) for each process or activity.

2) **Onsite Storage, Treatment, and Disposal:** Concise description of waste/substance storage, treatment, and disposal practices for each business currently and formerly operating onsite. Summary descriptions, diagrams, flow charts, and/or tables are preferable to long narrative descriptions. At a minimum the following information should be provided.

   a) Type, capacity, contents, and location of storage units (e.g., tanks, drum storage areas, sumps, pits, ponds, etc.).

   b) Type, capacity, and location of treatment facilities (e.g., neutralization, filtration, distillation, incineration, etc.).

   c) Onsite disposal practices (e.g. land disposal, land spreading, injection, etc.), including volumes of waste disposed.

   d) Containment measures specific to each treatment, storage, and disposal unit onsite.

   e) Waste recovery and/or recycling practices utilized onsite. Indicate volumes and types of wastes recovered/recycled annually.

   f) Origin, types, and quantities of any substances/wastes from offsite sources treated, disposed, or stored on the site.
g) Identification of all leaks, spills, releases or threats of releases of any substances at or from the site (into the environment or within onsite structures). Include when, how and where such releases occurred, and the volume and types of materials released.

3) **Regulatory Status:** The status of any federal, state, or local permits currently or previously held by the facility. Include effective dates of the permit(s) and specific permit requirements and conditions. Attach copies of the permits in the appendices of the PEA report.

4) **Prior Assessments/Remediation:** Identity, evaluation and summary of all assessments, sampling efforts and cleanup activities which have taken place at the site prior to the PEA.

### 3.2.4.3 CURRENT AND HISTORICAL USES OF SURROUNDING PROPERTIES

**Surrounding Land Use:** History and/or general uses of properties in the area surrounding the site should be researched to the extent to which the information is useful to determine the influence of surrounding property use(s) on the site.

### 3.2.4.4 AAI REQUIRED INFORMATION

Any additional information required by the AAI that is not identified as a component of the PEA should be included in this section. Examples of this type of information include fair market value of the property (Section 2.7) and commonly known or reasonably ascertainable information (Section 2.8).

### 3.2.4.5 RECORDS REVIEW

This section should summarize the information found during the records review.

1) **Land Records:** Records such as title records/chain of title documents, environmental liens, easements, recorded documents such as land use covenants (LUCs), engineering controls or institutional controls should be described. Also, describe current land use and zoning, and any proposed land use or zoning changes. If known, the type of allowable land uses associated with the zoning designations should be included. Identify the Assessor’s Parcel Number for the site and include a copy of the County Assessor’s plat map for the parcel(s) where the site is located. The corresponding Township, Range, Section, and Meridian for the site location should also be included.

2) **Aerial Photographs/Site Photographs:** The results of interpretation of aerial photographs with regard to identification of historical development or site activities at the property and at nearby areas (if applicable). If available, information obtained from photographs that document historical site activities.
3) **Fire Insurance Maps:** Information included on insurance maps indicating use of the property by specified dates.

4) **Other Historical Use Sources:** Summary of information obtained from other sources such as street directories, newspaper archives, etc.

5) **Federal, State, Tribal, and Local Records:** Summary of information obtained from records review or databases. Summarize significant findings of federal, state, or local inspections of current or past operations onsite. Include significant sampling results, scope and purpose of the inspection, and conclusions drawn by the inspector.

6) **Site Owner/Operator Records:** Summary of applicable information obtained from the site owner or site operator.

**3.2.4.6 SITE RECONNAISSANCE**

A section describing the methodology used to conduct the visual inspection of the subject property and adjoining properties should be included.

1) **Inspection:** Describe when the inspection was conducted and by whom.

2) **Physical Limitations:** Describe any physical limitations that prevent visual observation of the property (e.g., limited access, safety concerns, etc.)

2) **Interior Observations:** Describe observations made while inspecting interiors of structures or features.

3) **Exterior Observations:** Describe observations made while inspecting exterior portions of the property.

4) **Evidence of Release or Threatened Release:** Describe any observations made that might suggest a release or threatened release of hazardous substances/materials. Examples include: staining, spills, odors, stressed vegetation, corrosion, pools of liquid, discolored water, ground surface alterations, dead or ill wildlife, or other conditions.

**3.2.4.7 INTERVIEWS**

A summary of the interviews conducted should include a description of when the interview was conducted and with whom the interviews were conducted (e.g., current property owner and occupants, site manager, local/state/federal government officials, past site owners and occupants, etc.). The method used to conduct the interview (e.g., in person, written communications, telephone, etc.) should also be identified. If the property is abandoned, interviews with neighboring property owners should be summarized and, if applicable, interviews with past owners and occupants.
3.2.5 APPARENT PROBLEM

This section should summarize the available information regarding known or potential sources of contamination which constitute the primary reason for investigating the site. The summary should include documentation of spills or releases (i.e., date, location, material, and quantities), identification of the contaminants of concern, identification of the primary human and environmental resources of concern, and a description of the exposure pathways. Detailed information related to the apparent problem should be described in subsequent sections of the report.

3.2.6 ENVIRONMENTAL SETTING

During the background research, information should have been collected on the site's environmental characteristics. This information identifies the site environmental conditions which would influence the transport of contaminants from the source of contamination through identified potential exposure pathways to the exposed individual or environmental receptor. DTSC will use the information provided to prioritize those sites requiring remediation.

3.2.6.1 CONCEPTUAL SITE MODEL

Include the Conceptual Site Model (CSM) described in Section 2.1.2. The initial CSM should be updated based on information and data collected during preparation of the PEA.

3.2.6.2 FACTORS RELATED TO SOIL PATHWAYS

1) Describe the topography of the site and the surrounding areas.

2) Describe the predominant soil types at the site, using unified soil classification system (UCSC) terminology and site-specific geologic logs when available. Identify the least and most permeable continuous layers of soil and the permeability of each layer.

3) Describe the surface slope at the site. Also, provide the slope of any intervening terrain between the site and the nearest downhill surface water body. If the site is in a closed basin or is actually located in surface water, this fact should be stated.

4) Describe accessibility to the site in terms of both natural and man-made features or structures which currently restrict human access to the site.

5) Describe any measures which have been taken to contain or prevent direct contact with hazardous substances/materials in or on the soil at the site.
6) Provide the distance to and location of the nearest potentially affected residential area, school, business, day care center, nursing home, senior citizen community, and hospital (for facilities within one mile of the site).
3.2.6.3 FACTORS RELATED TO WATER PATHWAYS

The following information should be provided if a release or threatened release of hazardous substances/materials to water exists at the site.

1) Describe the hydrogeology beneath the site in terms of known aquifers or water-bearing zones, depths to aquifers, hydraulic conductivities, confining layers (i.e., aquitards or aquicludes), discontinuities, aquifer interconnections, and any other features of significance. Cite the professional geologist or professional civil engineer who presented this information.

2) Identify the aquifers (or water-bearing zones) which have been contaminated by a release from the site, or which are threatened to be contaminated as a result of migration of hazardous substances from a release at the site. Identify any aquifers which are connected to an aquifer that has been contaminated by a release from the site. Also identify if the site is located within a regional groundwater plume or describe nearby releases to groundwater that have or may have the potential to impact the site.

Potential data sources: sampling data; local water districts and utilities; county health departments; SWRCB Division of Drinking Water (DDW); Department of Water Resources (DWR); the local Regional Water Quality Control Board (RWQCB).

3) For each of the aquifers or water-bearing zones identified above, provide the following information for wells within a three-mile radius of the site:

   a) The current use(s) of groundwater from wells that draw from the aquifer(s) (e.g., drinking water, irrigation, industrial process water, etc.).

   b) The distances to the nearest well and nearest drinking water well that draws from the aquifer(s).

   c) The direction and velocity of flow within the aquifer(s).

   d) The approximate number of service connections and population served by drinking water wells from the aquifer(s).

Potential data sources: local water districts and utilities; county planning and health departments; local irrigation districts; SWRCB DDW; DWR; U.S. Geological Service (USGS); the local RWQCB.

4) Describe the possible migration route(s) from the areas of hazardous substance contamination and/or storage to nearby surface waters, marshlands, wetlands, or wildlife habitats in the event of surface water runoff or flooding.

Potential data sources: Personal observation; aerial photographs; USGS Maps.
5) Describe the locations and uses of surface waters, marshlands, wetlands, and wildlife habitats which may be potentially affected by migration of contaminants from the site. Provide the location and distance to the nearest surface water, marshland, wetland, and wildlife habitat which may be affected by migration of the contaminants. Also describe the relationship of the site to potential impacts from future sea level rise.

Potential data sources: USGS maps; other maps; California Department of Fish and Wildlife (DFW); local planning department; U.S. Bureau of Reclamation; State Water Resources Control Board (SWRCB); San Francisco Bay Conservation and Development Commission; California Coastal Commission.

6) Describe any past or existing measures for preventing or mitigating surface water runoff from the site (e.g., berms, diversion systems, diking, sealed containers for hazardous substances, runoff collection systems, etc.).

Potential data sources: Facility records; DTSC files; RWQCB files; other agencies.

7) Identify the approximate population served (number of people drinking water) by each surface water intake within three (stream) miles downstream of the probable point of entry of runoff from a site to a stream/river and one mile from the probable point of entry to a static body of water. Also identify the approximate number of acres of food/forage cropland irrigated by water from each intake and the approximate number of livestock or poultry which consume water from each intake.

Potential data sources: U.S. Census Bureau; local/regional planning or health departments; SWRCB DDW; local irrigation district; DWR.

8) Provide the approximate slope (in percentage) of the site and the intervening terrain between the site and any surface water which may potentially accept runoff.

3.2.6.4 FACTORS RELATED TO AIR PATHWAYS

Information for this section should be provided only if sampling data exist to document a release of a hazardous substance/material to the atmosphere or if the threat of a release exists. If there are data indicating an on-going release to the atmosphere, the local Air Quality Management District (AQMD) should be notified. If there is evidence that a hazardous substance/material has been historically released to the atmosphere or that a hazardous substance/material has been released to surface soil, the possibility exists that surface soil could be a reservoir for atmospheric contamination. Contaminated surface soils are subject to wind dispersal, evaporation, and dispersal from fire/explosion. If a release has been documented or a threatened release exists at the site, provide the following information.

1) Describe the known or potential sources(s) and mechanism for the release or threatened release.
Potential data sources: Site records; local AQMD.

2) Provide the daily prevailing wind direction and daily average wind velocity for the site.

Potential data sources: Local air district; local weather stations; National Oceanic and Atmospheric Administration (NOAA).

3) Describe local climatic factors (e.g., seasonal temperatures, seasonal precipitation, seasonal temperature inversions, seasonal wind patterns, and seasonal extreme events).

Potential data sources: Local AQMDs; local weather stations; NOAA.

4) Describe the timing of the release or threatened release (e.g., intermittent release related to facility operation, continuous release from an impoundment, potential release if heavy machines disturb soils, etc.).

Potential data sources: Facility records; local AQMDs.

5) Describe the possible dispersion route(s) for a release or threatened release (e.g., via a stack emission, evaporation, wind, fire/explosion, etc.).

Potential data sources: Local AQMDs; facility records.

6) Provide the approximate population of residents and workers which may be affected by a release or threatened release of hazardous substances/materials.

Potential data sources: U.S. Census Bureau; local/regional planning databases.

7) Provide the location and distance from the site to any of the following areas which may be impacted by a release or threatened release of hazardous substances/materials:

- Residential areas and schools;
- Commercial/industrial zones;
- National/state parks, forests, wildlife reserves;
- Agricultural lands (in production within five years) for both prime and non-prime agricultural land;
- Archeological and paleontological sites (California Public Resources Code § 5097.5); and,
- Cultural/historic/landmark sites.

Potential data sources: local planning departments; Department of Food and Agriculture; DWR; Department of Forestry; Department of Parks and Recreation; Native American Heritage Commission (HAHC); Office of Historic Preservation (OHP); maps.
8) If not previously indicated in other sections of the PEA report, provide the type, location, and distance from the release or threatened release of hazardous substances/materials to the following sensitive environments:

- Schools
- Day care centers
- Hospitals
- Nursing homes
- Retirement communities
- Locations of any other sensitive populations
- Coastal wetlands (within a two-mile radius);
- Fresh-water wetlands (within a one-mile radius);
- Habitat for special species (within a one-mile radius); and,
- National parks or preserves.

Potential data sources: local planning department, maps, DFW NDDB, DWR, SWRCB, physical measurement.

3.2.7 SAMPLING ACTIVITIES AND RESULTS

In the three subsections that follow, the report should summarize the sampling activities performed, present the analytical data, and provide a discussion of the results.

3.2.7.1 SUMMARY OF ACTIVITIES

The sampling plan provided a framework for field activities and allowed flexibility for some decisions to be made in the field. This section should describe the activities that were performed; document decisions made in the field; identify any deviations from the work plan; and provide explanations for any deviation.

3.2.7.2 PRESENTATION OF DATA

Use tables, charts, etc. to summarize the sample analysis results for each medium. At a minimum the information presented should include the chemical name, sample type, sample designation, sample location, sample depth (if appropriate), detection limit, units, and date collected. Analysis results as reported from the laboratory, including quality assurance/quality control (QA/QC) data, should be provided in an appendix to the report. Also include information regarding the handling of analytical samples from the time of collection until final analysis.

3.2.7.3 DISCUSSION OF ANALYTICAL RESULTS

Provide a summary of the conclusions reached upon evaluation of the analytical data. Identify unexpected or conflicting results, unusable data, and field and/or laboratory interferences and provide potential rationale. Appropriate figures or tables should be used to support the discussion. This section should also identify secondary analysis
performed to confirm original results that may have been questionable. Any hot spots, (i.e., areas of elevated concentrations), areas of special concern and/or separate areas of contamination present at the site should be discussed.

3.2.8 HUMAN HEALTH SCREENING EVALUATION

The introduction to the human health screening evaluation should contain a brief summary of the information presented in the remainder of the section. The summary should introduce the four components of the human health screening evaluation: exposure pathways, exposure concentrations of chemicals of concern, toxicity values, and risk characterization.

3.2.8.1 EXPOSURE PATHWAYS AND MEDIA OF CONCERN

Refer to the conceptual site model (CSM) in Section 3.2.6.1 to show potentially complete exposure pathways (See Figure 2.1 for example). If there are several distinct areas of contamination, presentation of separate CSMs for each area may be necessary. If the pathways of exposure are the same for each area, then one CSM is sufficient; however, a statement to that fact should be included. A statement should be included supporting the approach that the default exposure pathways embedded in the screening levels, as described in Section 2.5.2.1, can be considered complete and reasonable to assume at the site.

3.2.8.2 EXPOSURE CONCENTRATIONS AND CHEMICALS

Include tables identifying the chemicals of concern, their physical constants, and the concentrations in each medium that were used as input for the screening evaluation (this should be displayed for each separate area of contamination). Every table should have a descriptive title name and the name of the potentially contaminated area it represents, if applicable. If the site has historic sampling data, significant results should be included in separate, chronological tables with each table clearly noting the sampling date. If there are large volumes of data, include only the significant findings in this section and include all other data in an appendix. Provide the rationale if a particular chemical is to be excluded from evaluation. All background data should be included in this section, with any suspected anomalies noted. A table can be used to compare metals found on site with local background levels. A table may be included comparing ambient levels for selected organic chemicals, if appropriate.

3.2.8.3 HUMAN HEALTH SCREENING LEVELS

Include a table of the human health screening levels for residential land use used to perform the human health screening evaluation. This table should include the source of the screening level, the units of measurement, and the environmental medium to which the screening level should be compared. The environmental media to be considered are soil, soil vapor, groundwater, and surface water (if used as a drinking water source). Screening levels for soil are generally the USEPA RSLs with modifications described in
the most current DTSC HHRA Note 3\textsuperscript{71}. The source of screening levels for groundwater for risk evaluation may be the USEPA tap water RSLs or the California Public Health Goals (PHGs). California Maximum Contaminant Levels (MCLs) and water quality objectives of basin plans are not all strictly risk-based, but they may be potential requirements for site cleanup. Screening levels for indoor air are the air RSLs, which are compared to indoor air levels calculated from soil vapor and/or groundwater concentrations as described in Sections 2.5.4.5.3 and 2.5.4.5.4. The units of measurement are mg/kg for soil, mg/m\textsuperscript{3} or µg/m\textsuperscript{3} for soil gas and indoor air, and µg/L or mg/L for groundwater. The table should identify each chemical as being evaluated as a carcinogen, non-carcinogen, or both.

3.2.8.4 TOXICITY VALUES

Toxicity values are embedded in the derivation of the screening levels for specific chemicals. If screening levels are not used in the human health screening evaluation, and the equations based on the USEPA Risk Assessment Guidance for Superfund (RAGS) are used instead, as described in Section 2.5.4, each chemical of concern should have all relevant and significant human toxicity information described. This should include a summary table with the cancer potency factor, reference dose and reference concentration for each chemical of concern, and for each route of exposure. The table should cite the source and date of the toxicity values (e.g., Cal/EPA, USEPA). Toxicity data for each route can be displayed in a table. This section should clearly indicate which toxicity values are based on cross-route extrapolation.

3.2.8.5 RISK CHARACTERIZATION SUMMARY

Include two tables comparing the maximum concentration of each chemical of concern to its appropriate screening level, as described in Section 2.5.3. One table should list the comparison of chemicals considered carcinogens, and the other table should list the comparison of chemicals considered non-carcinogens. The summed ratio for carcinogens, multiplied by 10\textsuperscript{6}, should be included in the carcinogenic chemicals table representing the cumulative risk from all carcinogens detected at the site. The summed ratio for non-carcinogens representing the cumulative HI for the site should be included on the non-carcinogens table. Conclusions regarding the screening evaluation determination should be provided in this summary.

The risk and hazard estimates which result from application of this screening evaluation do not represent absolute estimates at a specific site, because generic assumptions for residential land use are used. The information provided for the PEA screening evaluation is often based on limited sampling information. The goal of the PEA screening evaluation is to ensure that no potential health hazard is overlooked; therefore, the screening evaluation's assumptions and default values are restricted to a reasonable maximum exposure (RME) scenario.

\textsuperscript{71} DTSC Human Health Risk resources page contains Note 3. Web site. [http://www.dtsc.ca.gov/AssessingRisk/humanrisk2.cfm#guidance](http://www.dtsc.ca.gov/AssessingRisk/humanrisk2.cfm#guidance)
3.2.9 ECOLOGICAL SCREENING EVALUATION

The introduction to the ecological risk assessment should contain a summary of the information presented in this section of the PEA Report.

3.2.9.1 SITE CHARACTERIZATION

Identify the chemicals of ecological concern to biota and provide information on habitat-specificity of contamination.

3.2.9.2 BIOLOGICAL CHARACTERIZATION

List and describe all wildlife habitats potentially affected by the site. The nature of the habitat should be detailed including cyclic changes. The rationale for excluding any nearby wildlife habitat from evaluation should be provided.

List all special species potentially affected by the site and identify any endangered or special status species. State if any of these species have been observed on the site. Note if a species is particularly sensitive to any chemicals of concern found on site.

Persons performing biological surveys should be identified, along with their credentials.

3.2.9.3 PATHWAY ASSESSMENT

Describe the onsite contamination and the exposure pathways for which there may be contact between biota and chemicals of concern in any medium. Use a CSM to illustrate general potential exposure pathways, then a more detailed exposure pathway analysis table can be used for each habitat. Include a discussion on whether this exposure is onsite or offsite and describe the potentially affected species. Any past documented or observed impacts to wildlife habitats or special species from the site should be described in this section. Also, describe any interim remedial measures that may abate potential impacts to the environment from the chemicals of concern.

3.2.9.4 QUALITATIVE SUMMARY

Provide a qualitative description of the magnitude, duration, and frequency of exposure for the various biological receptors, representing multiple trophic levels, for each contaminant and area of contamination. A site-wide habitat map and maps showing historical and current land use should be included. Conclusions regarding current or potential environmental impacts should be included. If the site contamination does not affect biota, a qualitative statement to that effect and supporting rationale should be provided. If the site contamination has the potential or can be reasonably assumed to affect wildlife or wildlife habitats onsite or offsite, further investigation and assessment may be necessary.
3.2.10 COMMUNITY PROFILE

This section should be a summary of the public participation activities conducted as part of the PEA investigation. The summary should highlight the assessment of community concerns and the public participation actions taken. Also, include any recommendations for future public participation activities, if any.

3.2.11 OPINION OF ENVIRONMENTAL PROFESSIONAL (REQUIRED BY AAI)

For PEAs that include AAI requirements, the Environmental Professional’s opinion(s) as to whether the inquiry identified conditions indicative of releases or threatened releases of hazardous substances on, at, in, or to the subject property must be included (see final rule at 40 CFR §312.21(c)(1)) The Environmental Professional also must include an opinion regarding additional appropriate investigation to detect the presence of contamination at the property, if the Environmental Professional has such an opinion.

3.2.12 CONCLUSIONS AND RECOMMENDATIONS

3.2.12.1 SUMMARY AND CONCLUSIONS

The conclusions of the PEA report need to address three main questions:

- Have current or past practices of handling hazardous waste/substances/materials resulted in a release or threat of release at the site?
- If a release has occurred or a threatened release exists, does it pose a significant threat to public health or the environment?
- Does the release pose an immediate potential hazard to public health or the environment which would require the implementation of an expedited response action?

In answering the above questions, the conclusions should be specific, concise, and supported by information presented in the body of the report. All conclusions presented in this section must be consistent with the data and analysis presented elsewhere in the PEA report.

If a release or threatened release does not exist, this section should include a statement to that effect and reference the information contained in the body of the report which supports the statement.

3.2.12.2 RECOMMENDATIONS

Based on the conclusions presented in the previous section, the Environmental Professional will make a recommendation(s) regarding the need for further action at the
site. In its simplest form the recommendation will either be "no further action (NFA)" or "additional action required".

A NFA recommendation can be made in cases when no release of hazardous substances/materials has occurred and in cases when levels of contamination are determined to be insignificant. Any recommendations for NFA at sites where a release has been documented must be supported by information provided in the human health and environmental threat evaluation portion of the report. If the human health and environmental threat evaluation is based upon exposure scenarios other than an unrestricted use, restrictions on the use of the property should be discussed with the DTSC project manager.

At sites with significant contamination, a recommendation for further action to investigate or remediate the site must be made. This recommendation should not simply state that "further action is required". The recommendation should identify additional investigation and/or remediation needs and strategies to address them.

In addition to the recommendations above for long term actions, this section must include recommendations for expedited response actions necessary to mitigate any immediate potential hazards to public health or the environment. These actions can take a number of forms, including but not limited to: removing highly contaminated soils to prevent further migration; placing a polymer coating onto soils to prevent dispersion and runoff; placing a fence and warning signs around contaminated areas to prevent direct contact; and/or providing alternative drinking water sources to residents near sites where drinking water supplies are contaminated. When determining if expedited response actions are required, consider the following:

- Does the site have unrestricted access?
- Are there hazardous substances in surface impoundments, unsealed or improper containers, piles, leaking tanks, or other unapproved storage?
- Have the substances been spilled on the ground or other surfaces accessible to humans or animals?
- Does the toxicity of the hazardous substances at the site pose an immediate public health or environmental endangerment?
- Are unsafe levels of soil vapor migrating or have the potential to migrate into indoor air?
- What is the most immediate exposure threat facing nearby populations?
- How many people live or work around the site and what is the distance of that population from the site?
• Is there a confirmed instance in which exposure to hazardous substances/materials at a site has caused injury, illness, or death to humans, domestic or wild animals, or plants?

• Can it reasonably be inferred from the geology and hydrology of the site and surrounding area and the nature of the contaminants that there is the potential for offsite migration?

• Is there evidence of offsite migration?

• Are there active wells in the suspected pathway of migration?

• Is there a potential for the contaminant to become airborne?

• Can a reasonable inference be made that taking an immediate action could significantly reduce continued or potential hazardous substance migration from the site through air emissions, surface water runoff, groundwater migration, or subsurface gas migration?

3.2.12.3 DATA GAPS (REQUIRED BY AAI)

As required in 40 CFR §312.21(c)(2) of the final rule, the report should document and discuss significant data gaps that affect the ability of the Environmental Professional to identify conditions indicative of releases or threatened releases.

3.2.12.4 PRELIMINARY SCOPING RECOMMENDATIONS

For sites that will continue in the cleanup process, the next step after completing the PEA is the Remedial Investigation/Feasibility Study (RI/FS). The RI is conducted to characterize the full extent of contamination at the site and to obtain information needed to identify, evaluate, and select cleanup alternatives. The FS includes an analysis of remediation alternatives based on the nine National Contingency Plan evaluation criteria (USEPA, 1988).

The first step of the RI/FS is the planning or scoping of the project to focus activities and streamline the process, thereby preventing needless expenditures and loss of time in unnecessary sampling and analysis. Ideally, all sites requiring further action would begin the RI/FS immediately upon completion of the PEA. This section includes steps to scope the RI/FS upon completion of the PEA. These steps will serve to identify potential data gaps, keep information on site conditions current, and help establish priorities for future remedial actions. Upon approval of the PEA report, the parties responsible for the site should initiate the implementation of the scoping activities identified in the report.

Specific activities that may be conducted during project scoping include:

• Evaluating the PEA data to update the CSM and identify data gaps.
- Initiating limited field investigations if available data are inadequate to develop an updated CSM and adequately scope the project. An example of limited field investigation would be installation of monitoring wells and/or collecting samples from existing wells on a quarterly basis to monitor for the chemicals of concern or conduct hydrological studies.

- Identifying preliminary remedial action objectives (RAOs) and likely response actions for the specific projects, including presumptive remedies. This may include identifying the need and a schedule for treatability studies to better evaluate potential remedial alternatives.

- Conducting treatability studies identified in scoping.

Full project scoping activities can be found in the USEPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA, 1988). Potential scoping needs applicable to baseline risk assessment data collection can be found in USEPA's *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)* (USEPA, 1989a). DTSC's Proven Technologies and Remedies documents are also available and are designed to help streamline remedy selection and site cleanup while ensuring full protection of public health, safety and the environment without diminishing public input. These documents are available on DTSC's web site at [http://www.dtsc.ca.gov/SiteCleanup/PTandR.cfm](http://www.dtsc.ca.gov/SiteCleanup/PTandR.cfm), and are intended to be one of many options that may be used in the cleanup process and are not necessarily applicable to every site.

### 3.2.13 SIGNATURE(S) AND QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONAL(S), INCLUDING STATEMENTS (REQUIRED BY AAI)

Geologic or engineering plans, specifications, drawings, and reports must be prepared by, or under the direct supervision of a California professional geologist or civil engineer, as appropriate, who will review and sign all such documents indicating responsibility for their content. The signature(s) of the Environmental Professional(s) and the statements as required by 40 CFR §312.21(d) need to be included if an AAI is being conducted.
GLOSSARY

CALIFORNIA HUMAN HEALTH SCREENING LEVELS (CHHSLs). CHHSLs were developed by the Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) in 2005 using California toxicity criteria, assuming default exposure pathways and default conservative exposure parameters. CHHSLs are not generally recommended for use in a PEA evaluation, because they are not reviewed and revised on a regular basis. Consult with a DTSC toxicologist for further information.

COMMUNITY ASSESSMENT. A series of interviews with local community members which will aid in characterizing and determining the informational needs and desires of the community.

COMMUNITY PROFILE. A written presentation of information gathered through the community assessment regarding community concerns that form the basis for determining public notification and public participation needs.

CONCEPTUAL SITE MODEL (CSM). A "model" of a site developed at scoping using readily available information. In its simplest form, the CSM identifies all potential or suspected sources of contamination, types and concentrations of contaminants detected at the site, potentially contaminated media, and potential exposure pathways, including receptors.

EXPEDITED RESPONSE ACTION. A removal action which occurs during or soon after the site evaluation phase. These removals generally consist of removing leaking drums/tanks, fencing the site, and placing caps of protective covering over known areas of contamination. Also known as: interim remedial measures (IRMs), time-critical removal actions (TCRAs), or non-time-critical removal actions.

EXPOSURE POINT. A location of potential contact between an organism (or receptor) and a chemical or physical agent. (USEPA, 1991)

EXPOSURE ROUTE. The way a chemical or physical agent comes in contact with an organism (i.e., by ingestion, inhalation, dermal contact). (USEPA, 1991)

FIELD DUPLICATES. Independent samples which are collected as close as possible to the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently. These duplicates are useful in documenting the precision of the sampling process. (USEPA, 1986)

HAZARD INDEX (HI). The sum of two or more hazard quotients (HQs) for multiple substances and/or multiple exposure pathways. (USEPA, 1991)

HAZARD QUOTIENT (HQ). The ratio of a single substance exposure level over a specified time period to a reference dose for that substance derived from a similar exposure period. (USEPA, 1991)
**INHALATION UNIT RISK (IUR).** The upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 µg/m³ in air.

**QUANTITATION LIMIT.** The lowest level at which a chemical can be accurately and reproducibly quantitated. Usually equal to the instrument detection limit multiplied by a factor of three to five, but varies for different chemicals and different samples. (USEPA, 1991)

**REFERENCE CONCENTRATION (RfC).** An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of adverse non-cancer effects during a lifetime. Expressed as a concentration of contaminant in air (mg/m³). (Adapted from IRIS database)

**REFERENCE DOSE (RfD).** An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of adverse non-cancer effects during a lifetime. Expressed in mg/kg of body weight per day. (Adapted from IRIS database)

**REGIONAL SCREENING LEVELS (RSLs).** Initial screening levels that are protective of human health. RSLs are used in the screening level human health evaluation. RSLs were developed by the USEPA using toxicity criteria derived by the USEPA, assuming default exposure pathways and default conservative exposure parameters. They are reviewed and revised at least twice a year.

**REMEDIAL ACTION.** (a) Those actions which are consistent with a permanent remedy, that are taken instead of, or in addition to, removal actions in the event of a release or threatened release of a hazardous substance into the environment. (Adapted from California Health and Safety Code, Division 20, Chapter 6.8) (b) Those actions which are necessary to monitor, assess, and evaluate a release or a threatened release of a hazardous substance. (Adapted from California Health and Safety Code, Division 20, Chapter 6.8)

**REMOVAL (ACTION).** Includes the cleanup or removal of released hazardous substances from the environment or the taking of other actions as may be necessary to prevent, minimize, or mitigate damage which may otherwise result from a release or threatened release. (Adapted from California Health and Safety Code, Division 20, Chapter 6.8)

**SLOPE FACTOR (SF).** A plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. The slope factor is used to estimate an upper-bound probability of an individual developing cancer as a result of a lifetime of exposure at a particular level of a potential carcinogen. (USEPA, 1991)
**SPLIT SAMPLES.** Aliquots of a sample taken from the same container and analyzed independently. These are usually taken after homogenizing the sample and are used to document intra- or inter-laboratory precision. (USEPA, 1986)

**VADOSE ZONE.** The unsaturated zone between the land surface and the water table.
REFERENCES


OEHHA. 2005. Human-Exposure-Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil, January.


APPENDIX A
### TABLE 1 SCREENING LEVEL DERMAL ABSORPTION FRACTIONS (ABS) FROM SOIL

<table>
<thead>
<tr>
<th>Compound Class</th>
<th>Absorption Fraction(^1)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorinated Insecticides</td>
<td>0.05</td>
<td>Wester, et al., 1990a; Wester, et al., 1992a</td>
</tr>
<tr>
<td>Polynuclear Aromatic Hydrocarbons</td>
<td>0.15</td>
<td>Wester, et al., 1990a</td>
</tr>
<tr>
<td>Organophosphates</td>
<td>0.25</td>
<td>Cal/EPA Office of Environmental Health Hazard Assessment</td>
</tr>
<tr>
<td>Pentachlorophenol</td>
<td>0.25</td>
<td>Wester, et al., 1993b</td>
</tr>
<tr>
<td>Polychlorinated Dibenzo-p-dioxins and Dibenzofurans</td>
<td>0.03</td>
<td>USEPA, 1992</td>
</tr>
<tr>
<td>Polychlorinated Biphenyls (PCB)</td>
<td>0.15</td>
<td>Wester, et al., 1993c</td>
</tr>
<tr>
<td>Other Organic Chemicals</td>
<td>0.10</td>
<td>SCAQMD, 1988</td>
</tr>
<tr>
<td>Cadmium</td>
<td>0.001</td>
<td>Wester, et al., 1992b</td>
</tr>
<tr>
<td>Arsenic</td>
<td>0.03</td>
<td>Wester, et al., 1993a</td>
</tr>
<tr>
<td>Hexavalent Chromium</td>
<td>0%</td>
<td>Not shown to be a systemic carcinogen via dermal exposure</td>
</tr>
<tr>
<td>Other metals and complexed cyanides</td>
<td>0.01</td>
<td>SCAQMD, 1988</td>
</tr>
<tr>
<td>Free Cyanide</td>
<td>0.10</td>
<td>SCAQMD, 1988</td>
</tr>
</tbody>
</table>

\(^1\) Dermal absorption values from soil are based on, in order of preference: *in vivo*, animal studies on dermal absorption from soil; *in vivo*, animal studies on dermal absorption from an applicable cosolvent; *in vitro*, human skin dermal absorption studies; *in vitro* animal skin dermal absorption studies. Actual dermal absorption from soil may vary from these estimates due to exposure conditions or soil characteristics which differ from the experimental conditions.
### TABLE 2  SAMPLE EXPOSURE PATHWAY ANALYSIS FOR AN ECOLOGICAL SCREENING EVALUATION

<table>
<thead>
<tr>
<th>Habitat Type&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Potential Contaminants or Classes of Contaminants of Concern&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Contaminated Media&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Food Web Exposure&lt;sup&gt;4&lt;/sup&gt;</th>
<th>Potential Exposure Pathway&lt;sup&gt;5&lt;/sup&gt;</th>
<th>Complete Exposure Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chaparral</td>
<td>DDT</td>
<td>Soil</td>
<td>Direct Ingestion</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DDT</td>
<td>Soil</td>
<td>Invertebrates to Mouse</td>
<td>Ingestion of Prey</td>
<td>Yes</td>
</tr>
<tr>
<td>Chloroform</td>
<td>Groundwater</td>
<td></td>
<td>Inhalation of Soil Gases</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Chloroform</td>
<td>Groundwater</td>
<td></td>
<td>Direct Ingestion</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> Examples of habitat types include freshwater wetland, conifer forest, oak woodland and riparian.

<sup>2</sup> Indicate the specific chemical or family of chemicals, based on potential significance to the risk assessment. Physical or chemical properties such as volatility, bioaccumulative potential, tendency to sorb to soils or sediments and water solubility may be important.

<sup>3</sup> Indicate the food web transfers for those indirect exposures through the food web.

<sup>4</sup> Indicate the potential exposure pathway such as inhalation of volatile compounds from surface or subsurface contamination, incidental soil or sediment ingestion, ingestion of contaminated food items, or dermal contact with contaminated media.

<sup>5</sup> Indicate whether the potential exposure pathway is complete given site-specific characteristics.
Disclaimer: The information and data contained in this document are for planning purposes only and should not be relied upon for final design of any project. Any information in this Transportation Concept Report (TCR) is subject to modification as conditions change and new information is obtained. Although planning information is dynamic and continually changing, the District 3 Office of System and Freight Planning makes every effort to ensure the accuracy and timeliness of the information contained in the TCR. The information in the TCR does not constitute a standard, specification, or regulation, nor is it intended to address design policies and procedures.

California Department of Transportation

Provide a safe, sustainable, integrated and efficient transportation system to enhance California’s economy and livability

Approvals:

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District 3 Deputy Director
Planning and Local Assistance

Date: 7/12/14

John Rodrigues
 Acting District 3 Director

Date: 7/24/14
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Further Transportation Concept Report Information:
Caltrans District 3 Website - http://www.dot.ca.gov/dist3/departments/planning
(Select System and Freight Planning, then Transportation Concept Reports)
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ABOUT THE TRANSPORTATION CONCEPT REPORT

System Planning is the long-range transportation planning process for the California Department of Transportation (Caltrans). The System Planning process fulfills Caltrans’ statutory responsibility as owner/operator of the State Highway System (SHS) (Gov. Code §65086) by evaluating conditions and proposing enhancements to the SHS. Through System Planning, Caltrans focuses on developing an integrated multimodal transportation system that meets Caltrans’ goals of safety, mobility, delivery, stewardship, and service.

The System Planning process is primarily composed of four parts: the District System Management and Development Plan (DSMDP), the Transportation Concept Report (TCR), Corridor System Management Plan (CSMP), and the DSMDP Project List. The district-wide DSMDP is strategic policy and planning document that focuses on maintaining, operating, managing, and developing the transportation system. The TCR is a planning document that identifies the existing and future route conditions as well as future needs for each route on the SHS. The CSMP is a complex, multi-jurisdictional planning document that identifies future needs within corridors experiencing or expected to experience high levels of congestion. The CSMP serves as a TCR for segments included within the CSMP. The DSMDP Project List is a list of planned and partially programmed transportation projects used to recommend projects for funding. These System Planning products are also intended as resources for stakeholders, the public, and partner, regional, and local agencies.

STAKEHOLDER PARTICIPATION

Stakeholder participation was sought throughout the development of the State Route (SR) 113 TCR. Outreach involved internal and external stakeholders, regional and local agencies. During the initial information resource gathering for the TCR, stakeholders were contacted for initial input related to their particular specializations, and to verify data sources used and data accuracy. As the document was finalized, stakeholders were asked to review the document for comments, edits, and for consistency with the intent of existing plans, policies, and procedures. Written comments were received and incorporated into the final document. The process of including and working closely with stakeholders adds value to the TCR, allows for outside input and ideas to be reflected in the document, and helps strengthen public support and trust.

STATE AND LOCAL RESPONSIBILITY

Improvements to the SHS are the responsibility of both Caltrans and local agencies. Developments that add cumulative impacts to this route and the regional State Highway System may necessitate that local jurisdictions provide nexus based, proportional fair-share funding for future highway improvements. Developments or local circulation changes that will have significant traffic impacts to the highway should provide improvements to mitigate those impacts.
EXECUTIVE SUMMARY

State Route (SR) 113 within District 3 is a north-south route that extends 38.3 miles from Interstate 80 (I-80), near the City of Davis, to the SR 99/SR 113 junction, 10 miles south of Yuba City. The majority of the route is classified as a two-lane conventional highway, except for the portion of the route between Davis and Woodland, which is a four-lane freeway. Outside of the urbanized areas of Davis and Woodland, and the rural communities of Knights Landing and Robbins, the route primarily crosses agricultural land uses. SR 113 serves as an important crosslink within Yolo and Sutter County because of trucking and commuter traffic that use the route as a connection to major SHS routes.

Concept Summary

The SR 113 TCR evaluates current traffic conditions along the route by using 2014 as a base year and projected growth along the route within a 20-year planning horizon (2034). This document is broken down into 4 segments. Table 1 provides a summary of the existing facility, build facility (20-year concept), and ultimate facility (post-20 year concept) for SR 113. The build facility scenario is the existing facility plus planned and programmed SHS projects with future traffic volumes. The ultimate facility is the facility needed to meet the concept Level of Service (LOS) standards for the route.

<table>
<thead>
<tr>
<th>Segment #</th>
<th>Segment Description</th>
<th>Existing Facility</th>
<th>Build Facility</th>
<th>Ultimate Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I-80 at the Solano/Yolo County line to I-5 in the City of Woodland.</td>
<td>4F</td>
<td>4F, Maintenance, and freeway-to-freeway connection improvements</td>
<td>4F, Bike/Pedestrian Improvements, Maintenance, and Interchange Improvements</td>
</tr>
<tr>
<td>2</td>
<td>SR 113/I-5 northbound off-ramp at East Street in the City of Woodland to Knights Landing</td>
<td>2C</td>
<td>2C and Maintenance</td>
<td>2C, Bike/Pedestrian Improvements, and Maintenance</td>
</tr>
<tr>
<td>3</td>
<td>Knights Landing to Yolo/Sutter County Line</td>
<td>2C</td>
<td>2C and Maintenance</td>
<td>2C, Bike/Pedestrian Improvements, and Maintenance</td>
</tr>
<tr>
<td>4</td>
<td>Yolo/Sutter County Line to SR 99</td>
<td>2C</td>
<td>2C, Maintenance, and New Interchange Connection</td>
<td>2C, Bike/Pedestrian Improvements, and Maintenance</td>
</tr>
</tbody>
</table>

Note: F = Freeway, C = conventional

Concept Rationale

Caltrans District 3 Concept Rationale is based on the concept Level of Service (LOS) standards for acceptability in rural, urban clusters, and urbanized areas. Traditionally, concept LOS has been used in Caltrans TCRs to reflect the minimum level or quality of operations acceptable for each route segment within the 20-year planning period. District 3 LOS standards are as follow: LOS D in rural areas (population less than 2,500), LOS E in urban cluster (population 2,500 to 49,999), and LOS E urbanized areas (population over 50,000). There is no significant growth expected in the next 20 years. However, improvements as identified below are essential to providing and maintaining a sustainable, safe, integrated, and efficient transportation system that will enhance California’s economy and livability.
Proposed Projects and Strategies

There are three projects identified that will affect capacity along SR 113: I-5/SR 113 Connector Phase 2 (planned), I-5/SR 113 Interchange (planned) and the SR 99/113 Interchange (currently in construction).

The I-5/SR 113 projects are part of a new interchange and freeway-to-freeway connection for north and southbound traffic. These projects will help improve the interconnection between I-5 and SR 113, which has become more significantly deficient over recent years. Both of these projects are currently in the “planned” phase with an estimated completion date of 2026 for the I-5/SR 113 Connector Phase 2 and an estimated completion date of 2035 for the I-5/SR 113 Interchange. Only the I-5/SR 113 Connector Phase 2 project is scheduled to be completed within the 20-year horizon period.

The SR 99/113 Interchange project is the only project currently in construction. The interchange is intended to improve the efficiency and safety conditions as vehicles merge onto SR 99 or SR 113. The project is planned to be completed in the summer of 2014.

Other proposed projects along the routes include ADA improvements, pavement rehab, and minor changes at intersections (i.e. turn lanes). These projects do not affect SR 113 capacity, but they do provide necessary maintenance upgrades for vehicles and facility upgrades for alternative modes of transportation.

The goal of Caltrans is to work with local agencies in order to meet the Concept Rationale for the route segments through feasible project enhancement/development, and/or Intelligent Transportation Systems (ITS) and operational improvements, which is consistent with the Caltrans’ goal of improving mobility through System Management strategies. Proposed projects and strategies are listed in Tables 13 and 14 on pages 18 and 19.

CORRIDOR OVERVIEW

ROUTE SEGMENTATION

For the purpose of analysis, SR 113 is divided into four segments. These segments are identified in Table 2 and illustrated in Figure 1. In-between Segment 1 and Segment 2 there is a small break in route because of I-5.

<table>
<thead>
<tr>
<th>Segment #</th>
<th>Location Description</th>
<th>County, Route, Beginning Postmile (PM)*</th>
<th>County, Route, End PM*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I-80 at the Solano/Yolo County line to I-5 in the City of Woodland.</td>
<td>YOLO_R0.0</td>
<td>YOLO_R11.14</td>
</tr>
<tr>
<td>2</td>
<td>SR 113/I-5 northbound off-ramp at East Street in the City of Woodland to Knights Landing</td>
<td>YOLO_11.296</td>
<td>YOLO_M21.20</td>
</tr>
<tr>
<td>3</td>
<td>Knights Landing to Yolo/Sutter County Line</td>
<td>YOLO_M21.20</td>
<td>YOLO_22.08</td>
</tr>
<tr>
<td>4</td>
<td>Yolo/Sutter County Line to SR 99</td>
<td>SUT_0.00</td>
<td>SUT_16.38</td>
</tr>
</tbody>
</table>

*Beginning and end post miles for each segment are derived from the Caltrans Transportation System Network (TSN) Highway Sequence Listing using route breaks and district, county, and urban/rural boundaries.

ROUTE DESCRIPTION

SR 113 is not a major SHS route, but it does serve as an important crosslink in the SHS for the commuter and commercial traffic within the region. It is a north-south route that begins at the southern edge of Yolo County, near the City of Davis and the University of California, Davis (UC Davis) campus, and ends at the SR 99 Junction in Sutter County. The route is primarily a two-lane conventional highway that crosses agricultural fields, except for an 11.14 mile stretch that is a four-lane freeway.
The freeway section of SR 113 (Segment 1) is used frequently by commuters because it is the primary connection between I-5 and I-80, as well as the urbanized communities of Davis and Woodland. Because of this, traffic volumes are highest along this portion of the route, especially during peak hours and in times of delay along either I-5 or I-80. More frequently, in times of delay along the I-80 causeway SR 113 has been used as an alternative route across the Yolo Bypass overflow channel.

North of Woodland (Segments 2-4), the route is a two-lane conventional highway that crosses agricultural fields and the rural communities of Knights Landing and Robbins as it traverses towards the SR 99 Junction. These agricultural areas have historically been and continue to be a main contributor to each county’s economic base and produce some of the highest truck volumes in the region. In addition to trucking, commuters sometimes travel through the rural portion of the route as an alternative to SR 99 for connection to the San Francisco Bay Area and the more rural communities located north of the Sacramento area. A complete breakdown of each segment’s designation and characteristics is identified in Table 2 below.

### Table 3: SR 113 Route Designations and Characteristics

<table>
<thead>
<tr>
<th>Segment #</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freeway &amp; Expressway²</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>National Highway System³</td>
<td>MAP-21 Principal Arterial</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Strategic Highway Network</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Scenic Highway⁴</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Interregional Road System⁵</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>High Emphasis⁶</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Focus Route⁷</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Federal Functional Classification⁸</td>
<td>Other Freeway or Expressway</td>
<td>Major Collector</td>
<td>Minor Arterial</td>
<td>Minor Arterial</td>
</tr>
<tr>
<td>Goods Movement Route</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Truck Designation⁹</td>
<td>Terminal Access (STAA)</td>
<td>Terminal Access (STAA)</td>
<td>Terminal Access (STAA)</td>
<td>Terminal Access (STAA)</td>
</tr>
<tr>
<td>Rural/Urban/Urbanized¹⁰</td>
<td>Urbanized</td>
<td>Rural</td>
<td>Rural</td>
<td>Rural</td>
</tr>
<tr>
<td>Metropolitan Planning Organization¹¹</td>
<td>SACOG</td>
<td>SACOG</td>
<td>SACOG</td>
<td>SACOG</td>
</tr>
<tr>
<td>Regional Transportation Planning Agency¹²</td>
<td>SACOG</td>
<td>SACOG</td>
<td>SACOG</td>
<td>SACOG</td>
</tr>
<tr>
<td>Congestion Management Agency</td>
<td>Yolo County Transportation District</td>
<td>Yolo County Transportation District</td>
<td>Yolo County Transportation District</td>
<td>N/A</td>
</tr>
<tr>
<td>County Transportation Commission¹²</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Local Agency</td>
<td>Yolo County, City of Davis and Woodland</td>
<td>Yolo County, City of Woodland, Town of Knights Landing</td>
<td>Yolo County, Town of Knights Landing</td>
<td>Sutter County</td>
</tr>
<tr>
<td>Tribes¹³</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Air District¹⁴</td>
<td>Yolo Solano Air Quality Management District</td>
<td>Yolo Solano Air Quality Management District</td>
<td>Yolo Solano Air Quality Management District</td>
<td>Feather River Air Quality Management District</td>
</tr>
<tr>
<td>Terrain</td>
<td>Flat</td>
<td>Flat</td>
<td>Flat</td>
<td>Flat</td>
</tr>
</tbody>
</table>
Figure 1: SR 113 Route Segmentation Map
COMMUNITY CHARACTERISTICS AND LAND USE

The density and type of land uses along the route vary based on communities and location. The majority of the route crosses agriculture lands that are designated Prime Farmland, Farmland of Statewide Significance, and Unique Farmland. Prime Farmland represents the best land for agricultural production, while Unique Farmland is the least of the three. Within Yolo County there are pockets of Farmland of Statewide Significance areas, but the majority of the route crosses Prime Farmlands that produce a mixture of tomatoes, seed crops, and wheat crops. However, in Sutter County there is a mixture of Prime Farmland, Farmland of Statewide Significance, and Unique Farmland that produce products such as tomatoes, beans, sugar beets and grain. Neither county has plans to change the agricultural land uses within the horizon period because of the priority both counties place on preserving the viability of their agricultural resources.

Within the rural and urban communities land uses vary, some of which include residential, commercial, industrial, and public. The proximity of these land uses to the route also varies between each community. Land uses in the urbanized areas of Davis and Woodland are located further away from SR 113 than in the rural communities where public and private driveways connect to the route. This is more common in Knights Landing than Robbins. Through Robbins the residential and majority of the commercial land uses are isolated east of the route. Whereas through Knights Landing the route is classified as a “Main Street” as commercial, public, and residential driveways connect to the route.

Outside of the City of Davis, City of Woodland, Knights Landing and Robbins a major trip generating facility is the UC Davis campus. The campus is located directly south of the City of Davis and has two main campus sections divided by SR 113 – east of the route is their Main Campus location which contains a mixture of student housing and campus facilities. To the west of the route is their new residential and commercial mixed-use development, West Village, which was built in order to accommodate a growing student population. Both of these sections of campus attract and generate a high number of student and faculty members year round.

The larger populated areas – Davis and Woodland – have seen small growth in population and development in recent years, which has increased the possibility of queuing and congestion along the route during peak hours. Congestion points are increased during peak hours at on-ramp locations which sometimes cause queuing on local streets, such as Main Street in Woodland, as well as delay along the freeway portion of the route where vehicles are forced to merge.

As shown in Tables 4 and 5 below, population, housing, and employment are all expected to rise in both counties. The California Department of Finance projected a population increase of 32 percent (%) in Yolo County and a 59% in Sutter County between the years of 2010 - 2035. The Sacramento Area Council of Governments (SACOG) 2035 Metropolitan Transportation Plan (MTP) projected an increase in the housing units (42.53%) and employment (37.75%) for Yolo County, as well as increases in Sutter County housing (36.43%) and employment (39.76) from 2008 – 2035.

Table 4: Projected Populations of SR 113 Counties

<table>
<thead>
<tr>
<th>Segment #</th>
<th>County</th>
<th>Population (Year 2010)</th>
<th>Projected Population (Year 2035)</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>Yolo County</td>
<td>200,849</td>
<td>266,653</td>
<td>32%</td>
</tr>
<tr>
<td>4</td>
<td>Sutter County</td>
<td>94,737</td>
<td>151,452</td>
<td>59%</td>
</tr>
</tbody>
</table>

Source: 2010 US Census, Yuba-Sutter Census Economic and Demographic Information, and California Department of Finance
Table 5: Housing and Employment of SR 113 Counties

<table>
<thead>
<tr>
<th>Segment #</th>
<th>County</th>
<th>Type</th>
<th>Population (Year 2008)</th>
<th>Projected Population (Year 2035)</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>Yolo County</td>
<td>Housing Units</td>
<td>73,024</td>
<td>104,080</td>
<td>42.53%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Employment</td>
<td>102,378</td>
<td>141,022</td>
<td>37.75%</td>
</tr>
<tr>
<td>4</td>
<td>Sutter County</td>
<td>Housing Units</td>
<td>33,707</td>
<td>45,986</td>
<td>36.43%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Employment</td>
<td>31,751</td>
<td>44,376</td>
<td>39.76%</td>
</tr>
</tbody>
</table>

Sources: The County of Yolo 2030 Countywide General Plan and SACOG 2035 MTP

System Characteristics

Figures 2 through 5 show the location of Segments 1 through 4. Table 6 below identifies the System Characteristics for all segments within SR 113. The following summarizes the characteristics of each segment:

Segment 1 extends 11.14 miles and begins at the I-80 interchange near UC Davis and ends at the I-5 connection in the City of Woodland. The segment is classified as a four-lane freeway, but portions of the route extend to a maximum of six lanes and a minimum of three lanes. This section is the main connection between I-5 and I-80, and the cities of Davis and Woodland. During times of delay on either Interstate SR 113 has been used more frequently as an alternative route connection. In addition, interregional and intraregional transit services use this segment of SR 113 in their daily routes.

Figure 2: SR 113 Segment 1 Map

Segment 2 begins at PM 11.296, near the I-5 north on-ramp along East Street in Woodland, and ends near Knights Landing (PM 21.2). Between Segment 1 and Segment 2 there is a small break because of I-5. This segment is a two-lane conventional highway that primarily crosses unincorporated areas of Yolo County.

Figure 3: SR 113 Segment 2 Map
Segment 3 is 0.87 miles long and is the shortest segment of the four. This segment through Knights Landing is also the only portion of the route that acts as a “Main Street”. Both sides of the route have public and private driveways connections with pedestrian and bicycle facilities that extend across the Sacramento River Bridge into Sutter County. The Sacramento River Bridge is a 24 foot wide drawbridge built in 1933. The bridge has not seen any major upgrades in recent years, but the bridge may need to be replaced or upgraded to meet current bridge standards and accommodate future traffic growth.

Figure 4: SR 113 Segment 3 Map

Segment 4 begins at the Sutter County line (PM 00.00) and ends at the SR 99 connection (PM 16.38), 10 miles south of Yuba City. In this segment, SR 113 passes through flat, agricultural land and crosses the Sutter Bypass overflow channel. With the exception of the rural town of Robbins and the Sutter Bypass Wildlife Area, agricultural use is expected to continue through the 20-year planning period.

Figure 5: SR 113 Segment 4 Map

Figure 6: Knights Landing in Segment 3
**Table 6: SR 113 System Characteristics and Concept Facility**

<table>
<thead>
<tr>
<th>Segment #</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing Facility (BY)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facility Type*</td>
<td>F</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>General Purpose Lanes</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Lane Miles</td>
<td>44.56</td>
<td>19.808</td>
<td>1.74</td>
<td>32.76</td>
</tr>
<tr>
<td>Centerline Miles</td>
<td>11.14</td>
<td>9.904</td>
<td>0.87</td>
<td>16.38</td>
</tr>
<tr>
<td>Intelligent Transportation System (ITS) Elements**</td>
<td>7-TMS</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Build Facility (HY)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facility Type*</td>
<td>F</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>General Purpose Lanes</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Lane Miles</td>
<td>44.56</td>
<td>19.808</td>
<td>1.74</td>
<td>32.76</td>
</tr>
<tr>
<td>Centerline Miles</td>
<td>11.14</td>
<td>9.904</td>
<td>0.87</td>
<td>16.38</td>
</tr>
<tr>
<td>ITS Elements**</td>
<td>7-TMS</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Ultimate Facility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facility Type*</td>
<td>F</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>General Purpose Lanes</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Lane Miles</td>
<td>44.56</td>
<td>19.808</td>
<td>1.74</td>
<td>32.76</td>
</tr>
<tr>
<td>Centerline Miles</td>
<td>11.14</td>
<td>9.904</td>
<td>0.87</td>
<td>16.38</td>
</tr>
<tr>
<td>ITS Elements**</td>
<td>7-TMS</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

* BY=Base Year 2014, HY=Horizon Year 2034, F = Freeway, C = Conventional

** ITS Elements (April 2013 Inventory): RMS=Ramp Metering Stations, TMS=Traffic Monitoring Station, CCTV=Closed Circuit Television

**BICYCLE FACILITY**

Bicyclists are permitted on the majority of SR 113, except for two sections of Segment 1 which are listed in Table 7. Both restrictions are along the freeway portion of the route, which restricts bicyclists from using SR 113 as a route between the cities of Davis and Woodland. Instead, bicyclists are encouraged to use parallel facilities such as County Route (CR) 99 via CR 29 and CR 99D, and CR 102 since both incorporate Class II* bicycle lanes and have lower vehicular speeds and volumes.

SR 113 only incorporates Class II bicycle lanes along one segment of the route, Segment 3 in Knights Landing. However, there is a small break in the Class II striping between 4th and 7th St., but the lane widths remain the same as previous sections with Class II striping. Because SR 113 is a “Main Street” in this segment, it is prone to higher bicyclists’ activities due to the proximity of commercial, public and residential land uses. However, bicyclist activities are mainly contained within Knights Landing. Not many bicyclists travel between Knights Landing and Davis/Woodland, but those that do usually use CR 102 instead of SR 113 since CR 102 is a Class II facility and is a more direct north-south route. As shown in

*Figure 7: Narrow Shoulders in Segment 2*
Figure 7, cyclists who do use SR 113 will have to share the roadway at certain points due to varying shoulder widths because of terrain and vegetation. Outside of the Class II facility, the route does not incorporate any Class I* or Class III* facilities, according to the County of Yolo 2013 Bicycle Transportation Plan (CYBTP) and SACOG’s 2013 Regional Bicycle, Pedestrian and Trails Master Plan.18

Currently, there are no planned or programmed bicycle related projects along SR 113. Though, the local agencies within Yolo County continue to look at ways to improve bicycle facilities between Davis and Woodland though plans such as the CYBTP.


Table 7: SR 113 Bicycle Facilities Existing Conditions

<table>
<thead>
<tr>
<th>Segment #</th>
<th>County, Post Mile</th>
<th>Location Description</th>
<th>State Bicycle Facility</th>
<th>Parallel Bicycle Facility</th>
<th>Facility Type*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>YOLO_ R0.00-R11.14</td>
<td>I-80 at the Solano/Yolo County line to I-5 in the City of Woodland.</td>
<td>PM R0.00 – R4.1: Yes</td>
<td>CR 99 from CR 29 and CR 99D</td>
<td>Class II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-Designated</td>
<td>W Covell Blvd – El Dorado Dr</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>CR 102</td>
<td>Class II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-Designated</td>
<td>E Covell Blvd – E Main St</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PM R4.1 – 7.4: No</td>
<td>CR 99 from CR 29 and CR 99D</td>
<td>Class II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-Designated</td>
<td>W Covell Blvd – El Dorado Dr</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>CR 102</td>
<td>Class II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-Designated</td>
<td>E Covell Blvd – E Main St</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PM R7.4 – R10.718: Yes</td>
<td>CR 99 from CR 29 and CR 99D</td>
<td>Class II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-Designated</td>
<td>W Covell Blvd – El Dorado Dr</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>CR 102</td>
<td>Class II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-Designated</td>
<td>E Covell Blvd – E Main St</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-Designated</td>
<td>W Covell Blvd – El Dorado Dr</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>CR 102</td>
<td>Class II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-Designated</td>
<td>E Covell Blvd – E Main St</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>YOLO_ 11.29-M21.20</td>
<td>SR 113/I-5 northbound off-ramp at East Street in the City of Woodland to Knights Landing</td>
<td>No</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>YOLO_ M21.20-22.08</td>
<td>Knights Landing to Yolo/Sutter County Line</td>
<td>No</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>SUT_ 0.00-16.38</td>
<td>Yolo/Sutter County Line to SR 99</td>
<td>No</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* According to the CYBTP, a Class I bikeway is a trail separated from roads or streets. Bicycles can go either way on a bike path. The minimum paved width of travel for a two-way bike path is 8 feet, 10 feet preferred. A Class II bikeway is the paved edge of a wide street or road, delineated by white stripes. Bike lanes come in pairs, one on each side of the road. The minimum width of a Class II bike lane is 4 feet, except where adjacent to on-street parking. A Class III bikeway is a road or street without bike lanes or bike path, but designated by signs to provide continuity to the bikeway system and share the bike route with motorist. Non-designated means that while the facility is not prohibited to bicyclists; there is no designated bicycle facility on the corridor. For more information, see Figure 3 in the 2013 CYBTP or see Appendix A, Glossary of Terms, for further definitions of bicycle facilities under “Bikeways”.

Exhibit D


PEDESTRIAN FACILITY

Pedestrian facilities share the same access and restriction points as described in the Bicycle section, which are listed in Table 8.

Pedestrian facilities are limited along the route because of segment classification (i.e. freeways) or the areas rural environment. A brief section of Segment 2 in the City of Woodland and Segment 3 in Knights Landing are the only pedestrian facilities along SR 113. The beginning of Segment 2 in Woodland at the N. East Street interchange connection has commercial land uses isolated east of the route with sidewalk connections.

Segment 3 has the most extensive pedestrian facilities because of the proximity of residential, commercial, and public land uses to the route. The route incorporates pedestrian facilities such as sidewalks and crosswalks that move pedestrians along and across the route. Sidewalks begin south of Dixon St and end at the Sacramento River Bridge as shown in Figure 8.

Currently there are no planned or programmed projects to improve pedestrian facilities along SR 113. Caltrans will continue to monitor and evaluate the facilities along the route.

Table 8: SR 113 Pedestrian Facilities Existing Conditions

<table>
<thead>
<tr>
<th>Segment #</th>
<th>County, Post mile</th>
<th>Location Description</th>
<th>Pedestrian Access Prohibited</th>
<th>Sidewalk Present</th>
</tr>
</thead>
</table>
| 1         | YOLO_ R0.00-R11.14 | I-80 at the Solano/Yolo County line to I-5 in the City of Woodland. | PM R0.00 – R4.1: Yes  
PM R4.1 – 7.4: Yes  
PM R7.4 – R10.718: Yes  
PM R10.717 – R11.14: Yes | No |
| 2         | YOLO_ 11.29-M21.20 | SR 113/I-5 northbound off-ramp at East Street in the City of Woodland to Knights Landing | No | No |
| 3         | YOLO_ M21.20-22.08 | Knights Landing to Yolo/Sutter County Line | No | Yes |
| 4         | SUT_ 0.00-16.38   | Yolo/Sutter County Line to SR 99 | No | No |

TRANSIT FACILITY

Yolo County, through its Yolobus transit service provides interregional and intraregional service to the cities of Davis, West Sacramento, Woodland, community of Knights Landing and other communities’ located in-between. SR 113 between Davis and Woodland is used by the regular, express, and commuter routes. Routes up to Knights Landing do not use SR 113; instead they use CR 102 because it is more direct. Sutter County does not provide transit service to areas along SR 113. Table 9 provides a summary of Transit operators and facilities available within the SR 113 TCR corridor.

Table 9: SR 113 Transit Facilities Existing Conditions

<table>
<thead>
<tr>
<th>Segment #</th>
<th>Mode &amp; Collateral Facility</th>
<th>Operator Name</th>
<th>Route End Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Interregional Bus</td>
<td>Yolobus</td>
<td>Davis to Woodland</td>
</tr>
</tbody>
</table>
**Freight**

State Route 113 is classified as a Terminal Access (TA) route according to the California Truck Route Classification map. TA routes are state or local routes that allow access to trucks that meet the federal Surface Transportation Assistance Act of 1982 (STAA) requirements as identified in Table 10.

**Table 10: STAA Truck Requirements**

<table>
<thead>
<tr>
<th>STAA Truck with Single Trailer:</th>
<th>STAA Truck with Double Trailer:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-trailer = 48 feet maximum</td>
<td>Semi-trailer = 28 feet 6 inches maximum</td>
</tr>
<tr>
<td>KPRA = no limit</td>
<td>Trailer = 28 feet 6 inches maximum</td>
</tr>
<tr>
<td>Combination length = no limit</td>
<td>KPRA = no limit</td>
</tr>
<tr>
<td>OR</td>
<td>Combination length = no limit</td>
</tr>
<tr>
<td>Semi-trailer = over 48 feet, but 53 feet maximum</td>
<td></td>
</tr>
<tr>
<td>KPRA = 40 feet max (if 2+ axles in rear)</td>
<td></td>
</tr>
<tr>
<td>KPRA = 38 feet max (if 1 axle in rear)</td>
<td></td>
</tr>
<tr>
<td>Combination length = no limit</td>
<td></td>
</tr>
</tbody>
</table>

Source: [http://www.dot.ca.gov/hq/traffops/trucks/routes/truck-routes.htm](http://www.dot.ca.gov/hq/traffops/trucks/routes/truck-routes.htm)

According to the Sacramento Area Council of Government (SACOG) Metropolitan Transportation Plan (MTP), the agricultural areas around SR 113 produce some of the highest number of trucks per acre (> 0.5 trucks/acre) in the SACOG region (El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba Counties). Because of this, the potential for congestion on the route increases, especially on the two-lane highway rural arterial sections of the route.

Congestion is not an issue along the freeway portion of the route because trucks merge onto the freeway at interchanges. However, along the two-lane highway sections of the route, trucks merge directly onto the route from facilities. Due to acceleration and speed restrictions as well as geometric limitations for turning, trucks can be a direct cause of congestion. However, because the route is relatively flat and has long straight-away sections, vehicles do have opportunities to pass slow-moving trucks.

Currently there are no planned or programmed projects along the roadway that would affect freight movement. Wear and tear along the roadway from trucks should continue to be monitored since SR 113 is a main north-south rural arterial for the agricultural areas of Sutter and Yolo counties. Existing freight facilities are identified in Table 11 and the existing freight network is delineated in Figure 10.

**District 3 Goods Movement Plan**

In 2013, Caltrans District 3 was fully underway in creating a district-wide Goods Movement Plan. The Plan will synthesize the findings of other goods movement related plans in the District and State, conduct a district-wide assessment of the District 3 Goods Movement network, propose a prioritization framework to identify and prioritize projects, and propose a list of prioritized projects for potential funding that will sustain or improve goods movement throughput. The plan will require significant outreach, collaboration, and consensus with stakeholders, including public agencies such as the SACOG, and the private sector entities such as the California Trucking Association. Findings from the study will be included in the Statewide Freight Mobility Plan, and will be transferrable to other Caltrans Districts statewide for implementation. The **District 3 Goods Movement Plan** is scheduled to be finished in 2015. More information can be found at: [https://sites.google.com/site/d03goodsmovement/](https://sites.google.com/site/d03goodsmovement/).
Table 11: SR 113 Freight Facilities Existing Conditions

<table>
<thead>
<tr>
<th>Segment #</th>
<th>Facility Type/Freight Generator</th>
<th>Location</th>
<th>Mode</th>
<th>Name</th>
<th>Major Commodity/Industry</th>
<th>Comments/Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Freeway</td>
<td>Yolo County</td>
<td>Truck</td>
<td>SR 113 (Terminal Access)</td>
<td>Agriculture/Industrial</td>
<td>---</td>
</tr>
<tr>
<td>2</td>
<td>Highway</td>
<td>Yolo County</td>
<td>Truck</td>
<td>SR 113 (Terminal Access)</td>
<td>Agriculture</td>
<td>Narrow paved shoulders and no passing lanes</td>
</tr>
<tr>
<td>3</td>
<td>Highway</td>
<td>Yolo County</td>
<td>Truck</td>
<td>SR 113 (Terminal Access)</td>
<td>Agriculture</td>
<td>Varying paved shoulder widths. Crosses through Knights Landing which has adjacent commercial, residential and public land uses</td>
</tr>
<tr>
<td>4</td>
<td>Highway</td>
<td>Sutter County</td>
<td>Truck</td>
<td>SR 113 (Terminal Access)</td>
<td>Agriculture</td>
<td>Narrow paved shoulders and no passing lanes</td>
</tr>
</tbody>
</table>

**AIRPORT FACILITY**

There is one public airport and four private air fields within 5 miles of SR 113.

The **University Airport** in Davis has a Community functional class. The airport is owned by the University of CA Davis, and is the only campus in the University of California system with an airport. The airport serves the University, and City of Davis’ corporate, business, and agriculture needs, tourism, and air taxi service. Airport services include search and rescue, disaster/emergency services, aero medical evacuation, flight training, aircraft rental and sales, aircraft fuel sales, and major aircraft repair. There are 45 based aircraft, and 24,475 operations for the 12 month period ending May 30, 2013. The airport is home to the Cal Aggie Flying Farmers, the University’s flying club.

One air field, **Medlock Field**, is located between Davis and Woodland. Two of the air fields, **Sunrise Duster's Airport** and **Bob's Flying Service Inc. Airport**, are located in the vicinity of Knights Landing. The fourth field, **Wagner Aviation Airport**, is located rear Robbins. These air fields primarily service agriculture needs.
Figure 10: SR 113 Freight Network Map
CORRIDOR PERFORMANCE

The performance measures used for the highway facility in this TCR include Level of Service (LOS), Vehicle Miles Traveled (VMT), Peak Hour Volume over Capacity (V/C), and Peak Hour VMT. The data inputs used to determine the performance measures include Average Annual Daily Traffic (AADT), Truck AADT, Percent of Trucks, 5+ Axle Truck AADT, and 5 Axle Truck Percentage of AADT. The definitions, applicability, and sources of the baseline performance measures data used in this TCR corridor are identified in Appendix A. This data is given for both the Base Year of 2014 and Horizon Year of 2034 for both a “No Build” and “Build” scenarios where applicable. Basic system operation, truck traffic, and peak hour traffic performance data is discussed below and summarized in Table 12.

The future LOS for the four segments of SR 113 are projected to decrease over the 20-year horizon period because of projected increases in vehicle miles traveled. LOS is a qualitative measure describing operational conditions within a traffic stream and perception of condition by users. Operational conditions are defined in terms of speed, travel time, freedom to maneuver, traffic interruption, comfort, and convenience. LOS is defined into six levels with letter designations from A to F. LOS A represents the best operating conditions wherein there is ample maneuverability, no speed restrictions and no delay, while LOS F represents the worst operating conditions with traffic congestions, significant delays and restricted maneuverability.

Caltrans has set a minimum LOS of LOS D in rural areas (population less than 2,500), LOS E in urban cluster (population 2,500 to 49,999), and LOS E urbanized areas (population over 50,000). However, these standards may vary depending on the unique corridor conditions. A local agency may set a higher LOS threshold standard consistent with community wishes and local concerns. Since Caltrans Concept LOS defines the minimum acceptable level of service established by Caltrans as the owner and operator of the facility, the threshold standard LOS established by the local agency should not be lower than the Caltrans Concept LOS.19

Segment 1 has the highest base year average daily traffic (ADT) out of all the segments because it is a four-lane freeway and facilitates traffic between major SHS routes and the cities of Davis and Woodland. The base year (2014) ADT for this segment is 39,775 with a LOS of B. Of the 39,775 trips, 1,868 are truck traffic with 939 of those trips generated by 5+ axle trucks. The base year peak hour volume/capacity (V/C) is 0.39 and is projected to reach 0.56 in the Build scenario. Overall, the segment’s capacity is projected to increase over the 20-year horizon period to a maximum of 67,525 in the Build scenario. This scenario will also decrease the LOS to C, but still meets the minimum Caltrans LOS standards.

Segment 2 has a base year ADT of 6,793, the smallest out of all the segments. Out of the 6,793 trips, 270 come from truck traffic with 132 of those trips from 5+ axle trucks. In total the base year LOS for this segment is currently at C and is projected to decrease in the Build scenario to LOS D. During peak hours the current V/C is 0.26 and is projected to reach 0.34 in the Build scenario.

Segment 3 has a base year ADT of 9,152 with a base year LOS of D. Out of the 9,152 trips, 581 of those trips are from trucks with 132 trips coming from 5+ axle trucks. During peak hours the base year V/C is 0.32. In total, the LOS is expected to decrease to E due to the increase in ADT (12,672) which will increase the peak V/C to 0.47. This is the only segment that is projected to not meet the minimum LOS standard for a rural area (population less than 2,500).

Segment 4 is the lone section in Sutter County. It has a base year ADT of 8,216 with a LOS C. Out of the 8,216 trips, 581 of those trips are truck traffic with 132 of the truck trips coming from 5+ axle trucks. During peak hours it has a V/C of 0.28. Over the 20-year horizon period this segment is expected to see a peak of 11,376 ADT with a peak hour V/C of 0.42 and a LOS D.
# Table 12: SR 113 Corridor Performance Measures

## BASIC SYSTEM OPERATIONS

<table>
<thead>
<tr>
<th>Segment</th>
<th>County, PM</th>
<th>Average Annual Daily Traffic (AADT)</th>
<th>Level of Service (LOS)</th>
<th>Vehicle Miles Traveled (VMT)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Base Year (BY)</td>
<td>No Build Horizon Year (HY)</td>
<td>Build (HY)</td>
</tr>
<tr>
<td>1</td>
<td>YOL: 0.000-11.14</td>
<td>39,775</td>
<td>67,313</td>
<td>67,525</td>
</tr>
<tr>
<td>2</td>
<td>YOL: 11.296-21.20</td>
<td>6,793</td>
<td>9,254</td>
<td>9,718</td>
</tr>
<tr>
<td>3</td>
<td>YOL: 21.20-22.07</td>
<td>9,152</td>
<td>12,637</td>
<td>12,672</td>
</tr>
<tr>
<td>4</td>
<td>SUT: 0.00-16.38</td>
<td>8,216</td>
<td>11,331</td>
<td>11,376</td>
</tr>
</tbody>
</table>

## TRUCK TRAFFIC DATA

<table>
<thead>
<tr>
<th>Segment</th>
<th>County, PM</th>
<th>Average Annual Daily Truck Traffic (AADTT) (BY)</th>
<th>Total Trucks (% of AADT) (BY)</th>
<th>5+ Axle AADTT (BY)</th>
<th>5+ Axle Total Truck (% of AADT) (BY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>YOL: 0.000-11.14</td>
<td>1,868</td>
<td>7.70%</td>
<td>939</td>
<td>3.87%</td>
</tr>
<tr>
<td>2</td>
<td>YOL: 11.296-21.20</td>
<td>270</td>
<td>7.00%</td>
<td>132</td>
<td>1.59%</td>
</tr>
<tr>
<td>3</td>
<td>YOL: 21.20-22.07</td>
<td>581</td>
<td>7.00%</td>
<td>132</td>
<td>1.59%</td>
</tr>
<tr>
<td>4</td>
<td>SUT: 0.00-16.38</td>
<td>581</td>
<td>7.00%</td>
<td>132</td>
<td>1.59%</td>
</tr>
</tbody>
</table>

## PEAK HOUR TRAFFIC DATA

<table>
<thead>
<tr>
<th>Segment</th>
<th>County, PM</th>
<th>Volume</th>
<th>Directional Split</th>
<th>Volume/Capacity (V/C)</th>
<th>VMT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BY</td>
<td>No Build (HY)</td>
<td>Build (HY)</td>
<td>BY</td>
</tr>
<tr>
<td>1</td>
<td>YOL: 0.000-11.14</td>
<td>3,924</td>
<td>6,563</td>
<td>6,661</td>
<td>60%</td>
</tr>
<tr>
<td>2</td>
<td>YOL: 11.296-21.20</td>
<td>700</td>
<td>912</td>
<td>1,002</td>
<td>54%</td>
</tr>
<tr>
<td>3</td>
<td>YOL: 21.20-22.07</td>
<td>863</td>
<td>1,185</td>
<td>1,195</td>
<td>54%</td>
</tr>
<tr>
<td>4</td>
<td>SUT: 0.00-16.38</td>
<td>749</td>
<td>1,027</td>
<td>1,037</td>
<td>55%</td>
</tr>
</tbody>
</table>

*The Corridor Performance Measures table is based on Base Year (BY) 2014 traffic data and estimates a Horizon Year (HY) of 2034.*
KEY CORRIDOR ISSUES

A key issue for all segments along the route is meeting the concept LOS standards. Based on the performance measures identified in Table 12, only three out of the four segments are projected to at least meet the ultimate concept LOS standards. Segment 3, through Knights Landing, is projected in the 20-year horizon period to have a LOS E, which is below the ultimate concept LOS D standard for rural areas. A priority on projects and strategies that would improve the segments LOS to at least the stated minimum LOS for a rural area should be evaluated.

The LOS for Segment 1 is not projected to drop below the minimum standard of LOS E, but congestion during peak hours is a concern due to the fact that it is the primary route between major SHS routes and the cities of Davis and Woodland. Currently, SR 113 is still equipped to handle the projected population, but certain merge points along the route (i.e., lane reduction or on/off ramps) have a tendency to cause congestion. Monitoring the impacts new developments have on SR 113 should continue and improvements to alleviate issues should be considered as they arise.

In addition, in the past there have been flooding occurrences along the route in Segments 2-4. Portions of these segments are in the 100-year flood plain. Specifically for Segment 4, the entire segment is expected to be classified as a Special Flood Hazard Area (SFHA) A Zone (100-year flood plain) by 2016 or 2017 due to the non-certified levees. Projects and strategies which may include converting SR 113 into an “all weather” route is one alternative to evaluate if flooding along the route becomes an issue.

Overall, maintaining the routes pavement conditions is an on-going priority due to the current and future growth projections of commuter and truck on all segments of the route.

CORRIDOR CONCEPT

CONCEPT RATIONALE

The concept LOS for segment 1 is LOS E, which is standard for areas classified as urban cluster (population 2,500 to 49,999) and urbanized areas (population over 50,000). The rural sections, Segments 2-4, have a concept LOS D, which is the standard for rural areas (population less than 2,500). Based off the performance measures three of the four segments are anticipated to meet their ultimate concept LOS. However, Segment 3, is projected to fall below the concept LOS for rural areas, as it is projected to have a LOS E. Projects such as operational improvements, intelligent transportation systems, transportation demand management, active multimodal corridor management strategies, and reduction of travel demand on the SHS by increased use of transit and development of parallel facilities will be considered to help attain the Ultimate Concept. The concept of Complete Streets should also be considered and implemented in future design and construction of improvements in the urban cluster and small communities to the SR 113 Corridor, whenever feasible.

PROJECTS AND STRATEGIES

Projects and strategies to achieve the facility concept have two categories of funding status: fiscally constrained and fiscally unconstrained.

Fiscally constrained projects and strategies are projects that can be implemented using committed, available, or reasonably available revenue sources.

Fiscally unconstrained projects and strategies are conceptual transportation improvements without an identified funding source and may be funded if reasonable additional resources become available.
In addition to the funding status categories, there are three types of transportation improvements or actions: programmed, planned, and conceptual. Projects and strategies to achieve SR 113 facility concept are grouped into (1) planned and programmed projects, and (2) conceptual projects.

**Planned and Programmed Projects and Strategies**

**Planned Project:** A planned improvement or action is a project in a fiscally constrained section of a long-term plan, such as an approved Regional or Metropolitan Transportation Plan (RTP or MTP), Capital Improvement Plan, or measure.

**Programmed Project:** A programmed improvement or action is a project in a near-term programming document that identifies funding amounts by year, such as the State Transportation Improvement Program of the State Highway Operations and Protection Program.

Lists of Planned and Programmed projects and strategies are contained in Table 13 below.

**Table 13: SR 113 Planned and Programmed Projects and Strategies**

<table>
<thead>
<tr>
<th>Segment #</th>
<th>Description</th>
<th>Planned or Programmed</th>
<th>Location, County, PM</th>
<th>Lead Agency</th>
<th>Source*</th>
<th>Purpose</th>
<th>Total Cost Estimate* ($1,000)</th>
<th>Proposed Completion Year*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Phase 2 - Construct northbound I-5 to southbound SR 113 freeway to freeway connection.</td>
<td>Planned</td>
<td>SR 113/I-5, YOL, R6.4-R6.8</td>
<td>Caltrans</td>
<td>2035 SACOG MTP</td>
<td>Operational Improvements</td>
<td>68,012</td>
<td>2026</td>
</tr>
<tr>
<td>1</td>
<td>Construct New Interchange: NB SR 113 to SB I-5 freeway to freeway connection. Phase 3.</td>
<td>Planned</td>
<td>SR 113/I-5, YOL, R10.7-R10.7</td>
<td>Caltrans</td>
<td>2035 SACOG MTP</td>
<td>Operational Improvements</td>
<td>66,000</td>
<td>2034</td>
</tr>
<tr>
<td>1</td>
<td>Upgrade curb ramps from north to south of Davis to comply with American With Disabilities Act.</td>
<td>Programmed</td>
<td>SR 113, Davis, YOL, 0.3-2.2</td>
<td>Caltrans</td>
<td>2035 SACOG MTP/ SACOG MTIP</td>
<td>ADA Compliance</td>
<td>1,460</td>
<td>2020</td>
</tr>
<tr>
<td>1</td>
<td>From Davis to Woodland, Rehabilitate pavement (PCC profile grind).</td>
<td>Programmed</td>
<td>Davis-Woodland, YOL, 0.00-11.1</td>
<td>Caltrans</td>
<td>2035 SACOG MTP/ SACOG MTIP</td>
<td>Pavement Rehabilitation</td>
<td>8,462</td>
<td>2020</td>
</tr>
<tr>
<td>4</td>
<td>Near Tudor, from 1.8 miles north of Wilson Road to 2.1 miles south of O’Banion Road - Construct an interchange at SR 99/SR 113 (SR 99 PM R19.5/R20.5; SR 113 PM 16.3/16.7)</td>
<td>Construction</td>
<td>SR 113/SR 99, SUT, 16.3-16.3</td>
<td>Caltrans</td>
<td>2035 SACOG MTP</td>
<td>Operational Improvements</td>
<td>19,350</td>
<td>2014</td>
</tr>
</tbody>
</table>

* Total Cost Estimate and Proposed Completion Year are from listed source. Additional project details and programming information can be found in the listed source. Note, RTPs included separate fiscally unconstrained section. Please see appendix B-Resources for more information regarding the listed source.

**Conceptual Projects and Strategies**

**Conceptual Project:** A conceptual improvement or action is a project that is needed to maintain mobility or serve multimodal users, but is not currently included in a fiscally constrained plan and is not currently programmed. It could be included in a General Plan or in the unconstrained section of a long-term plan.
Caltrans District 3 is currently developing the *Caltrans District 3 Intelligent Transportation Systems/Operational Improvement (ITS/Ops) Plan*. This plan will provide critical guidance to optimize the State Highway System within the District by identifying and managing ITS and other operational strategies that yield a very high return on investment. Further information on the planning and deployment of ITS and operational improvements within District 3 can be reviewed in the *District 3 ITS/Ops Plan* (forthcoming) and the *District 3 Concept of Operations Plan* (expected to be complete in 2015). For more information visit: [http://www.dot.ca.gov/dist3/departments/planning/](http://www.dot.ca.gov/dist3/departments/planning/).

Conceptual projects and strategies that will help SR 113 meet the Ultimate LOS Concept are listed in Table 14.

### Table 14: SR 113 Projects and Strategies to Achieve Concept

<table>
<thead>
<tr>
<th>Segment #</th>
<th>Description</th>
<th>Location, County, PM</th>
<th>Lead Agency</th>
<th>Source*</th>
<th>Purpose</th>
<th>Total Cost Estimate* ($1,000)</th>
<th>Proposed Completion Year*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Add turn lanes for access-egress to SR 113 including the overcrossing structure</td>
<td>Covell Blvd./SR 113, YOL, 0.00-1.14</td>
<td>City of Davis</td>
<td>2035 SACOG MTP</td>
<td>Operational Improvements</td>
<td>15,000</td>
<td>2040</td>
</tr>
<tr>
<td>1</td>
<td>Class I bike/low speed electric vehicle path between Davis and Woodland, along alignment identified in September 2009 feasibility study</td>
<td>Near J St/Covell Blvd in Davis to 24A/6th St in Woodland, YOL, Parallel to SR 113</td>
<td>City of Woodland Dept of Public Works, City of Davis Dept of Public Works</td>
<td>Yolo County 2013 Bicycle Transportation Plan</td>
<td>Bike/Pedestrian improvements</td>
<td>9,640</td>
<td>2040</td>
</tr>
<tr>
<td>1</td>
<td>Woodland—Bicycle/pedestrian improvements on Main Street that is currently functioning as the I-5/SR 113 interchange</td>
<td>Main Street in Woodland, YOL, 11.14</td>
<td>Caltrans</td>
<td>Draft D3 ITS Ops Plan</td>
<td>Bike/Pedestrian improvements</td>
<td>N/A</td>
<td>2040</td>
</tr>
<tr>
<td>1</td>
<td>Davis—Woodland Bikeway: connect low volume frontage roads on the west side of SR 113</td>
<td>West of SR 113 between Davis and Woodland, YOL, 0.00-11.14</td>
<td>Caltrans</td>
<td>Yolo County 2013 Bicycle Transportation Plan</td>
<td>Bike/Pedestrian improvements</td>
<td>5,500</td>
<td>2040</td>
</tr>
<tr>
<td>1</td>
<td>Class II bike lanes on SR 113</td>
<td>CR 27 to CR 25A, between Davis and Woodland, YOL, R6.11-7.46</td>
<td>Yolo County</td>
<td>SACOG 2013 Regional Bicycle, Pedestrian and Trails Master Plan</td>
<td>Bike/Pedestrian improvements</td>
<td>N/A</td>
<td>2040</td>
</tr>
<tr>
<td>3</td>
<td>Bike facilities, streetscape elements, crosswalks, and signage where feasible</td>
<td>Knights Landing, YOL, 21.2-22.07</td>
<td>Caltrans</td>
<td>Draft D3 ITS Ops Plan</td>
<td>Bike/Pedestrian improvements</td>
<td>N/A</td>
<td>2040</td>
</tr>
<tr>
<td>4</td>
<td>Class III Bike route on SR 113</td>
<td>Robbins to SR 99, SUT, 4.893-16.38</td>
<td>Sutter County</td>
<td>Sutter County 2012 Pedestrian &amp; Bikeway Master Plan</td>
<td>Bike/Pedestrian improvements</td>
<td>N/A</td>
<td>2040</td>
</tr>
</tbody>
</table>

*Total Cost Estimate and Proposed Completion Year are from listed source. Additional project details and programming information can be found in the listed source. Note, RTPs included separate fiscally unconstrained section. Please see appendix B-Resources for more information regarding the listed source.
# APPENDICES

## APPENDIX A: GLOSSARY OF TERMS AND ACRONYMS

### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AADT</td>
<td>Annual Average Daily Traffic</td>
</tr>
<tr>
<td>ADT</td>
<td>Average Daily Traffic</td>
</tr>
<tr>
<td>BY</td>
<td>Base Year</td>
</tr>
<tr>
<td>CALTRANS</td>
<td>California Department of Transportation</td>
</tr>
<tr>
<td>CLA</td>
<td>California Legal Advisory</td>
</tr>
<tr>
<td>CLN</td>
<td>California Legal Network</td>
</tr>
<tr>
<td>CMA</td>
<td>Congestion Management Agencies</td>
</tr>
<tr>
<td>CR</td>
<td>County Route</td>
</tr>
<tr>
<td>CSS</td>
<td>Context Sensitive Solutions</td>
</tr>
<tr>
<td>CSMP</td>
<td>Corridor System Management Plan</td>
</tr>
<tr>
<td>CT</td>
<td>Caltrans</td>
</tr>
<tr>
<td>CTC</td>
<td>County Transportation Commission</td>
</tr>
<tr>
<td>DSMP</td>
<td>District System Management Plan</td>
</tr>
<tr>
<td>DSMDP</td>
<td>District System Management and Development Plan</td>
</tr>
<tr>
<td>FHWA</td>
<td>Federal Highway Administration</td>
</tr>
<tr>
<td>GHG</td>
<td>Green House Gas</td>
</tr>
<tr>
<td>HCM</td>
<td>Highway Capacity Manual</td>
</tr>
<tr>
<td>HCP</td>
<td>Habitat Conservation Plan</td>
</tr>
<tr>
<td>HY</td>
<td>Horizon Year</td>
</tr>
<tr>
<td>I</td>
<td>Interstate</td>
</tr>
<tr>
<td>ITS</td>
<td>Intelligent Transportation System</td>
</tr>
<tr>
<td>ITSP</td>
<td>Interregional Transportation System Plan</td>
</tr>
<tr>
<td>KPRA</td>
<td>Kingpin-to-rear-axle</td>
</tr>
<tr>
<td>LOS</td>
<td>Level of Service</td>
</tr>
<tr>
<td>MPO</td>
<td>Metropolitan Planning Organizations</td>
</tr>
<tr>
<td>MTIP</td>
<td>Metropolitan Transportation Improvement Program</td>
</tr>
<tr>
<td>MTP</td>
<td>Metropolitan Transportation Plan</td>
</tr>
<tr>
<td>NOA</td>
<td>Naturally Occurring Asbestos</td>
</tr>
<tr>
<td>NCCP</td>
<td>Natural Community Conservation Plan</td>
</tr>
<tr>
<td>PID</td>
<td>Project Initiation Document</td>
</tr>
<tr>
<td>PM</td>
<td>Post Mile</td>
</tr>
<tr>
<td>PSR</td>
<td>Project Study Report</td>
</tr>
<tr>
<td>ROW</td>
<td>Right of Way</td>
</tr>
<tr>
<td>RTP</td>
<td>Regional Transportation Plan</td>
</tr>
<tr>
<td>RTIP</td>
<td>Regional Transportation Improvement Program</td>
</tr>
<tr>
<td>RTPA</td>
<td>Regional Transportation Planning Agencies</td>
</tr>
<tr>
<td>SACOG</td>
<td>Sacramento Area Council of Governments</td>
</tr>
<tr>
<td>SCS</td>
<td>Sustainable Community Strategies</td>
</tr>
<tr>
<td>SFHA</td>
<td>Special Flood Hazard Area</td>
</tr>
<tr>
<td>SHBFP</td>
<td>State Highway Bicycle Facility Plan</td>
</tr>
<tr>
<td>SHOPP</td>
<td>State Highway Operation Protection Program</td>
</tr>
<tr>
<td>SHS</td>
<td>State Highway System</td>
</tr>
<tr>
<td>SR</td>
<td>State Route</td>
</tr>
<tr>
<td>STAA</td>
<td>Surface Transportation Assistance Act</td>
</tr>
</tbody>
</table>
Definitions

AADT – Annual Average Daily Traffic is the total volume for the year divided by 365 days. The traffic count year is from October 1st through September 30th. Traffic Counting is generally performed by electronic counting instruments moved from location throughout the State in a program of continuous traffic count sampling. The resulting counts are adjusted to an estimate of annual average daily traffic by compensating for seasonal influence, weekly variation and other variables which may be present. Annual ADT is necessary for presenting a statewide picture of traffic flow, evaluating traffic trends, computing accident rates, planning and designing highways and other purposes.

Base year – The year that the most current data is available to the Districts.

Bikeway Class I (Bike Path) – Provides a completely separated right of way for the exclusive use of bicycles and pedestrians with cross flow by motorists minimized.

Bikeway Class II (Bike Lane) – Provides a striped lane for one-way bike travel on a street or highway.

Bikeway Class III (Bike Route) – Provides for shared use with pedestrian or motor vehicle traffic.

California Legal Truck – A truck tractor-semitrailer (or double) that can travel on virtually any route in California, as described below:

<table>
<thead>
<tr>
<th>California Legal Truck Tractor – Semitrailer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semitrailer length: no limit</td>
</tr>
<tr>
<td>KPRA : 40 feet maximum for two or more axles,</td>
</tr>
<tr>
<td>38 feet maximum for single-axle trailers</td>
</tr>
<tr>
<td>Overall length: 65 feet maximum</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>California Legal Truck Tractor - Semitrailer - Trailer (Doubles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option A</td>
</tr>
<tr>
<td>Trailer length: 28 feet 6 inches maximum (each trailer)</td>
</tr>
<tr>
<td>Overall length: 75 feet maximum</td>
</tr>
<tr>
<td>Option B</td>
</tr>
<tr>
<td>Trailer length: 28 feet 6 inches maximum (each trailer)</td>
</tr>
<tr>
<td>Overall length: 75 feet maximum</td>
</tr>
</tbody>
</table>

Capacity – The maximum sustainable hourly flow rate at which persons or vehicles reasonably can be expected to traverse a point or a uniform section of a lane or roadway during a given time period under prevailing roadway, environmental, traffic, and control conditions.
**Capital Facility Concept** – The 20-25 year vision of future development on the route to the capital facility. The capital facility can include capacity increasing, State Highway, bicycle facility, pedestrian facility, transit facility (Intercity Passenger rail, Mass Transit Guideway etc.), grade separation, and new managed lanes.

**Concept LOS** – The minimum acceptable LOS over the next 20-25 years.

**Conceptual Project** – A conceptual improvement or action is a project that is needed to maintain mobility or serve multimodal users, but is not currently included in a financially constrained plan and is not currently programmed. It could be included in a General Plan or in the unconstrained section of a long-term plan.

**Corridor** – A broad geographical band that follows a general directional flow connecting major sources of trips that may contain a number of streets, highways, bicycle, pedestrian, and transit route alignments. Off system facilities are included as informational purposes and not analyzed in the TCR.

**Facility Concept** – Describes the facility and strategies that may be needed within 20-25 years. This can include capacity increasing, State Highway, bicycle facility, pedestrian facility, transit facility, non-capacity increasing operational improvements, new managed lanes, conversion of existing managed lanes to another managed lane type or characteristic, TMS field elements, transportation demand management and incident management.

**Facility Type** – The facility type describes the state highway facility type. The facility could be freeway, expressway, conventional, or one-way city street.

**Freight Generator** – Any facility, business, manufacturing plant, distribution center, industrial development, or other location (convergence of commodity and transportation system) that produces significant commodity flow, measured in tonnage, weight, carload, or truck volume.

**Headway** – The time between two successive vehicles as they pass a point on the roadway, measured from the same common feature of both vehicles.

**Horizon Year** – The year that the future (20-25 years) data is based on.

**ITS** – Intelligent Transportation System improves transportation safety and mobility and enhances productivity through the integration of advanced communications technologies into the transportation infrastructure and in vehicles. Intelligent transportation systems encompass a broad range of wireless and wire line communications-based information and electronics technologies to collect information, process it, and take appropriate actions.

**LOS** – Level of Service is a qualitative measure describing operational conditions within a traffic stream and their perception by motorists. A LOS definition generally describes these conditions in terms of speed, travel time, freedom to maneuver, traffic interruption, comfort, and convenience. Six levels of LOS can generally be categorized as follows:

- **LOS A** describes free flowing conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway.

- **LOS B** is also indicative of free-flow conditions. Average travel speeds are the same as in LOS A, but drivers have slightly less freedom to maneuver.
LOS C represents a range in which the influence of traffic density on operations becomes marked. The ability to maneuver with the traffic stream is now clearly affected by the presence of other vehicles.

LOS D demonstrates a range in which the ability to maneuver is severely restricted because of the traffic congestion. Travel speed begins to be reduced as traffic volume increases.

LOS E reflects operations at or near capacity and is quite unstable. Because the limits of the level of service are approached, service disruptions cannot be damped or readily dissipated.

LOS F a stop and go, low speed conditions with little or poor maneuverability. Speed and traffic flow may drop to zero and considerable delays occur. For intersections, LOS F describes operations with delay in excess of 60 seconds per vehicle. This level, considered by most drivers unacceptable often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection.

Multi-modal – The availability of transportation options using different modes within a system or corridor, such as automobile, subway, bus, rail, or air.

System Operations and Management Concept – Describes the system operations and management elements that may be needed within 20-25 years. This can include Non-capacity increasing operational improvements (Aux. lanes, channelization’s, turnouts, etc.), conversion of existing managed lanes to another managed lane type or characteristic (e.g. HOV land to HOT lane), TMS Field Elements, Transportation Demand Management, and Incident Management.

Peak Hour – The hour of the day in which the maximum volume occurs across a point on the highway.

Peak Hour Volume – The hourly volume during the highest hour traffic volume of the day traversing a point on a highway segment. It is generally between 6 percent and 10 percent of the ADT. The lower values are generally found on roadways with low volumes.

Planned Project – A planned improvement or action is a project in a financially constrained section of a long-term plan, such as an approved Regional or Metropolitan Transportation Plan (RTP or MTP), Capital Improvement Plan, or measure.

Post Mile – A post mile is an identified point on the State Highway System. The milepost values increase from the beginning of a route within a count to the next county line. The milepost values start over again at each county line. Milepost values usually increase from south to north or west to east depending upon the general direction the route follows within the state. The milepost at a given location will remain the same year after year. When a section of road is relocated, new milepost (usually noted by an alphabetical prefix such as "R" or "M") are established for it. If relocation results in a change in length, "milepost equations" are introduced at the
end of each relocated portion so that mileposts on the reminder of the route within the county will remain unchanged.

**Programmed Project** – A programmed improvement or action is a project in a near-term programming document identifying funding amounts by year, such as the State Transportation Improvement Program or the State Highway Operations and Protection Program.

**Route Designation** – A route’s designation is adopted through legislation and identifies what system the route is associated with on the State Highway System. A designation denotes what design standards should apply during project development and design. Typical designations include but not limited to National Highway System (NHS), Interregional Route System (IRRS), and Scenic Highway System.

**Rural** – Fewer than 2,500 in population designates a rural area. Limits are based upon population density as determined by the U.S. Census Bureau.

**Segment** – A portion of a facility between two points.

**(Interstate) STAA Truck** – A truck tractor-semitrailer (or double that conforms to the requirements to the STAA, as described below:

![STAA Truck](image)

<table>
<thead>
<tr>
<th><strong>Interstate “STAA” Truck Tractor – Semitrailer</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Semitrailer length: 48 feet maximum</td>
</tr>
<tr>
<td>KPRA</td>
</tr>
<tr>
<td>Overall length: no limit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Interstate “STAA” Truck Tractor – Semitrailer</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Semitrailer length: over 48 feet up to 53 feet maximum</td>
</tr>
<tr>
<td>KPRA</td>
</tr>
<tr>
<td>Overall length: no limit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Interstate “STAA” Truck Tractor–Semitrailer–Trailer (Doubles)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Trailer length: 28 feet 6 inches maximum (each trailer)</td>
</tr>
<tr>
<td>Overall length: no limit</td>
</tr>
</tbody>
</table>

**TDM** – Transportation Demand Management programs designed to reduce or shift demand for transportation through various means, such as the use of public transportation, carpooling, telework, and alternative work hours. Transportation Demand Management strategies can be used to manage congestion during peak periods and mitigate environmental impacts.

**TMS** – Transportation Management System is the business processes and associated tools, field elements and communications systems that help maximize the productivity of the transportation system. TMS includes, but is not limited to, advanced operational hardware, software, communications systems and infrastructure, for integrated Advanced Transportation Management Systems and Information Systems, and for Electronic Toll Collection System.

**Ultimate Concept** - In general, this is also called the Post 20-Year concept that could provide the maximum reasonable and foreseeable roadway needed beyond a 20-year horizon. The ultimate concept can be used to identify potential widening, realignments, future facilities, and rights-of-way required to complete the development of each corridor.

**Urban Area** – An area with a population of 50,000 or more people as defined by the US Census Bureau.
Urban Cluster – 2,500 to 49,999 in population designates an urban cluster. Limits are based upon population density as determined by the U.S. Census Bureau.

VMT – Is the total number of miles traveled by motor vehicles on a road or highway segments.

**APPENDIX B: RESOURCES**


California Department of Transportation, District 3, *District System Management Plan Project List*, July 2013. Website: [M:\Plan\Shared\File Structure Project\System Planning\DSMDP\2012-13 Update\DSMP Project List](M:\Plan\Shared\File Structure Project\System Planning\DSMDP\2012-13 Update\DSMP Project List)


California Department of Transportation: District 3, *Transportation Corridor Concept Report State Route 113*, 2010


Sacramento Area Council of Governments *2035 Metropolitan Transportation Plan*


Yolo County *2030 Countywide General Plan*

Yuba-Sutter Census Economic and Demographic Information, 2013

County of Yolo *2013 Bicycle Transportation Plan*, [http://www.yolocounty.org/home/showdocument?id=2538](http://www.yolocounty.org/home/showdocument?id=2538)

**Endnotes:**


2 [http://www.leginfo.ca.gov/cgi-bin/displaycode?section=shc&group=00001-01000&file=250-257](http://www.leginfo.ca.gov/cgi-bin/displaycode?section=shc&group=00001-01000&file=250-257)
INTRODUCTION

This document constitutes the Mitigation Monitoring and Reporting Program (MMRP) for the Environmental Impact Report (EIR) on the Sacramento Area Council of Government (SACOG) 2016 Metropolitan Transportation Plan and Sustainable Communities Strategy (MTP/SCS) Project.

The California Environmental Quality Act (CEQA) requires public agencies to report on and monitor measures adopted as part of the environmental review process (Public Resources Code section 21081.6 and CEQA Guidelines sections 15091(d) and 15097). This MMRP is designed to fulfill that requirement.

This MMRP is designed to ensure that the measures identified in the EIR are fully implemented. The MMRP describes the actions that must take place as a part of each measure, the timing of these actions, the entity responsible for implementation, and the agency responsible for enforcing each action. The implementation and monitoring responsibilities, as described in this MMRP, reflect the role of local agencies in making project-level determinations regarding the applicability and feasibility of particular measures based on project-specific circumstances.

As required by Section 21081.6 of the Public Resources Code, the SACOG Custodian of Records is the “custodian of documents and other material” which constitutes the “record of proceedings” upon which the decision to adopt the MTP/SCS is based. Inquiries should be directed to:

   Lanette Espinoza, Custodian of Records
   916 321-9000
   lespinoza@sacog.org

The physical location of this information is:

   SACOG
   1415 L Street, Floor 300
   Sacramento, CA 94814

In order to assist implementation of the mitigation measures, the MMRP includes the following information:
**Mitigation Measure X.X:** The mitigation measures are taken verbatim from the Final EIR.

**Timing/Milestone:** This section specifies the point by which the measure should be completed.

**Responsibility for Oversight:** This section indicates which entity will oversee implementation of the measure, conduct the actual monitoring and reporting, and take corrective actions when a measure has not been properly implemented.

**Implementation of Mitigation Measure:** This section identifies how actions will be implemented and verified.

**Responsibility for Implementation:** This section identifies the entity that will undertake the required action.

Pursuant to PRC Sections 21155.2(a) and (b)(2) and Section 21159.28(a), in order to take advantage of CEQA streamlining benefits allowed under SB 375, projects that seek to tier from the MTP/SCS EIR must incorporate the mitigation measures identified in the MTP/SCS Mitigation Monitoring and Reporting Program or, if the identified mitigation is found to be infeasible based on substantial evidence, the project must incorporate equivalent measures that avoid or mitigate potential impacts to a less than significant level.
MITIGATION MONITORING AND REPORTING PROGRAM

Mitigation Measure AES-1: Reduce sun glare resulting from implementation of new transportation projects.

The implementing agency shall require measures that would minimize and control glare from transportation projects through the adoption of project design features that reduce glare. These features include:

- planting trees along transportation corridors to reduce glare from the sun;
- creating tree wells in existing sidewalks;
- adding trees in new curb extensions and traffic circles;
- adding trees to public parks and greenways; and
- landscaping off-street parking areas, loading areas, and service areas.

Tree species planted to comply with this measure shall provide significant shade cover when mature. Utilities shall be installed underground along these routes wherever feasible to allow trees to grow and provide shade without need for severe pruning.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-1 would result in changes in project design that reduce glare by planting of trees along transportation corridors, sidewalks, curb extensions and traffic circles, greenways, and in parks, and planting landscaping in parking areas, loading areas, and service areas, among other things.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AES-2: Design structures to avoid or reduce impacts resulting from glare.

The implementing agency shall require measures that would minimize and control glare from land use and transportation projects through the adoption of project design features that reduce glare. These features include:
- limiting the use of reflective materials, such as metal;
- using non-reflective material, such as paint, vegetative screening, matte finish coatings, and masonry;
- screening parking areas by using vegetation or trees;
- using low-reflective glass; and
- complying with applicable general plan policies or local controls related to glare.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-2 would result in changes in project design that reduce glare by limiting the use of reflective materials and encouraging the use of non-reflective materials, screening of parking areas, and use of low-reflective glass, among other things.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure AES-3:** Design lighting to minimize light trespass and glare.

The implementing agency shall require measures that would impose lighting standards that ensure that minimum safety and security needs are addressed and minimize light trespass and glare. These standards include the following:

- minimizing incidental spillover of light onto adjacent private properties and undeveloped open space;
- directing luminaries away from habitat and open space areas adjacent to the project site;
- installing luminaries that provide good color rendering and natural light qualities; and
- minimizing the potential for back scatter into the nighttime sky and for incidental spillover of light onto adjacent private properties and undeveloped open space.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be
Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-3 would result in changes in project design that ensure that minimum safety and security needs are met and would minimize light trespass and glare by: controlling lighting to minimize spill-over onto other properties and/or open space, controlling artificial qualities of light (such as color); and shielding lighting to protect the night sky, among other things.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AES-4: Protect panoramic views and views of significant landscape features or landforms.

The implementing agency shall protect panoramic views and views of significant landscape features or landforms by taking the following (or equivalent) actions:

- requiring that the scale and massing of new development in higher-density areas provide appropriate transitions in building height and bulk that are sensitive to the physical and visual character of adjoining neighborhoods that have lower development intensities and building heights;
- ensuring building heights stepped back from sensitive adjoining uses to maintain appropriate transitions in scale and to protect scenic views;
- avoiding electric towers, solar power facilities, wind power facilities, communication transmission facilities and/or above ground lines along scenic roadways and routes, to the maximum feasible extent;
- prohibiting projects and activities that would obscure, detract from, or negatively affect the quality of views from designated scenic roadways or scenic highways; and
- complying with other local general plan policies and local control related to the protection of panoramic or scenic views or views of significant landscape features or landforms.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-4 would
result in changes to project design that protect views by ensuring that scale and massing of new development is sensitive to the physical and visual character of adjoining development, that building height and bulk is transitioned, and that utility features and towers are avoided along scenic routes, among other things.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AES-5: Design river crossings to minimize aesthetic and visual impacts and to protect scenic and panoramic views of significant landscape features and landforms to the greatest feasible extent.

The implementing agency shall design river crossings to protect the important elements of scenic vistas, including panoramic views and views of significant landscape features or landforms. Such design elements could include:

- designing the facility with aesthetics and dimensions which are architecturally pleasing and contextually appropriate for the adjacent neighborhoods;
- designing the facility to not exceed or expand the capacity of the approach roadway; and
- prohibiting design features that obscure, detract from, or negatively affect the quality of views from public viewing areas.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-5 would result in changes in the design of river crossings to ensure that aesthetics and dimensions are architecturally pleasing and contextually appropriate for the adjacent neighborhood, would not exceed or expand the capacity of the approach roadway, and would not include features that obscure, detract from, or negatively affect the quality of views from public viewing areas.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AES-6: Design projects to be visually compatible with surrounding areas.

The implementing agency shall require measures that minimize contrasts in scale and massing between the project and surrounding natural forms and developments. Strategies to achieve this include:
• avoiding large cuts and fills when the visual environment (natural or urban) would be substantially disrupted;
• siting or designing projects to minimize their intrusion into important viewsheds;
• using contour grading to match surrounding terrain;
• developing transportation systems to be compatible with the surrounding environments (e.g., colors and materials of construction material; scale of improvements);
• avoiding the use of non-native landscaping; if exotic vegetation is used, it should be used as screening and landscaping that blends in and complements the natural landscape;
• protecting or replacing trees in the project area;
• using grading that blends with the adjacent landforms and topography;
• landscaping new slopes and embankments with compatible grasses, shrubs, and trees to soften cuts and edges; and
• designing new structures to be compatible in scale, mass, character, and architecture with existing structures.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-6 would result in changes to project design to ensure visual compatibility by avoiding grading that results in large cuts and fill, siting projects to minimize intrusion into important viewsheds, using contour grading to match surround terrain, matching scale, color and materials of transportation systems to be compatible with surrounding environment, avoiding the use of non-native landscaping, and protecting or replacing trees, using grading that blends with adjacent landforms and topography, landscaping new slopes and embankments with compatible vegetation, and designing among other things.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure AES- 7:** Implement Mitigation Measure AES-3.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.
Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-7 would result in changes in project design that ensure that minimum safety and security needs are met and would minimize light trespass and glare by: controlling lighting to minimize spill-over onto other properties and/or open space, controlling artificial qualities of light (such as color); and shielding lighting to protect the night sky, among other things.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AES-8: Reduce the visibility of construction-related activities.

The implementing agency shall reduce the visibility of construction-related activities by taking the following (or equivalent) actions:

- restricting construction activities to permitted hours in accordance with local jurisdiction regulations;
- locating materials and stationary equipment such as generators, compressors, rock crushers, cement mixers, etc. as far from sensitive receptors as possible;
- locating materials and stationary equipment in such a way as to prevent glare, light, or shadow from impacting surrounding uses and minimize blockage of scenic resources; and
- reducing the visibility of construction staging areas by fencing or screening these areas with low-contrast materials consistent with the surrounding environment.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-8 would result in limited hours of construction, location of stationary equipment such as generators, compressors, rock crushers, and cement mixers away from sensitive
receptors, location of materials and equipment so as not to create glare, light, or shadow, or block views, and fencing or screening construction of staging areas with low-contrast materials consistent with the surrounding environment, among other things.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure AES-9:** Implement Mitigation Measure AES-8.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-9 would result in limited hours of construction, location of stationary equipment such as generators, compressors, rock crushers, and cement mixers away from sensitive receptors, location of materials and equipment so as not to create glare, light, or shadow, or block views, and fencing or screening construction of staging areas with low-contrast materials consistent with the surrounding environment, among other things.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure AES-10:** Implement Mitigation Measure AES-8.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-10 would result in limited hours of construction, location of stationary equipment such as generators, compressors, rock crushers, and cement mixers away from sensitive receptors, location of materials and equipment so as not to create glare, light, or shadow, or block views, and fencing or screening construction of staging areas with low-contrast materials consistent with the surrounding environment, among other things.
Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AES-11: Re-vegetate exposed earth surfaces.

The implementing agency shall minimize short-term visual impacts of construction by requiring project sponsors to re-vegetate slopes and exposed earth surfaces at the earliest opportunity during construction.

Timming/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-11 would result in changes to construction methods to minimize short-term visual impacts of construction by revegetating slopes and exposed earth surfaces.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AES-12: Minimize contrasts between the project and surrounding areas.

The implementing agency shall ensure that projects use natural landscaping to minimize contrasts between the projects and surrounding areas. Wherever possible, the implementing agency shall develop interchanges and transit lines at the grade of the surrounding land to limit view blockage. Project designs shall contour the edges of major cut-and-fill slopes to provide a more natural-looking finished profile.

Timming/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-12 would result in changes to project design to ensure that projects use natural landscaping to minimize contrasts between projects and surrounding areas, develop at grade to limit view blockage, and contour edges of major cut-and-fill slopes to provide a more natural-looking finish profile, among other things.
Responsibility for Implementation: Implementing/lead agency and/or developer.

**Mitigation Measure AES-13:** Replace and renew landscaping along roadway corridors and development sites.

The implementing agency shall ensure that project sponsors replace and renew landscaping to the greatest extent possible along corridors with transportation improvements and at development sites. The implementing agency shall ensure that landscaping is planned in new corridors and developments to respect existing natural and man-made features and to complement the dominant landscaping of surrounding areas.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AES-13 would ensure that landscaping along existing roadway corridors and development sites be improved, and that new landscaping respect and complement the dominant landscaping of surrounding areas, among other things.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure AG-1:** Mitigate for loss of farmland.

The implementing agency shall require project proponents to mitigate for loss of farmland by providing permanent protection of in-kind farmland at a 1:1 ratio, in the form of easements, fees, or elimination of development rights/potential.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AG-1 would result in permanent protection of in-kind farmland at a 1:1 ratio, in the form of easement, fees, or elimination of development rights/potential.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.
Mitigation Measure AG-2: Implement Mitigation Measure AG-1.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AG-2 would result in permanent protection of in-kind farmland at a 1:1 ratio, in the form of easement, fees, or elimination of development rights/potential.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AG-3: Design proposed projects to minimize, to the greatest extent feasible, conflicts and inconsistencies with land protected by agricultural zoning or a Williamson Act contract and the terms of the applicable zoning and contract.

Implementing agencies shall require project proponents to:

- Relocate project or corridor realignment, where feasible, to avoid farmland, especially Prime Farmland;
- Minimize severance and fragmentation of agricultural land by constructing underpasses and overpasses at reasonable intervals to provide property access;
- Include berms, buffer zones, setbacks, and fencing to reduce use conflicts between new development and farming uses and to protect the functions of farmland; and
- Implement other feasible conservation tools available from the California Department of Conservation’s Division of Land Resource Protection.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AG-3 would result in changes to project design to ensure that projects avoid farmland and minimize fragmentation of agricultural land, and include buffers to reduce use conflicts.
Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AG-4: Mitigate for loss of forest land or timberland.

The implementing agency shall require project proponents to mitigate for loss of forest land or timberland by requiring permanent protection of in-kind land at a 1:1 ratio, in the form of easements or fees and elimination of development rights/potential.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AG-4 would require permanent protection of in-kind forest land or timberland at a 1:1 ratio, in the form of easement, fees, or elimination of development rights/potential.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AG-5: Minimize conversion of farmland to non-agricultural use.

Implementing agencies shall require project proponents to:

- Design proposed projects to minimize, to the greatest extent feasible, the loss of the highest valued agricultural land.
- Redesign project features to minimize fragmenting or isolating Farmland. Where a project involves acquiring land or easements, ensure that the remaining nonproject area is of a size sufficient to allow economically viable farming operations. The project proponents shall be responsible for acquiring easements, making lot line adjustments, and merging affected land parcels into units suitable for continued commercial agricultural management.
- Reconnect utilities or infrastructure that serve agricultural uses if these are disturbed by project construction. If a project temporarily or permanently cuts off roadway access or removes utility lines, irrigation features, or other infrastructure, the project proponents shall be responsible for restoring access as necessary to ensure that economically viable farming operations are not interrupted.
- Manage project operations to minimize the introduction of invasive species or weeds that may affect agricultural production on adjacent agricultural land. Where a project has the potential to introduce sensitive species or habitats or have other spill-over effects on nearby agricultural lands, the project...
proponents shall be responsible for acquiring easements on nearby agricultural land and/or financially compensating for indirect effects on nearby agricultural land. Easements (e.g., flowage easements) shall be required for temporary or intermittent interruption in farming activities (e.g., because of seasonal flooding or groundwater seepage). Acquisition or compensation would be required for permanent or significant loss of economically viable operations.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AG-5 would result in changes to project design to minimize loss of the highest valued agricultural land, minimize fragmenting or isolating farmland, reconnect utilities and infrastructure that serve agricultural uses, and manage project operations to minimize the introduction of invasive species, acquire easements for introduced sensitive species or habitats, and acquire or compensate for interruption of farming activities or economic loss.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure AG-6:** Inventory innovative ideas and best practices from the RUCS toolkit, USEPA and USDA Supporting Sustainable Rural Communities publication, and other sources and implement a locally appropriate strategy to manage growth issues at the rural-urban interface to support the long-term viability of agriculture in the SACOG region.

The implementing agency shall avoid or minimize general pressure to convert agriculture land at the urban edge to non-agricultural uses by adopting regulations that enforce the innovations and best practices identified to minimize conversion pressures on farmland. Examples of this might include but are not limited to:

- **Agriculture Buffers:** Buffers, generally imposed on new development, can assist in reducing urban land use conflicts with farming operations.

- **Right-to-Farm Ordinances:** These ordinances require project applicants to agree to provide real estate disclosures explaining farmers’ rights to purchasers or lessees as a condition of project approval for projects located in active farming areas. The intent of such an ordinance is to protect farmers from nuisance complaints and enforcement actions.

- **Infill and Redevelopment:** These policies, which are supportive of infill and redevelopment and consistent with the policy objectives of the proposed MTP/SCS and SB 375, would direct population growth to urban communities,
or in established rural communities, thereby reducing pressure to convert agricultural land to development.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AG-6 would result in continued and renewed efforts to manage growth pressures at the rural-urban edge including use of agricultural buffers, right-to-farm ordinances, infill emphasis, and redevelopment, among other things.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure AG-7:** Implement Mitigation Measure AG-4.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AG-7 would require permanent protection of in-kind forest land or timberland at a 1:1 ratio, in the form of easement, fees, or elimination of development rights/potential.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure AG-8:** Minimize construction-related impacts to agricultural and forestry resources.

The implementing agency shall require project proponents to:

- restrict construction activities to permitted hours in accordance with local jurisdiction regulations;
- locate materials and stationary equipment (e.g., generators, compressors, rock crushers, cement mixers) as far from conflicting uses as possible;
locate materials and stationary equipment in such a way as to prevent conflict with agricultural and forestry resources; and

- minimize conflict between construction vehicles and agricultural operations on roads that facilitate agricultural operations.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AG-6 would require that hours of construction be limited, that stationary equipment such as generators, compressors, rock crushers, and cement mixers be located away from conflicting uses, that materials and equipment be located so as not to prevent conflict with agricultural and forestry resources, and that construction vehicles be managed on the road to prevent conflict agricultural vehicles, among other things.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure AIR-1:** Adhere to ARB Handbook siting guidance to the maximum extent possible.

Where sensitive land uses or TAC sources would be sited within the minimum ARB-recommended distances, a screening-level HRA, and, if warranted, a site-specific HRA shall be conducted to determine, based on site-specific and project-specific characteristics, all feasible mitigation and best practices. Identified feasible mitigations and best practices shall be implemented. The HRA protocols of the applicable local air districts shall be followed or, where a district/office does not have adopted protocols, the protocol of SMAQMD or CAPCOA shall be followed. Best practices shall be applied as recommended and applicable, to reduce the impact to a less-than-significant level where feasible. The HRA should give particular attention to the nature of the receptor, recognizing that some receptors are particularly sensitive (e.g., schools, day care centers, assisted living and senior centers, and hospitals) and may require special measures. Examples of best practices that studies have suggested to be effective include:

- install, operate, and maintain in good working order a central heating, ventilation, and air conditioning (HVAC) system or other air intake system in the building, or in each individual unit, that meets or exceeds a minimum efficiency reporting value (MERV) of 13 and includes either high efficiency particulate air (HEPA) filters or American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) certified 85 percent or higher;
• install passive (drop-in) electrostatic filtering systems, especially those with low air velocities (i.e., 1 mile per hour [MPH]) as a part of the HVAC project HVAC system(s);

• maintain, repair, and/or replace the HVAC system on an ongoing and as needed basis or shall prepare an operation and maintenance manual for the HVAC system and the filter, for inclusion in the Covenants, Conditions and Restrictions (CC&Rs) for residential projects and a separate homeowners manual;

• orient air intakes away from TAC sources or provide shields or buffers to the maximum extent possible; maintain a vegetative barrier between new residential units consisting of tree species with year-round foliage and a porosity of 20 or 40 percent wherever feasible; and

• use tiered tree planting between roadways and sensitive receptors wherever feasible, using native, needled (coniferous) species, ensure a permanent irrigation source, and provide permanent funding to maintain and care for the trees.

Additionally, implementing agencies should contact SMAQMD and/or CAPCOA for the most current list of best practices for limiting exposure of sensitive receptors to substantial TAC concentrations consistent with the ARB Handbook.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AIR-1 utilizes existing state protocol to assess appropriate siting of land uses near TAC emitters. Where sensitive land uses or TAC sources would be sited within the minimum ARB-recommended distances, a screening-level HRA, and, if warranted, a site-specific HRA is required to be conducted based on site-specific, project-specific, and receptor-specific characteristics. All feasible mitigation in the form of best practices is required to be implemented. Examples of best practices known at this time to be effective include: installing, operating, and maintaining in good working order a central heating, ventilation, and air conditioning (HVAC) system or other air intake system in the building, or in each individual unit, that meets or exceeds a minimum efficiency reporting value (MERV) of 13 and includes either high efficiency particulate air (HEPA) filters or American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) certified 85 percent or higher; passive (drop-in) electrostatic filtering systems, especially those with low air velocities (i.e., 1 MPH) as a part of the HVAC project HVAC system(s); maintaining, repairing, and/or replacing the HVAC system on an ongoing and as needed basis or preparing an
operation and maintenance manual for the HVAC system and the filter, for inclusion in the Covenants, Conditions and Restrictions (CC&Rs) for residential projects and a separate homeowners manual; orientation of air intakes away from TAC sources or providing shields and buffers; and, tiered tree planting between roadways and sensitive receptors using native, needled (coniferous) species with permanent irrigation and permanent funding for maintain and care of the trees.

Implementing agencies should contact SMAQMD and/or CAPCOA for the most current list of best practices for limiting exposure of sensitive receptors to substantial TAC concentrations consistent with the ARB Handbook.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AIR-2: Implementing agencies shall require assessment of new and existing odor sources for individual land use projects to determine whether sensitive receptors would be exposed to objectionable odors and apply recommended applicable mitigation measures as defined by the applicable local air district and best practices.

Examples of mitigation measures that may be applied where feasible and necessary to address site-specific impacts, include but not limited to:

- Proposed industrial, commercial, or convenience land uses (e.g., fast-food restaurants, painting operations) that have the potential to emit objectionable odors shall be located as far away as feasibly possible from existing and proposed sensitive receptors and oriented where possible to place buildings or other obstructions between the odor source and downwind receptors.

- The odor-producing potential of land uses shall be considered when the exact type of facility that would occupy industrial, commercial, or convenience areas is determined.

- If an odor-emitting facility is to occupy space in the industrial, commercial, or convenience area, the odor-producing potential of the source and potential control devices shall be determined in coordination with the local air district and shall be based on the number of complaints associated with existing sources of the same nature. Odor-control devices (e.g., wet chemical scrubbers, HVAC filters, activated carbon scrubbers, biologically active filters, enclosures) shall be identified in the improvement plans before the approval of building permits. The odor-control devices shall be installed before the issuance of certificates of occupancy for the potentially odor-producing use.

- Require notification to incoming property owners (e.g., real estate disclosures) regarding the existence of pre-existing odor-emitting facilities or operations (e.g., similar to aviation easements for noise).

Also, see specifically SMAQMD’s Guide to Air Quality Assessment in Sacramento County (SMAQMD, 2009). Chapter 7 of the SMAQMD guide provides an extensive list of technology- and design based odor reduction measures.
**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AIR-2 would result in siting of odor emitting uses away from sensitive receptors, and/or downwind of receptors, consideration of odor emissions as a factor in locating businesses within a center, early identification and installation of odor-control devices/technologies, and use of odor disclosures, among other things.

Implementing agencies should refer to Chapter 7 of the SMAQMD Guide to Air Quality Assessment in Sacramento County for technology- and design-based odor reduction measures.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure AIR-3:** Implementing agencies shall require recommended applicable mitigation measures as defined by the applicable local air district.

Implementing agencies shall require projects that exceed the long-term operational thresholds to mitigate the air quality impacts using all applicable and feasible mitigation.

Examples of mitigation measures include, but are not limited to:

- provide for the use of energy-efficient lighting and process systems (e.g., low-NOx water heaters, furnaces, and boiler units);
- use EPA Phase II-certified devices for all newly installed woodburning devices;
- design streets to maximize pedestrian access to transit stops;
- include bus shelters at transit access points where deemed appropriate by local public transit operator in large residential, commercial, and industrial projects;
- contribute to traffic-flow improvements (e.g., right-of-way, capital improvements) that reduce traffic congestion;
- equip residential structures with electric outlets in the front and rear of the structure to facilitate use of electrical lawn and garden equipment;
- provide for, or contribute to, dedication of land for off-site Class I and Class II bicycle trails linking the project to designated bicycle commuting routes in accordance with the regional bikeway master plan;
contribute to the provision of synchronized traffic signals on roadways affected by the project and as deemed necessary by the local public works department;

provide transit-enhancing infrastructure that includes bus turnouts or bulbs, passenger benches, street lighting, route signs and displays, and shelters as demand and service routes warrant, subject to review and approval by local transportation planning agencies;

provide pedestrian-enhancing infrastructure that includes sidewalks and pedestrian paths, direct pedestrian connections, street trees to shade sidewalks, pedestrian safety designs and infrastructure, street furniture and artwork, street lighting, pedestrian signalization and signage, and/or access between bus service and major transportation points within the project;

include neighborhood park(s) or other recreational options, such as trails, within the development to minimize vehicle travel to off-site recreational and/or commercial uses;

install solar water heaters;

incorporate mixed uses, where permitted by local development regulations, to achieve a balance of commercial, employment, and housing options on the project site;

include neighborhood telecommunications/telework centers;

contribute to traffic-flow improvements (e.g., right-of-way, capital improvements) that reduce traffic congestion and do not substantially increase roadway capacity;

provide preferential parking spaces for carpool and vanpool vehicles, implement parking fees for single-occupancy vehicle commuters, and implement parking cash-out program for employees;

use clean fuel vehicles in the vehicle fleet;

require all employment centers to include an adequate number of on-site shower/locker facilities for bicycling and pedestrian commuters (typically one shower and three lockers for every 25 employees per shift);

construct/contribute to bicycle and pedestrian facility improvements;

provide ancillary services (e.g., cafeterias, health clubs, automatic tellers, and post offices) within walking distance of proposed development (no further than 1,500 feet) as appropriate and in compliance with local development regulations;

provide park-and-ride lots as deemed feasible and appropriate by transportation planning agencies;

employment centers that exceed a designated size, as measured by the number of employees, shall provide on-site child care and after-school facilities or contribute to off-site construction of such facilities within walking
distance of employment land uses (for employment centers on or adjacent to industrial land uses, on-site child daycare centers shall be provided only if supported by the findings of a comprehensive HRA performed in consultation with the local air district);

- provide on-site pedestrian facility enhancements, such as walkways, benches, proper lighting, vending machines, and building access that are physically separated from parking lot traffic;
- offer alternative work schedules, where practical, that allow for work hours that are compressed into fewer than 5 days (e.g., 9/80, 4/40, or 3/36 schedules), or allow flextime schedules;
- provide transit amenities (e.g., on-site and off-site bus turnouts, passenger benches, or shelters) where deemed appropriate by local transportation planning agencies;
- contribute to the provision of synchronized traffic signals on roadways affected by the proposed project and as deemed necessary by the local public works department;
- provide video conferencing facilities;
- commit to support programs that include guaranteed ride home, subsidized transit passes, and rideshare matching;
- provide transportation (e.g., shuttles) to major transit stations and multimodal centers;
- require each employer employment center (more than 25 employees) to assign a transportation coordinator for the applicable Transportation Management Association (TMA);
- require all employers to install a permanent display in employee common areas of alternate transit information, as determined by the requirements of the TMA;
- require employers or employment centers (more than 25 employees) to implement a guaranteed ride home program;
- require employers or employment centers (more than 25 employees) to implement an incentive program for riding transit, carpooling, vanpooling, biking, and walking instead of driving a single-occupancy vehicle to work, and design and locate buildings to facilitate transit access;
- install Energy Star (or equivalent) cool roofing systems on all buildings;
- design shuttle and transit exits to adjoining streets to reduce time to reenter traffic from the project site;
- increase wall and attic insulation to 20 percent above Title 24 requirements (residential and commercial);
• orient buildings to take advantage of solar heating and natural cooling, and use passive solar designs (residential, commercial, and industrial);
• provide energy-efficient windows (double pane and/or Low-E) and awnings or other shading mechanisms for windows, porches, patios, and walkways;
• consider passive solar cooling and heating designs, ceiling and whole house fans, and programmable thermostats in the design of heating and cooling systems; and
• use daylight lighting systems, such as skylights, light shelves, and interior transom windows.

See also SMAQMD's most recent version of the Recommended Guidance for Land Use Emission, currently version 3.2 (SMAQMD, 2015a).

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AIR-3 would result in implementation of a variety of changes in project design and operation listed above that would mitigate air quality emissions to acceptable levels.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure AIR-4: Implementing agencies shall require project applicants to implement applicable, or equivalent, standard construction mitigation measures as defined by the applicable local air district.

Lead agencies shall require project applicants, prior to construction, to implement construction mitigation measures that, at a minimum, meet the requirements of the applicable air district with jurisdiction over the area in which construction activity would occur if the project is anticipated to exceed thresholds of significance for short-term criteria air pollutant emissions. Projects that exceed these thresholds shall mitigate the air quality impacts using all applicable and feasible mitigation. For construction activity on the project site that is anticipated to exceed thresholds of significance, the project applicant(s) shall require construction contractors to implement both Standard Mitigation Measures and Best Available Mitigation Measures for Construction Activity to reduce emissions to the maximum extent applicable and feasible for all construction activity performed in the plan area.

Examples of mitigation measures could include, but not limited to, the following:
• The applicant shall implement a Fugitive Dust Control Plan.

• All grading operations on a project shall be suspended when winds exceed 20 MPH or when winds carry dust beyond the property line despite implementation of all feasible dust control measures.

• Construction sites shall be watered as directed by the local air district and as necessary to prevent fugitive dust violations.

• An operational water truck shall be on-site at all times. Water shall be applied to control dust as needed to prevent visible emissions violations and off-site dust impacts.

• On-site dirt piles or other stockpiled particulate matter shall be covered, wind breaks installed, and water and/or soil stabilizers employed to reduce wind-blown dust emissions. The use of approved nontoxic soil stabilizers shall be incorporated according to manufacturers’ specifications to all inactive construction areas.

• All transfer processes involving a free fall of soil or other particulate matter shall be operated in such a manner as to minimize the free fall distance and fugitive dust emissions.

• Approved chemical soil stabilizers shall be applied according to the manufacturers’ specifications to all inactive construction areas (previously graded areas that remain inactive for 96 hours), including unpaved roads and employee/equipment parking areas.

• To prevent track-out, wheel washers shall be installed where project vehicles and/or equipment exit onto paved streets from unpaved roads. Vehicles and/or equipment shall be washed before each trip. Alternatively, a gravel bed may be installed as appropriate at vehicle/equipment site exit points to effectively remove soil buildup on tires and tracks and prevent/diminish track-out.

• Paved streets shall be swept frequently (water sweeper with reclaimed water recommended; wet broom permitted) if soil material has been carried onto adjacent paved, public thoroughfares from the project site.

• Temporary traffic control shall be provided as needed during all phases of construction to improve traffic flow, as deemed appropriate by the appropriate department of public works and/or California Department of Transportation (Caltrans), and to reduce vehicle dust emissions. An effective measure is to enforce vehicle traffic speeds at or below 15 MPH.

• Traffic speeds on all unpaved surfaces shall be reduced to 15 MPH or less, and unnecessary vehicle traffic shall be reduced by restricting access. Appropriate training to truck and equipment drivers, on-site enforcement, and signage shall be provided.

• Ground cover shall be reestablished on the construction site as soon as possible and before final occupancy through seeding and watering.
• Open burning shall be prohibited at the project site. No open burning of vegetative waste (natural plant growth wastes) or other legal or illegal burn materials (e.g., trash, demolition debris) may be conducted at the project site. Vegetative wastes shall be chipped or delivered to waste-to-energy facilities (permitted biomass facilities), mulched, composted, or used for firewood. It is unlawful to haul waste materials off-site for disposal by open burning.

• The primary contractor shall be responsible for ensuring that all construction equipment is properly tuned and maintained before and for the duration of on-site operation.

• Existing power sources (e.g., power poles) or clean-fuel generators shall be used rather than temporary power generators.

• A traffic plan shall be developed to minimize traffic flow interference from construction activities. The plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service. Operations that affect traffic shall be scheduled for off-peak hours. Obstruction of through-traffic lanes shall be minimized. A flag person shall be provided to guide traffic properly and ensure safety at construction sites.

• The project proponent shall assemble a comprehensive inventory list (i.e., make, model, engine year, horsepower, emission rates) of all heavy-duty off-road (portable and mobile) equipment (50 horsepower and greater) that will be used an aggregate of 40 or more hours for the construction project and provide a plan for approval by the local air district demonstrating that the heavy-duty (equal to or greater than 50 horsepower) off-road equipment to be used for construction, including owned, leased, and subcontractor vehicles, will achieve a project-wide fleet-average 20 percent NO\textsubscript{X} reduction and 45 percent particulate reduction compared to the most recent ARB fleet average at the time of construction. These equipment emission reductions can be demonstrated using the most recent version of the Construction Mitigation Calculator developed by the SMAQMD. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology (Carl Moyer Guidelines), after-treatment products, voluntary off-site mitigation projects, the provision of funds for air district off-site mitigation projects, and/or other options as they become available. In addition, implementation of these measures would also result in a 5 percent reduction in ROG emissions from heavy-duty diesel equipment. The local air district shall be contacted to discuss alternative measures.

Air districts provide similar recommendations to those listed above. Some air districts in the region (e.g., SMAQMD) also offer the option for paying off-site construction mitigation fees if the recommended actions do not reduce construction emissions to acceptable levels.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.
Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure AIR-4 would result in changes in construction methods listed above that would mitigate construction-related air quality emissions to feasible levels.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure BIO-1a: Avoid, minimize, and mitigate impacts on special-status plant species.

Measures that shall be implemented at a project-level, where feasible and necessary to address site-specific impacts, to reduce the impacts to special-status plant species include but are not limited to:

- Projects covered by conservation plans or that are able to utilize take permits under such plans shall abide by the terms of the plan/permit. For all other projects and for non-covered species the following shall apply, dependent on the findings of project specific biological resources assessment.
- Biological resources assessments for specific projects proposed will be prepared in areas containing, or likely to contain, habitat for special-status plants.
- Prior to project initiation and during the blooming period for the special-status plant species with potential to occur in the proposed project site, a qualified botanist will conduct protocol-level surveys for special-status plants in areas where potentially suitable habitat would be removed or disturbed by project activities. If no special-status plants are found, the botanist will document the findings in a letter report to USFWS, CDFW, and the implementing agency.
- If special-status plant species are found that cannot be avoided during construction, the project applicant will consult with CDFW and/or USFWS, as appropriate depending on species status, to determine the appropriate mitigation measures for direct and indirect impacts that could occur as a result of project construction and will implement the measures to achieve no net loss of occupied habitat or individuals. Measures may include preserving and enhancing existing populations, creating offsite populations on project mitigation sites through seed collection or transplantation, and/or restoring or creating suitable habitat in sufficient quantities to achieve no net loss of occupied habitat and/or individuals. A mitigation and monitoring plan will be developed describing how unavoidable losses of special-status plants will be compensated.
- If relocation efforts are part of the mitigation plan, the plan will include details on the methods to be used, including collection, storage, propagation,
receptor site preparation, installation, long-term protection and management, monitoring and reporting requirements, success criteria, and remedial action responsibilities should the initial effort fail to meet long-term monitoring requirements.

- Success criteria for preserved and compensatory populations will include:
  - The extent of occupied area and plant density (number of plants per unit area) in compensatory populations will be equal to or greater than the affected occupied habitat.
  - Compensatory and preserved populations will be self-producing. Populations will be considered self-producing when:
    - plants reestablish annually for a minimum of five years with no human intervention such as supplemental seeding; and
    - reestablished and preserved habitats contain an occupied area and flower density comparable to existing occupied habitat areas in similar habitat types in the project vicinity.

- If offsite mitigation includes dedication of conservation easements, purchase of mitigation credits, or other offsite conservation measures, the details of these measures will be included in the mitigation plan, including information on responsible parties for long-term management, conservation easement holders, long-term management requirements, success criteria such as those listed above and other details, as appropriate to target the preservation of long term viable populations.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure BIO-1a would result in participation in adopted species conservation plans with mitigation consistent with the terms of those plans, or the preparation of project-specific biological resource assessments with avoidance of special-status species where feasible, and where avoidance is not feasible, mitigation consistent with local, state, and federal requirements as described above.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure BIO-1b:** Avoid, minimize, and mitigate impacts on special-status wildlife species.

Measures that shall be implemented, where feasible and necessary to avoid site-specific
impacts, to reduce the impacts to special-status wildlife species include but are not limited to:

- Projects covered by conservation plans or that are able to utilize take permits under such plans shall abide by the terms of the plan/permit. For all other projects and for non-covered species the following shall apply, dependent on the findings of the project specific biological resources assessment.

- A biological resources assessment for specific project proposed will be prepared in areas containing, or likely to contain, habitat for special-status species in areas where potentially suitable habitat would be removed or disturbed by project activities.

- Where federally or stated listed species will be affected by construction activities, the project applicant will adhere to regulatory guidelines and policies that identify specific avoidance and minimization measures to insure that these actions do not result in the take of a listed species, except as authorized under a USFWS Biological Opinion or Incidental Take Permit or a CDFG Incidental Take Permit.

- If special-status species or their habitat are found and cannot be avoided during construction, the project applicant will consult with CDFW, USFWS, and/or NMFS, as appropriate depending on species status, to determine the appropriate avoidance, minimization and mitigation measures for direct and indirect impacts that could occur as a result of project construction and will implement the measures to minimize the impact. Minimization and mitigation measures may include implementation of seasonal work windows to avoid or minimize impacts to wildlife species, implementation of a workers environmental awareness training, implementation of buffer areas to minimize disturbance, biological construction monitoring, and preservation, restoration, or creation of special-status wildlife habitat, where appropriate and feasible. If habitat compensation is required, mitigation will occur at an agency approved mitigation bank or through individual mitigation locations as approved by USFWS and/or CDFW. Examples of representative minimum replacement rations are presented below in Table 6.12. A mitigation and monitoring plan will be developed describing how unavoidable losses of special status wildlife will be compensated. The mitigation and monitoring plan will include how the site will be monitored and the duration of monitoring until the mitigation is considered to be successful.

- All mitigation areas should be preserved in perpetuity through either fee ownership or a conservation easement held by a qualified conservation organization or agency, establishment of a preserve management plan, and guaranteed long-term funding for site preservation through the establishment of a management endowment.
<table>
<thead>
<tr>
<th>Species</th>
<th>Creation/Restoration Mitigation Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vernal pool fairy shrimp and vernal pool tadpole (would mitigate for other vernal pool species)¹</td>
<td>Preservation: 2:1 (for direct or indirect impacts) in approved banks, 3:1 in non-bank.*</td>
</tr>
<tr>
<td></td>
<td>Creation/ Restoration: 1:1 (2:1 if based on Service evaluation of site-specific conservation values) in approved banks, 2:1 in non-bank.*</td>
</tr>
<tr>
<td></td>
<td>*Mitigation ratios for non-bank mitigation may be adjusted to approach those for banks based on Service evaluation.</td>
</tr>
<tr>
<td>Valley elderberry longhorn beetle²</td>
<td>Transplant directly affected shrubs to a USFWS approved conservation bank and purchase conservation credits depending on stem size and shrub location Plant seedlings and associated riparian at stem placement ratios from 1:1 to 8:1, depending on stem size and shrub location.</td>
</tr>
<tr>
<td>California tiger salamander</td>
<td>No net loss of habitat through restoration, preservation, or compensation.</td>
</tr>
<tr>
<td>California red-legged frog</td>
<td>No net loss of habitat through restoration, preservation, or compensation.</td>
</tr>
<tr>
<td>Sierra Nevada yellow-legged frog</td>
<td>No net loss of habitat through restoration, preservation, or compensation.</td>
</tr>
<tr>
<td>Giant garter snake³</td>
<td>Preservation: All replacement habitat must include both upland and aquatic habitat at a ratio of 2:1 upland acres to aquatic acres Creation/Restoration: From 1:1 to 3:1 depending on nature of impact.</td>
</tr>
<tr>
<td>Burrowing owl⁴</td>
<td>Varies depending on site conditions, consultation with CDFW is required. Create artificial burrows if necessary. Prepare a mitigation management plan and vegetation management goals in consultation with CDFW.</td>
</tr>
<tr>
<td>Swainson’s hawk⁵</td>
<td>Depending on nest location with respect to project (typically 0.5:1 to 1.5:1), or participate in County sponsored Swainson’s Hawk Mitigation Program if developed.</td>
</tr>
</tbody>
</table>

¹ Mitigation ratios are based on the Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California (Service file number 1-1-96-F-1) (USFWS, 1996).
² Conservation Guidelines for Valley Elderberry Longhorn Beetle (USFWS, 1999).
³ Programmatic Consultation with the U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California (Service file number 1-1-F-97-149) (USFWS, 1997).
⁴ Staff Report on Burrowing Owl Mitigation (CDFG, 2012).
⁵ Staff Report Regarding Mitigation for Impacts to Swainson’s Hawks (Buteo swainsoni) in the Central Valley of California (CDFG, 1994).

The implementing agency would require applicants to mitigate at the above ratios or greater depending on habitat quality, other impacts to the species, and other factors deemed important by the agencies.

The following are species specific mitigation measures typically implemented and implementation will be dependent on the findings of project-specific biological resources assessment.

**Vernal Pool Invertebrates**
If the proposed project identifies the potential for special status vernal pool invertebrates to be affected by project activities, the following measures will be implemented where feasible and necessary to avoid site-specific impacts:
Prior to project construction, the implementing agencies will consult with the USACE and USFWS pursuant to Section 7 of the ESA and retain a Biologist to conduct vernal pool invertebrate surveys within the proposed project and within 250 feet from the edge of the proposed project to evaluate direct and indirect effects to vernal pools as provided in the Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans within the Jurisdiction of the Sacramento Field Office, California (USFWS, 1996).

A worker environmental awareness training will be conducted to inform onsite construction personnel regarding the potential presence of listed species and the importance of avoiding impacts to these species and their habitat.

The implementing agencies will secure any necessary take authorization prior to project construction through formal consultation between USACE and USFWS pursuant to Section 7 of the ESA, and will implement all measures included in the Biological Opinion issued by USFWS.

Habitat Preservation: The implementing agencies will compensate for direct effects of the project on the habitat for vernal pool invertebrates at a sufficient ratio for no net loss of habitat function or acreage, by purchasing vernal pool preservation credits from a USFWS-approved conservation bank, or from another USFWS-approved conservation bank. Compensation credits will be purchased prior to any ground-disturbing activities.

Habitat Creation: The implementing agencies will compensate for the direct effects of the project on the habitat for vernal pool crustaceans at a sufficient ratio for no net loss of habitat function or acreage, by purchasing vernal pool creation credits from a USFWS-approved conservation bank, or from another USFWS-approved conservation bank.

For seasonal wetlands and drainages that will be retained in the project area (i.e., those not proposed to be filled), a minimum setback of at least 50 feet from these features will be avoided in the project area. The buffer area will be fenced with high visibility construction fencing prior to commencement of ground-disturbing activities, and will be maintained for the duration of construction activities.

Valley Elderberry Longhorn Beetle
If the proposed project identifies potential for valley elderberry longhorn beetle or identifies elderberry shrubs to be affected by project activities the following measures will be implemented:

Prior to any ground disturbing activities, a qualified Biologist will identify all elderberry shrubs within the footprint and a 100-foot buffer around of the proposed activity. The qualified Biologist will survey potentially affected shrubs for valley elderberry longhorn beetle (VELB) exit holes in stems greater than one inch in diameter.
If elderberry shrubs are found on or adjacent to the site, a 100-foot wide avoidance buffer (measured from the dripline of the plant) will be established around all elderberry shrubs with stems greater than 1-inch diameter at ground level and will be clearly identified in the field by staking, flagging, or fencing. No construction activities involving mechanized equipment will occur within the buffer areas. Human access may be permitted in the buffer, provided that it does not cause disturbance to the shrubs.

If impacts to VELB habitat cannot be avoided, the implementing agencies will consult with USFWS to determine appropriate compensation ratios. Compensatory mitigation measures will be consistent with the Conservation Guidelines for Valley Elderberry Longhorn Beetle (USFWS, 1999), or current guidance.

Compensatory mitigation for adverse effects may include the transplanting of elderberry shrubs during the dormant season (November 1 to February 15), if feasible, to an area protected in perpetuity as well as required additional elderberry and associated native plantings as approved by the USFWS.

If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be included in the mitigation plan and must occur with full endowments for management in perpetuity. The plan will include information on responsible parties for long-term management, holders of conservations easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.

**Amphibians and Reptiles**

If the proposed project identifies potential for special status amphibians or reptiles (e.g., California tiger salamander (CTS), California red-legged frog (CRLF), Sierra Nevada yellow-legged frog (SNYLF), foothill yellow-legged frog (FYLF), western spadefoot toad (WST), giant garter snake (GGS), coast horned lizard (CHL) or western pond turtle (WPT)) to be affected by project activities, the following measures will be implemented where feasible and necessary to avoid site-specific impacts:

- A habitat assessment will be conducted following USFWS and/or CDFW guidance on site assessments and field surveys for the suspected species. If no guidance has been developed (e.g., SNYLF, CHL), the implementing agencies will consult with CDFW and/or USFWS, as appropriate depending on species status, to determine the appropriate survey protocol. The findings of the survey(s) will be provided to the USFWS and CDFW, as appropriate to the species regulatory status.
- For projects that may result in take of federally listed species (e.g., CRLF, CTS, SNYLF, and GGS), USFWS will be consulted. CDFW will also be consulted regarding take of species that are also state listed (e.g., CRLF, CTS, and SNYLF).
- GGS - The activities may qualify to use the “Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with
Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California” (USFWS, 1999). The Habitat Replacement & Restoration Guidelines (Appendix A), Items Necessary for Formal Consultation (Appendix B), Avoidance & Minimization Measures During Construction (Appendix C), and Monitoring Requirements (Appendix D) will be followed.

- The following measures will be implemented, at a minimum, in addition to any measures identified through consultation with USFWS, pursuant to ESA, and CDFW, pursuant to CESA.

California tiger salamander and California red-legged frog minimization measures:

- No later than 30 days prior to commencement of any construction activities between October 15 and May 15, including land clearing, in that portion of the site identified as potential dispersal habitat for CTS, and CRLF, exclusion fencing will be installed along the perimeter of that portion of the project site identified as dispersal habitat. One-way escape funnels will be installed at ground level every 50 feet within the exclusion fencing to allow any migrating amphibian or reptile within the project area to pass through the exclusion fencing. If construction activities occur between October 15 and May 15, the exclusion fencing will be maintained intact through May 15. No exclusion fencing is required if no construction activities occur between October 15 and May 15 within that portion of the project site identified as potential dispersal habitat.

- A qualified Biologist will conduct a pre-construction survey prior to commencement of construction activities, including land clearing, within that portion of the project site identified as potential dispersal habitat. If any special-status amphibian or reptile is identified on-site, work in the vicinity of the individual will not commence until the individual has been removed from the project site by a qualified Biologist and released near a suitable habitat or burrow at least 300 feet from the project site. Any aestivation burrows (defined as two or more small mammal burrows greater than 1 inch in diameter within a 10-foot diameter area within the identified dispersal habitat) will be excavated by hand and individual animals released near a suitable burrow at least 300 feet from the project site.

- Vegetation will be hand cleared in areas where CTS and/or CRLF are suspected to occur.

- Trenches and holes will be covered and inspected daily for stranded animals. Trenches and holes deeper than one foot deep will contain escape ramps (maximum slope of 2:1) to allow trapped animals to escape uncovered holes or trenches. Holes and trenches will be inspected prior to filling.

- A qualified Biologist will conduct a survey daily during initial construction and land clearing activities in that portion of the project site identified as potential dispersal habitat. If special-status amphibians or reptiles are found, the
Biologist will implement the same removal methods identified in the above paragraph.

- From October 15 to May 31 within the potential dispersal habitat identified on the project site, minimize operation of project vehicles and equipment at night off established roads during rain events and within 24 hours following rain events, and check under vehicles parked overnight off established roads before operation.

Sierra Nevada yellow-legged frog minimization measures:

- A qualified Biologist will conduct a pre-construction survey prior to commencement of construction activities, including land clearing, within that portion of the project site identified as potential dispersal habitat. If any special-status amphibian or reptile is identified on-site, work in the vicinity of the individual will not commence until the individual has left the site or has been removed from the project site by a qualified Biologist and released near a suitable habitat at least 300 feet from the project site.

- A qualified biologist will be present during the grubbing and clearing activities in the riparian and aquatic habitat in the project area.

- For projects that include water work, egg and tadpole survey will be conducted. If SNYLF eggs or tadpoles are identified in the work area or within 250 feet downstream of the work area, USFWS and CDFW will be notified and the water quality will be monitored so that the activity does not directly or indirectly disturb eggs or tadpoles.

Giant garter snake minimization measures:

- All ground-disturbing construction activities within 200 feet of aquatic habitat (e.g., irrigation ditches, low flowing streams, and associated seasonal wetlands) suitable for giant garter snakes will be conducted during the snake's active season of May 1 to October 1 so that snakes can move and avoid danger. For any construction outside of this period, USFWS will be consulted to determine whether additional measures are necessary to avoid or minimize potential impacts during the inactive season and avoid take.

- GGS habitat within or adjacent to the Project site will be flagged, staked, or fenced and designated as a no-construction area. No activity will occur within this area and USFWS-approved biological monitoring will be conducted to ensure that avoidance measures are being implemented.

- Vegetation will be hand cleared in areas where GGS are suspected to occur.

- Heavy equipment and vehicular movement within 200 feet of the banks of aquatic habitat will be restricted to existing access roads and the predetermined staging and construction sites to minimize habitat disturbance.

- In areas where wetlands, irrigation ditches, or other potential giant garter snake habitats are being retained on the site:
A qualified Biologist will direct the installation of temporary exclusion fencing around suitable upland habitat within 200 feet of aquatic habitat to prevent giant garter snakes from entering the work area during construction. The fencing will be maintained for the duration of the construction activities;

- Ground disturbance, spoils, and equipment storage and other project activities will not be allowed within the fenced area; and

- The water quality will be maintained and construction runoff into wetland areas will be limited through the use of hay bales, filter fences, vegetative buffer strips, or other accepted equivalents. However, no plastic, monofilament, jute, or similar matting to control erosion that could entangle snakes will be placed in the project area.

- If wetlands, irrigation ditches, or other potential giant garter snake habitat would be filled, the aquatic habitats will be dewatered at least 15 days before fill. Dewatering of aquatic habitat for construction purposes will not occur between October 1 and April 15, with the exception of any areas within a cofferdam, unless authorized by USFWS. Any dewatered habitat must remain dry for at least 15 consecutive days after April 15 and before excavation or filling of the dewatered habitat. If GGS are observed, the species will be allowed to move out of the area on its own and will not be captured or relocated unless authorized by USFWS.

- Within 24 hours before beginning construction activities within 200 feet of suitable aquatic habitat for giant garter snakes, a qualified Biologist will inspect areas of anticipated disturbance for the presence of giant garter snakes. The construction area will be reinspected whenever a lapse in construction activity of two weeks or more has occurred. The monitoring Biologist will be available thereafter; if a snake is encountered during construction activities, the monitoring Biologist will have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. Giant garter snakes encountered during construction activities should be allowed to move away from construction activities on their own.

- Trenches and holes will be covered and inspected daily for stranded animals. Trenches and holes deeper than one foot deep will contain escape ramps (maximum slope of 2:1) to allow trapped animals to escape uncovered holes or trenches. Holes and trenches will be inspected prior to filling.

- After completion of project-related construction activities, any temporary fill and construction debris will be removed, and wherever feasible, disturbed areas will be restored to pre-project conditions. For any fill or debris that could be used as snake refugia, removal will occur prior to giant garter snake inactive season (October 2 to April 30), or potential refugia removed after that date must be surveyed for the presence of snakes by a qualified Biologist prior to removal.
Western pond turtle minimization measures:

- Pre-construction surveys for WPT will be conducted by a qualified Biologist 14 days before and 24 hours before the start of ground-disturbing activities where suitable habitat exists (e.g., along riparian areas and freshwater emergent wetlands).
- If WPT or their nests are observed during pre-construction surveys, a qualified Biologist will be on-site to monitor construction in suitable WPT habitat. WPT found within the construction area will be allowed to leave of its own volition or it will be captured by a qualified Biologist and relocated out of harm’s way to the nearest suitable habitat immediately upstream or downstream from the Project site.
- If WPT nests are identified in the work area during pre-construction surveys, a 300-foot no disturbance buffer will be established between the nest and any areas of potential disturbance. Buffers will be clearly marked with temporary exclusion fencing. Construction will not be allowed to commence in the exclusion area until hatchlings have emerged from the nest, or the nest is deemed inactive by a qualified Biologist.

Coast horned lizard minimization measures:

- Focused surveys for the coast horned lizard will be conducted within suitable habitat that may be temporarily disturbed or permanently affected. Survey will be conducted in September/October when the species is more active prior to winter hibernation. The surveys will be conducted in to maximize the likelihood of observing the species, and shall rely on a combination of several walking surveys at times of the day when coast horned lizards are most active. The estimated occupied area will be delineated on a map, flagged in the field, and made available to all project personnel for avoidance.
- If avoidance is not feasible the implementing agency will consult with CDFW to develop a capture and relocation measures.
- A qualified Biologist will direct the installation of temporary exclusion fencing around suitable to prevent coast horned lizard from entering the work area during construction. The fencing will be maintained for the duration of the construction activities;
- Ground disturbance, spoils, and equipment storage and other project activities will not be allowed within the fenced area; and
- If coast horned lizard is found within the construction footprint, it will be allowed to move out of harm’s way of its own volition or a qualified Biologist will relocate the lizard outside of the construction impact area but within suitable habitat.
- Trenches and holes will be covered and inspected daily for stranded animals. Trenches and holes deeper than one foot deep will contain escape ramps (maximum slope of 2:1) to allow trapped animals to escape uncovered holes or trenches. Holes and trenches will be inspected prior to filling.
Western spadefoot toad minimization measures:

- For work conducted during the western spadefoot toad migration and breeding season (November 1 to May 31), a qualified Biologist will survey the active work areas (including access roads) in mornings following measurable precipitation events. Construction may commence once the Biologist has confirmed that no spadefoot toads are in the work area.

- When feasible, there will be a 50-foot no-disturbance buffer around burrows that provide suitable upland habitat for western spadefoot toad. Burrows considered suitable for spadefoot will be identified by a qualified Biologist. The Biologist will delineate and mark the no-disturbance buffer. Burrows that cannot be avoided will be excavated by hand and individual animals released near a suitable burrow at least 300 feet from the project site.

- If western spadefoot toad is found within the construction footprint, it will be allowed to move out of harm’s way of its own volition or a qualified Biologist will relocate the western spadefoot toad to the nearest burrow that is outside of the construction impact area.

- Prior to beginning work each day, a qualified Biologist will inspect underneath equipment and stored pipes greater than 1.2 inches (3 cm) in diameter for western spadefoot toad. If any are found, they will be allowed to move out of the construction area under their own accord.

- Trenches and holes will be covered and inspected daily for stranded animals. Trenches and holes deeper than one foot deep will contain escape ramps (maximum slope of 2:1) to allow trapped animals to escape uncovered holes or trenches. Holes and trenches will be inspected prior to filling.

Foothill yellow-legged frog minimization measures:

- Exclusion fencing will be required for construction activities that occur within that portion of the project site identified as potential habitat.

- If a FYLF is found within the construction footprint, it will be allowed to move out of harm’s way of its own volition or a qualified Biologist will relocate the frog to the nearest suitable habitat area that is outside of the construction impact area.

- Trenches and holes will be covered and inspected daily for stranded animals. Trenches and holes deeper than one foot deep will contain escape ramps (maximum slope of 2:1) to allow trapped animals to escape uncovered holes or trenches. Holes and trenches will be inspected prior to filling.

- If in-stream work activities occur between April 1 and August 31, a FYLF egg and tadpole survey will be conducted. If FYLF eggs or tadpoles are identified in the work area or within 250 feet downstream of the work area, CDFW will be notified and the water quality will be monitored so that the activity does not directly or indirectly disturb eggs or tadpoles.
Mammals

Bats minimization measures:

If the proposed project identifies potential for bats or identifies a bat colony to be affected by project activities, the following measures will be implemented where feasible and necessary to avoid site-specific impacts:

- Surveys will be conducted to determine if areas of potential habitat are occupied by bats. These habitat types should be specifically surveyed if present within the project and within 14 days prior to start of construction. Bats may utilize rocky outcrops; dense tree canopies; snags; bridges over creeks or water; mines, caves, or flumes; cave-like structures; and/or vacant buildings. Surveys may consist of a daytime pedestrian surveys looking for evidence of bat use (e.g., guano) and/or an evening emergence survey to note the presence or absence of bats. The type of survey will depend on the condition of the buildings or habitat. Bat detectors may be used to supplement survey efforts, but are not required. If no evidence of bat roosts are found, then no further study is required. If evidence of bat use is observed, the number and species of bats using the roost will be determined.
  - If surveys confirm bats daytime-roost will be affected by the project, a Bat Exclusion Plan will be developed by the implementing agency and submitted to CDFW for review and approval prior to its implementation. No bat exclusion will occur between March 1 and August 15 (depending on location) which coincides with the maternity season in California.
  - If a winter roost or a maternity roost is found, a 100-foot buffer will be created around a roost and no project related activities will occur within the buffer until a Biologist has determined that the roost is no longer in use.

Badger minimization measures:

If the proposed project identifies potential for badger or identifies a badger den to be affected by project activities, the following measures will be implemented where feasible and necessary to avoid site-specific impacts:

- If during the biological resources assessment a badger burrow or den is found, a visual survey (i.e. direct observation, monitoring, trail camera, etc.) of the burrow or den will be conducted to determine if the burrow or den is in use. If the burrow or den is determined not to be in use, no further study is required.
- If the burrow or den is found to be in use, the project applicant will consult with CDFW to determine the appropriate avoidance, minimization and mitigation measures for direct and indirect impacts that could occur as a result of project construction and will implement the measures to achieve no net loss of occupied habitat or individuals. Minimization and mitigation
measures may include implementation of seasonal work windows (i.e., avoiding the denning period) to avoid or minimize impacts to the species, implementation of buffer areas to minimize disturbance, biological construction monitoring, passive exclusion, and preservation, restoration, or creation of badger habitat.

- If passive exclusion is use, no disturbance of active dens will take place when cubs may be present and dependent on parental care, as determined by a Biologist. If the Biologist determines that dens may be active but outside of the denning season, the entrances of the dens will be blocked with soil, sticks, and debris for three to five days to discourage the use of these dens prior to project disturbance activities. The den entrances will be blocked to an incrementally greater degree over the three to five-day period. After the qualified Biologist determines that special status mammals have stopped using the active dens, the dens will be hand-excavated with a shovel to prevent re-use during construction.

Special-Status Forest Carnivores minimization measures:

If the proposed project identifies potential for special-status forest carnivores or their dens to be affected by project activities, the following measures will be implemented where feasible and necessary to avoid site-specific impacts:

- Implementing agencies shall implement the following practices identified below for American marten, and apply the same survey practices to the Pacific fisher, Sierra Nevada red fox and California wolverine for land use changes and transportation projects within the range of these species. CDFW shall be notified of the results of the preconstruction surveys and establishment of buffers to avoid discovered dens.
- Pre-project surveys for American marten den sites will be conducted by a wildlife Biologist in suitable denning habitat within 0.25 mile of vegetation removal, construction, and development activities. The results of the surveys shall be made available to CDFW for review and approval prior to site disturbance or construction activity.
- If a potential den is located, an appropriate method will be used to determine whether the site is occupied by marten. Determination of suitability, and whether a pre-project survey is required, should be based on a reconnaissance field assessment of habitat conditions before initiating projects in these areas.
- Survey Timing: April 1 to July 31: If an active marten den site is located during the pre-project surveys or otherwise, notify CDFW. Delay project activities within 500 feet of the den during the sensitive denning season when activities could disturb rearing of young (April 1 through July 31). Although martens are active and can be surveyed year-round, this is considered the sensitive reproductive period that could overlap with timing of project activities. Generally, young are born between March and April, emerge from the den at about 50 days, and leave their mother in late summer.
• Motorized vehicle or construction equipment use will be restricted within 0.25 mile of an active den or concentrated use area

_Birds_

If the proposed project identifies potential for burrowing owl or identifies burrowing owl burrows to be affected by project activities, the following measures will be implemented where feasible and necessary to address site-specific impacts:

• Pre-construction surveys for burrowing owls will be conducted in areas supporting potentially suitable habitat and within 30 days prior to the start of construction activities. If ground-disturbing activities are delayed or suspended for more than 30 days after the pre-construction survey, the site will be resurveyed. The project Biologist will conduct surveys for burrowing owls in accordance with protocols established in the Staff Report on Burrowing Owl Mitigation (CDFG, 2012).

• If burrowing owls are detected, disturbance to burrows will be avoided during the nesting season (February 1 through August 31). Buffers will be established around occupied burrows in accordance with guidance provided in the Staff Report on Burrowing Owl Mitigation. Buffers around occupied burrows will be a minimum of 656 feet (200 meters) during the nesting season, and 160 feet (100 meters) during the non-breeding season.

• Outside of the nesting season (February 1 through August 31), passive owl relocation techniques will be implemented if approved by CDFW. Owls would be excluded from burrows in the immediate impact zone within a 160-foot buffer zone by installing one-way doors in burrow entrances. These doors will be in place at least 48 hours prior to excavation to insure the owls have departed.

• The work area will be monitored daily for one week to confirm owl departure from burrows prior to any ground-disturbing activities.

• Where possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

_Swainson’s hawk minimization measures:_

If the proposed project identifies potential for Swainson’s hawk or identifies Swainson’s hawk nest(s) to be affected by project activities, the following measures will be implemented where feasible and necessary to address site-specific impacts:

• If construction activities occur between February 1 and August 31, the implementing agencies will conduct surveys for Swainson’s hawk in accordance with the Swainson’s Hawk Technical Advisory Committee 2000 guidelines (SHTAC, 2000), or current guidance. Surveys will cover a minimum of a 0.5-mile radius around the construction area. If nesting
Swainson’s hawks are detected, a 0.5-mile no disturbance buffer will be established. Buffers will be maintained until a qualified Biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival.

- If potential nesting trees are to be removed during construction activities, removal will take place outside of Swainson’s hawk nesting season and the implementing agencies will develop a plan, in consultation with CDFW, to replace known nest trees at a ratio of 3:1. If replacement planting is implemented, monitoring will be conducted annually for five years to assess the mitigation’s effectiveness. The plan will include a performance standard for the mitigation that results in a no net loss of nesting habitat.
  - If available, the implementing agencies will participate in a Swainson’s Hawk Mitigation Program to compensate for loss of foraging habitat. If no such program exist, the implementing agencies will consult with CDFW so that affected foraging habitat is replaced at a ratio that results in a no net loss of foraging habitat.

Northern Goshawk and California Spotted Owl minimization measures:

If the proposed project identifies potential for northern goshawk, California spotted owl or identifies northern goshawk or California spotted owl nest to be affected by project activities, the following measures will be implemented where feasible and necessary to address site-specific impacts:

Northern Goshawk

- Pre-project surveys will be conducted in suitable nesting habitat within 0.25 mile of vegetation removal, construction, and development activities prior to site disturbance or construction activity. Surveys for northern goshawks will follow the Northern Goshawk Inventory and Monitoring Technical Guide (Woodbridge and Hargis 2006), or another appropriate method determined by the appropriate regulatory agency. Suitable nesting habitat and whether a pre-project protocol survey is required, should be based on a reconnaissance field assessment of habitat conditions by a qualified avian Biologist before initiating projects in these areas. For efficiency, this assessment could be conducted as part of the pre-project survey, as follows: if suitable habitat is present, continue by implementing the protocol survey; if suitable habitat is not present, no further (protocol) survey would be required.

- Survey timing: June 1 to August 15 (broadcast acoustical surveys or intensive surveys/stand searches) or approximately March 1 to April 15 (dawn acoustical surveys): To avoid disturbances to or loss of active nest sites, between March 15 and August 15, delay project activities within 0.25 mile of (or at a distance directed by the appropriate regulatory agency) the nest to avoid disturbance until the nest is no longer active. Project activities include vegetation removal, earth moving, and construction. This buffer may be reduced through consultation with CDFW. This time frame is based on the
California Forest Practice Rules guidelines and definition of “Critical Period” for northern goshawk.

California Spotted Owl

- Pre-project surveys will be conducted in suitable nesting habitat within 0.25 mile of vegetation removal, construction, and development activities prior to site disturbance or construction activity. Surveys for California spotted owl will follow the Protocol for Surveying for Spotted Owl in Proposed Management Activity Areas and Habitat Conservation Areas (USFS, 1993), or another appropriate method determined by the appropriate regulatory agency. Suitable habitat suitability, and whether a pre-project protocol survey is required, should be based on a reconnaissance field assessment of habitat conditions by a qualified avian Biologist before initiating projects in these areas. For efficiency, this assessment could be conducted as part of the pre-project survey, as follows: if suitable habitat is present, continue by implementing the protocol survey; if suitable habitat is not present, no further (protocol) survey would be required.

- Survey Timing: March 1 to August 31: To avoid disturbances to or loss of active nest sites, between March 1 and August 31, delay project activities within 0.25 mile of (or at a distance directed by the appropriate regulatory agency) the nest to avoid disturbance until the nest is no longer active. Project activities include vegetation removal, earth moving, and construction. This buffer may be reduced through consultation with CDFW.
  - The project applicant shall not remove any trees between September 1 and February 28 that contained active nest sites for California spotted owl or northern goshawk during the breeding season. Once a qualified Biologist has deemed a nest site inactive for two consecutive years, the restriction to protect the nest tree shall be lifted.

Other raptors (e.g., white-tailed kite, northern harrier, owls), minimization measures:

In order to eliminate or reduce impacts to nesting raptor the following mitigation measures are required where feasible and necessary to address site-specific impacts:

- Conduct construction related activities near suitable raptor nesting habitat in the non-breeding season (August 16 to February 14) to the extent practicable.

- If project construction activities, including ground disturbing activities, vegetation trimming or tree removal are scheduled to occur between February 15 and August 15, a pre-construction survey will be conducted within a 500-foot radius of the site to survey for nesting raptors, including ground-nesting raptors (i.e., northern harrier). The survey(s) will occur within seven days of start of construction. If no nesting raptors are found, then no further mitigation is required. If nesting raptors are found the following measures will be implemented:
If nesting raptors are found, the nests and nest trees will be protected with a no construction buffer determined by the project Biologist so that “no take” occurs. The no construction buffer will remain until the young have fledged and are no longer reliant on the nest site or parental care or until the project Biologist determines that the nest is no longer in use.

If MBTA protected species are found nesting, the nests and nest tree/shrub/structure will be protected by a no-construction buffer as determined by the project Biologist so that “no take” occurs and/or until young have fledged and are no longer reliant on the nest site or parental care.

Riparian, marsh, beach or bank nesting birds (e.g. western yellow-billed cuckoo, least Bell’s vireo, willow flycatcher, yellow warbler, yellow-headed blackbird, bank swallow, California least tern, western snowy plover, California clapper rail, California black rail) minimization measures:

If the proposed project identifies potential for special-status riparian, marsh, beach or bank nesting birds or identifies colonies or nests to be affected by project activities, the following measures will be implemented where feasible and necessary to address site-specific impacts:

- If western yellow-billed cuckoo, least Bell’s vireo, willow flycatcher, bank swallow, California least tern, western snowy plover, California clapper rail, California black rail or yellow warbler has the potential to be present within a work area, a qualified Biologist will make an initial site visit to determine if suitable habitat for the species exists within the vicinity of the project footprint.

- Where suitable habitat is present, surveys will be conducted by Biologists adhering to guidance offered in Western Yellow-billed Cuckoo Natural History Summary and Survey Methodology (Halterman et al., 2009); Least Bell’s Vireo Survey Guidelines (USFWS, 2001); A Survey Protocol for Willow Flycatcher in California (Bombay et al., 2003) and/or current industry standards and the implementing agencies will initiate consultation with USFWS and CDFW.

If nests are detected, the implementing agencies will establish buffers around nests that are sufficient to ensure that breeding is not likely to be disrupted or adversely impacted by construction. No-disturbance buffers around active nests will be a minimum of 250 feet, unless a qualified Biologist determines that smaller buffers would be sufficient to avoid impacts to nesting birds. Factors to be considered for determining buffer size will include: the presence of natural buffers provided by vegetation or topography; nest height; locations of foraging territory; and baseline levels of noise and human activity. Buffers will be maintained until a qualified Biologist has determined that young have fledged and are no longer reliant upon the nest or parental care for survival.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable
Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure BIO-1b would result in participation in adopted species conservation plans with mitigation consistent with the terms of those plans, or the preparation of project-specific biological resource assessments with avoidance of special-status species where feasible, and where avoidance is not feasible, mitigation consistent with local, state, and federal requirements as described above.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure BIO-1c: Avoid, minimize, and mitigate impacts on special-status fish species.

Measures that shall be implemented, where feasible and necessary to reduce impacts to special-status species include but are not limited to:

- Projects covered by conservation plans or that are able to utilize take permits under such plans shall abide by the terms of the plan/permit. For all other projects and for non-covered species the following shall apply, dependent on the findings of project-specific biological resources assessment.
- A biological resources assessment for specific projects proposed will be prepared in areas containing, or likely to contain, habitats for special-status fish.
- If habitat is found, but the proposed project will have no impact on the habitat or species, no further study is required. If habitat is present and cannot be avoided, the implementing agencies will initiate consultation with NMFS, USFWS, and/or CDFW, depending on species status.

Measures that shall be implemented, where feasible and necessary to address site-specific impacts, to minimize direct and indirect impacts to special-status fish include but are not limited to:

- Avoidance of special-status fish species and their habitat will be pursued where consistent with the project objectives and where feasible, as defined in Section 15364 of the CEQA Guidelines.
- The implementing agencies will secure any necessary take authorization prior to project construction through consultation NMFS and USFWS pursuant to Section 7 of the ESA if there is a federal action, and will implement all measures included in the Biological Opinion issued by NMFS and/or USFWS. The implementing agencies will also implement all measures provided by CDFW.
- All work within waters where there is potential for Delta smelt to occur, as defined in the most recent USFWS guidance, will be confined to a season...
work window of August 1 through November 30 when Delta smelt are least likely to be present. Because this species does not regulate its movement strictly within this time frame, modification to the work windows may be approved by USFWS prior to project implementation based on information from the various in-Delta monitoring programs.

- In-channel construction activities that could affect designated critical habitat for Central Valley steelhead and/or Chinook salmon will be limited to the low-flow period between June 1 and October 1 to minimize potential for adversely affecting federal listed anadromous salmonids during their emigration period.

- In-channel construction activities which could affect habitat for Pacific salmonids will be limited to daylight hours during weekdays, leaving a nighttime and weekend period of passage for federally listed fish species.

- Construction BMPs for off-channel staging and storage of equipment and vehicles will be implemented to minimize the risk of contamination of the waters of the stream/river by spilled materials. BMPs will also include minimization of erosion and stormwater runoff, as appropriate.

- Riparian vegetation removed or damaged will be replaced at a ratio, coordinated with NMFS and CDFW, within the immediate area of the disturbance to maintain habitat quality.

- If bank stabilization activities should be necessary, then such stabilization will be constructed to minimize predator habitat, minimize erosion potential, and contain material suitable for supporting riparian vegetation.

- Designated critical habitat within the vicinity of project activities will be identified. All proposed project actions will be designed to avoid direct and indirect adverse modifications to these areas. Minimization measures, such as establishing and maintaining buffers around areas of designated critical habitat will be implemented in the event that avoidance is not feasible.

- If critical habitat may be adversely modified by the implementation of proposed project actions, the area to be modified will be evaluated by a qualified Biologist to determine the potential magnitude of the project effects (e.g., description of primary constituent elements present and quantification of those affected) at a level of detail necessary to satisfy applicable environmental compliance and permitting requirements.

- The project applicant will implement compensatory conservation measures developed through consultation with USFWS or NMFS. If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures a mitigation and monitoring plan will be developed. The plan will include information on responsible parties for long-term management,
holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations. Any impacts that result in a compensation purchase will be required to do so with an endowment for land management in perpetuity prior to any project groundbreaking activities.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure BIO-1c would result in participation in adopted species conservation plans with mitigation consistent with the terms of those plans, or the preparation of project-specific biological resource assessments with avoidance of special-status species where feasible, and where avoidance is not feasible, mitigation consistent with local, state, and federal requirements as described above.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure BIO-1d:** Avoid, minimize, and mitigate impacts to sensitive natural communities.

Measures that shall be implemented, where feasible and necessary to address site-specific impacts, to reduce the impacts to these sensitive natural communities and avoid potential conflicts with local policies that protect them include but are not limited to.

- Projects covered by conservation plans or that are able to utilize take permits under such plans shall abide by the terms of the plan/permit. For all other projects and for non-covered species the following shall apply, dependent on the findings of project-specific biological resources assessment.
- Biological resources assessments for specific projects proposed will be prepared in areas containing, or likely to contain, habitat for sensitive natural communities (see Appendix BIO-3).
- Prior to project initiation, a qualified botanist will conduct surveys for sensitive natural communities in areas where potentially suitable habitat would be removed or disturbed by project activities, these surveys can be carried out concurrent with special-status plant surveys. If no sensitive natural communities are found, the botanist will document the findings in a letter report to CDFW and the implementing agency.
• To the extent practicable, and in consideration of other design requirements and constraints (e.g., meeting primary project objectives and needs, avoidance of other sensitive resources), the implementing agencies will attempt to design the proposed projects in a way that minimizes the removal of native sensitive natural communities, particularly trees that contribute to the overstory canopy of these communities.

• If effects occur to riparian habitat, emergent wetland, or other sensitive natural communities associated with streams or lakes, the implementing agencies will comply with Section 1602 of the California Fish and Game Code; compliance may include measures to protect fish and wildlife resources during the project.

• If riparian vegetation is removed or disturbed, the project applicant will compensate for the loss of riparian vegetation. Compensation will be provided at a sufficient ratio for no net loss of habitat function or acreage for restoration and preservation, and may be a combination of onsite restoration/creation, offsite restoration, preservation, or mitigation credits. At a minimum, the restoration and monitoring plan will include clear goals and objectives, success criteria, specifics on restoration/creation (plant palette, soils, irrigation, etc.), specific monitoring periods and reporting guidelines, and a maintenance plan. Riparian restoration or creation will be monitored for a minimum of five years and will be considered successful when at least 75 percent of all plantings have become successfully established.

• If oak woodland is removed, the county implementing agency will determine if the loss of oak woodland would have a significant impact on the environment. If so, an oak woodland mitigation plan would be developed that achieves a no-net-loss of habitat acreage and function, and may be a combination of restoration/creation, preservation, or mitigation credits. At a minimum, the restoration and monitoring plan will include clear goals and objectives, success criteria, specifics on restoration/creation (e.g., plant palette, soils, irrigation), specific monitoring periods and reporting guidelines, and a maintenance plan. Oak woodland restoration or creation will be monitored for a minimum of five years and will be considered successful when at least 75 percent of all plantings have become successfully established. Such mitigation sites will be dedicated either in fee or as an easement in perpetuity held by a qualified agency. Guaranteed funding for maintenance of the mitigation sites will be established.

• If losses of other sensitive natural communities recognized as sensitive by CDFW (see Appendix BIO-3) would be substantial, then additional compensation will be provided through creating, restoring, or preserving in perpetuity in-kind communities at a sufficient ratio for no-net-loss of habitat function or acreage.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.
Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure BIO-1d would result in participation in adopted species conservation plans with mitigation consistent with the terms of those plans, or the preparation of project-specific biological resource assessments with avoidance of sensitive natural species where feasible, and where avoidance is not feasible, mitigation consistent with local, state, and federal requirements as described above.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure BIO-1e: Avoid, minimize, and mitigate impacts to wetland and other waters.

Measures that shall be implemented, where feasible and necessary to address site-specific impacts, to reduce impacts to wetlands and other waters include but are not limited to:

- Projects covered by conservation plans or that are able to utilize take permits under such plans shall abide by the terms of the plan/permit. For all other projects and for non-covered species the following shall apply, dependent on the findings of project-specific biological resources assessment or wetland delineation.

- Before implementing a proposed project that may affect waters of the United States or waters of the State, the implementing agency will map the distribution of wetlands (including vernal pools and other seasonal wetlands) in the vicinity of the work area.

- The implementing agency will determine, based on the mapped distribution of these wetlands and waters, the acreage of effects, if any, on waters of the United States. If it is determined that wetlands will be affected by the proposed project, the implementing agency will conduct a delineation of waters of the United States, and submit the delineation to USACE for verification. The delineation will be conducted according to methods established in the USACE Wetlands Delineation Manual (Environmental Laboratory, 1987) and Arid West Supplement (Environmental Laboratory, 2008).

- The implementing agencies will obtain a USACE Section 404 permit, RWQCB Section 401 certification, and a Streambed Alteration Agreement (1602) from CDFW if required, and the implementing agency will implement all permit conditions. The acreage, location, and methods for compensation will be determined during the Section 401, Section 404 and Streambed Alteration Agreement (1602) permitting process.
Implementing agencies will adhere to a “no net loss” basis of the acreage of wetlands and other waters of the U.S. and waters of the State that will be removed and/or degraded. Wetland habitat will be restored, enhanced, and/or replaced at an acreage and location and by methods agreeable to USACE, RWQCB, and CDFW as appropriate, depending on agency jurisdiction. The replacement of waters or wetlands will be equivalent to the nature of the habitat lost, and will be provided at a suitable ratio to ensure that, at a minimum, there is no net loss of habitat acreage or value. The replacement habitat will be set aside in perpetuity for habitat use.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure BIO-1e would result in participation in adopted species conservation plans with mitigation consistent with the terms of those plans, or the preparation of project-specific wetlands delineations with avoidance of wetlands where feasible, and where avoidance is not feasible, mitigation consistent with local, state, and federal requirements as described above.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure BIO-2:** Avoid, minimize, and mitigate impacts to wildlife corridors or native wildlife nursery sites.

Measures that shall be implemented at a project-level, where feasible and necessary to address site-specific impacts to wildlife corridors or native wildlife nursery sites include but are not limited to:

- Projects covered by conservation plans or that are able to utilize take permits under such plans shall abide by the terms of the plan/permit. For all other projects and for non-covered species the following shall apply.
- Implementing agencies will design projects such that they avoid and minimize direct and indirect impacts to wildlife corridors and/or native wildlife nursery sites. Design considerations may include but would not be limited to the following:
  - constructing wildlife friendly overpasses, underpasses, bridges and/or culverts that are integrated with appropriate roadside fencing that maintains animals off the road and direct them towards crossing structures;
  - using wildlife friendly fences that allow larger wildlife such as deer to get over, and smaller wildlife to go under;
- Limiting wildland conversions in identified wildlife corridors or native wildlife nursery sites; and
- Retaining wildlife friendly vegetation in and around developments,
- Avoid the nursery season during construction.

For projects that cannot avoid significant impacts to wildlife movement corridors or wildlife nursery areas, implementing agencies will consult with CDFW to determine appropriate measures to minimize direct and indirect impacts that could occur as a result of the proposed project and will implement measures to mitigate impacts to wildlife corridors or native wildlife nursery sites.

For projects that require the placement of stream culverts in a fish spawning stream, the implementing agencies will follow the USACE, NMFS, USFWS and CDFW permit conditions and design requirements to allow fish passage through the culverts.

For projects in or adjacent to riparian corridors, project design will maximize distance of lighting from riparian corridors and direct light sources away from the riparian corridor. Night lighting of trails along riparian corridors should be avoided.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure BIO-2 would result in participation in adopted species conservation plans with mitigation consistent with the terms of those plans, or the avoidance of wildlife corridors or native wildlife nursery sites where feasible, and where avoidance is not feasible, mitigation consistent with local, state, and federal requirements as described above.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure BIO-3:** Avoid, minimize, and mitigate for impacts on protected trees and other biological resources protected by local ordinances.

Measures that shall be implemented, where feasible and necessary to address site-specific impacts, to ensure that the proposed project is consistent with local ordinances protecting trees and other biological resources include but are not limited to:

- Projects covered by conservation plans or that are able to utilize take permits under such plans shall abide by the terms of the plan/permit. For all other projects and for non-covered species the following shall apply.
• A biological resources assessment for specific projects proposed will be prepared in areas containing, or likely to contain, protected trees or other locally protected biological resources (e.g., streams, wetlands, and sensitive natural communities).

• Implementing agencies should design projects such that they avoid and minimize direct and indirect impacts to protected trees and other locally protected resources where feasible, as defined in Section 15364 of the CEQA Guidelines.

• At a minimum, qualifying protected trees (or other resources) will be replaced at ratios included in the local general plan, local policies, city or county codes in locally approved mitigation sites.

• As part of project-level environmental review, implementing agencies will ensure that projects comply with the most recent general plans, policies, and ordinances, and conservation plans. Review of these documents and compliance with their requirements will be demonstrated in project-level environmental documentation.

Review of these documents and compliance with their requirements should be demonstrated in project-level environmental documentation.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure BIO-3 would result in participation in adopted species conservation plans with mitigation consistent with the terms of those plans, or the preparation of project-specific biological resource assessments with avoidance of sensitive natural species where feasible, and where avoidance is not feasible, mitigation consistent with local, state, and federal requirements as described above.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure CR-1: Conduct project-specific historic built environment resource studies and identify and implement project-specific mitigation.

Measures that shall be implemented, where feasible and necessary to address site-specific impacts, include but are not limited to:

• As part of the project/environmental review of individual projects, a records search at the appropriate Information Center of the CHRIS and a review of literature and historic maps shall be conducted to determine whether the project area has been previously surveyed and whether historic built environment resources were identified.
• In the event the records indicate that no previous survey has been conducted within the last five years, a qualified architectural historian (36 Code Fed. Regs., § 61) shall conduct a study of the project area for the presence of historic built environment resources. The study will include conducting a field survey, necessary background, archival and historic research, consultation with local historical societies, museums or other interested parties as relevant, and preparation of a Historic Resource Assessment Report. The report will document the results of the survey and the historic context, evaluate the federal, state, or local significance of built environment resources greater than 45 years in age that may potentially be directly or indirectly impacted by project activities, recommend appropriate protection or mitigative treatment, if any, and include recordation of identified built environment resources on appropriate California Department of Parks and Recreation (DPR) series 523 forms. The final report and DPR forms will be filed by the architectural historian with the CHRIS. Recommended treatment for historical resources identified in the report shall be implemented.

• If no significant historic built environment resources are identified in the Historic Resource Assessment Report or prior survey of the project study area that may be directly or indirectly impacted by project activities, then mitigation for built environment resources is complete, and there is no adverse change to documented historical built environment resources for the project.

• If significant historic built environment resources are identified in the Historic Resource Assessment Report or prior survey of the project study area, the project sponsor and/or implementing agency should consider avoidance as the primary mitigation measure. If avoidance is possible, mitigation to documented historical built environmental resources is complete.

• If avoidance of a significant built environment resource is not feasible, then the maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation, or reconstruction of the historical resource as recommended by a qualified architectural historian or historic architect (36 Code Fed. Regs., § 61) and conducted in a manner consistent with the Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitation, Restoring, and Reconstructing Historic Buildings or Historic Landscapes (Birnbaum and Peters 1996; Weeks and Grimmer 1995) will generally reduce impacts. If adherence to the Secretary of the Interior’s Standards cannot avoid materially altering in an adverse manner the physical characteristics or historic character of the surrounding environmental setting that contribute to a resource’s historical significance, additional mitigation may be required.

• If avoidance of or minimization of substantial adverse effects to a significant built environment resource is not feasible through project design or by adherence to the Secretary of the Interior’s Standards, the project sponsor and/or implementing agency should ensure that Historic American Buildings
Survey (HABS), Historic American Engineering Record (HAER), or Historic American Landscapes Survey (HALS) documentation is completed prior to demolition or significant material alteration of the resource’s physical characteristics or setting. The HABS, HAER, and HALS programs formally document historical resources through the use of large-format photography, measured drawings, written architectural descriptions, and historical narratives. The level of documentation required as mitigation and preparation of the HABS, HAER, or HALS will be determined and prepared by a qualified architectural historian or historic architect (36 Code Fed. Regs., § 61). The documentation packages will be archived in appropriate public and secure repositories. Such documentation would not reduce the impact to a less than significant level.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure CR-1 would result in the preparation of project-specific historic built environment resource inventories consistent with the protocol summarized above including mitigation consistent with local, state, and federal requirements that strives to avoid and minimize impacts.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure CR-2:** Conduct project-specific archaeological resource studies and identify and implement project-specific mitigation.

Measures that shall be implemented, where feasible and necessary to address site-specific impacts, include but are not limited to:

- As part of the appropriate project/environmental review of individual projects, the NAHC shall be consulted to determine whether known sacred sites are in the project area, and to identify Native Americans to contact to obtain information about the project area and relevant areas of cultural sensitivity. Additional consultation with relevant tribal representatives may be appropriate regarding known prehistoric sites, traditional cultural places, TCPs, project areas deemed highly sensitive for prehistoric or ethnohistoric resources, or where avoidance of impacts to prehistoric or ethnohistoric resources may be infeasible. A records search at the appropriate Information Center of the CHRIS shall be conducted by a qualified archaeologist (36 Code Fed. Regs., § 61) as part of the appropriate project/environmental review of individual projects to determine whether the project area has been
previously surveyed and whether archaeological resources were identified.

- In the event the records indicate that no previous survey has been conducted or the survey did not meet current professional standards or regulatory guidelines, the qualified archaeologist (36 Code Fed. Regs., § 61) or the Information Center will make a recommendation on whether a survey is warranted based on the sensitivity of the project area for archaeological resources and current professional standards or regulatory guidelines. If a survey is considered warranted, the archaeological study of the project area by a qualified archaeologist will include conducting a field survey, necessary background research, a Sacred Lands search by the NAHC and consultation with local Native Americans identified by the NAHC, consultation with local historical societies, museums or other interested parties as relevant, and an Archaeological Survey Report. The confidential report will document the results of the survey and the cultural context, assess the federal, state, or local significance of prehistoric, traditional, or historic-era archaeological resources that may potentially be directly or indirectly impacted by project activities, provide appropriate management recommendations, and include recordation of identified archaeological resources on appropriate California DPR series 523 forms. Management recommendations may include but not be limited to additional studies to evaluate identified sites, treatment for documented historical resources, or archaeological monitoring during ground-disturbing construction activities at locations determined by the archaeologist to be sensitive for subsurface cultural resource deposits, including local Native American monitors if sensitive for prehistoric resources. The final confidential report and DPR forms would be filed by the archaeologist with the CHRIS. Recommended treatment for historical resources identified in the report should be implemented.

- If no archeological resources are identified in the Archeological Survey Report that may be directly or indirectly impacted by project activities, mitigation is complete as there would be no adverse change to documented archeological resources.

- When a project will impact a known archaeological site, the project sponsor and/or implementing agency shall determine whether the site is a historical resource (CEQA Guidelines § 15064.5 (c)(1)). If archaeological resources identified in the project area are considered potentially significant, the project sponsor and/or responsible implementing agency shall undertake additional studies overseen by a qualified archaeologist (36 Code Fed. Regs., § 61) to evaluate the resources eligibility for listing in the CRHR, NRHP, or local register and to recommend further mitigative treatment. Evaluations shall be based on, but not limited to, surface remains, subsurface testing, or archival and ethnographic resources, on the framework of the historic context and important research questions of the project area, and on the integrity of the resource. If a site to be tested is prehistoric, local tribal representatives should be afforded the opportunity to
monitor the ground-disturbing activities. Appropriate mitigation may include curation of artifacts removed during subsurface testing.

- If significant archaeological resources that meet the definition of historical or unique archaeological resources are identified in the project area, the preferred mitigation of impacts is preservation in place (CEQA Guidelines § 15126.4(b); Pub. Resources Code, § 21083.2). Preservation in place may be accomplished by, but is not limited to, avoidance by project design, incorporation within parks, open space or conservation easements, covering with a layer of sterile soil, or similar measures. If preservation in place is feasible, mitigation is complete. Additionally, where the implementing agency determines that an alternative mitigation method is superior to in-place preservation, the project sponsor and/or implementing agency may implement such alternative measures.

- When preservation in place or avoidance of historical or unique archaeological resources are infeasible, data recovery through excavation shall be required (CEQA Guidelines § 15126.4(b)). Data recovery would consist of approval of a Data Recovery Plan and archaeological excavation of an adequate sample of site contents so that research questions applicable to the site can be addressed. For prehistoric sites, local tribal representatives should be afforded the opportunity to monitor the ground-disturbing activities. If only part of a site will be impacted by a project, data recovery will only be necessary for that portion of the site. Data recovery will not be required if the implementing agency determines prior testing and studies have adequately recovered the scientifically consequential information from the resources. Studies and reports resulting from the data recovery shall be deposited with the appropriate CHRIS Information Center. Archaeological sites known to contain human remains shall be treated in accordance with the provisions of Section 7050.5 Health and Safety Code or the provisions of NAGPRA on federal lands. Mitigation may include curation for artifacts removed during data recovery excavation.

- If archaeological resources are discovered during construction, all work near the find shall be halted and the project sponsor and/or implementing agency shall follow the steps described under CEQA Guidelines Section 15064.5(f), including an immediate evaluation of the find by a qualified archaeologist (36 Code Fed. Regs., § 61) and implementation of avoidance measures or appropriate mitigation if the find is determined to be a historical resource or unique archaeological resource. Consultation with or affording local tribal representatives the opportunity to monitor mitigative treatment may be appropriate. Should the find include human remains, the remains shall be treated in accordance with the provisions of Section 7050.5 of the Health and Safety Code or the provisions of NAGPRA on federal lands. During evaluation or mitigative treatment, ground disturbance and construction work could continue on other parts of the project area.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.
Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure CR-2 would result in the preparation of project-specific archeological resource inventories consistent with the protocol summarized above, including mitigation consistent with local, state, and federal requirements that strives to avoid and minimize impacts. Implementation of this measure would also ensure that unknown subsurface resources are properly protected and assessed if discovered.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure CR-3: Reduce visibility or accessibility of historical or unique archaeological resources.

The project sponsor and/or implementing agency shall determine whether or not implementation of a project will indirectly impact historical or unique archaeological resources by increasing public visibility and ease of access. Increased visibility and accessibility may place a significant archaeological site in danger of disturbance, alteration, or destruction via vandalism, unauthorized collection of artifacts, or destruction (intentional or unintentional) of prehistoric or historic features. If so, the project sponsor and/or implementing agency shall take measures to reduce the visibility or accessibility of the historical or unique archaeological resource to the public. Visibility of the resource can be reduced through the use of decorative walls or vegetation screening. Accessibility can be reduced by installing fencing or vegetation barriers, particularly noxious vegetation, such as poison oak or blackberry bushes. It is important to avoid creating an attractive nuisance when protecting significant archaeological sites. Conspicuous walls or signs indicating that an area is restricted may result in more attempts to access the excluded area.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure CR-3 would ensure that historical or unique archeological resources that may be indirectly at risk due to increased public visibility and ease of access are protected through the use of walls or vegetation screening to reduce visibility and installation of fencing or vegetation barriers to reduce accessibility.
Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure CR-4: Conduct project-specific paleontological resource studies and identify and implement mitigation.

Measures that shall be implemented, where feasible and necessary to address site-specific impacts, include but are not limited to:

- The fossil yielding potential of the project area shall be determined by initially identifying the aerial and stratigraphic extents of the local geology, and then by performing a site-specific search of fossil locality records and peer-reviewed literature, as appropriate, by a qualified professional paleontologist, established state clearinghouse such as the UCMP, and/or by an established paleontological repository. A field survey by a qualified professional paleontologist to assess the paleontological sensitivity of the project area may be warranted if the preliminary review is inconclusive.

- If a project is found to contain or be in the near vicinity of previously identified paleo-resources, to be located within an area of high, moderate, or undetermined paleontological resource sensitivity, or to be near a known unique geological feature, the project sponsor and/or implementing agency shall retain a qualified professional paleontologist prior to construction to conduct a survey, as warranted, to locate surface fossil concentrations and to assess the sensitivity of the project area for unique paleontological resources or geologic features. After completion of the survey, the qualified paleontologist will complete a technical report documenting the results of all work, and include any recommended mitigation recommendations specific to the project. This study shall comply with standards in the industry such as the Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontological Resources (SVP, 2010) and applicable regulations.

- If the study indicates the project area is located in an area rich with paleontological resources or geologic features, the study may recommend that the project sponsor and/or implementing agency retain a qualified paleontologist to prepare a Paleontology Mitigation Plan and monitor subsurface disturbance, such as grading, excavation, and trenching. Construction protocols to ensure that contractors take appropriate measures to avoid destroying fossil materials discovered during construction shall also be established by the project sponsor and/or implementing agency.

- Any area of known unique paleontological resources within a project area shall be avoided during construction if feasible. If avoidance of known resources is infeasible or a project has been identified as potentially directly or indirectly impacting, damaging or destroying a unique paleontological resource, treatment measures for nonrenewable unique paleontological resources or unique geologic features may include appropriate
documentation and/or salvage measures for fossils, microfossils, or matrix in consultation with the project sponsor and/or implementing agency. Treatment shall comply with regulatory requirements. Measures may include plans for sampling and data recovery. All final documentation of mitigation treatment for paleontological resources to be impacted by the project shall be approved by the project sponsor and/or implementing agency prior to the initiation of any project ground-disturbing activities.

- If fossils or other paleontological resources are encountered during construction, all work shall be halted within a minimum 30-foot radius of the find and a qualified paleontologist shall be contacted to examine the find and evaluate its significance. If the find is deemed to have significant scientific value, the paleontologist and the project sponsor and/or implementing agency shall coordinate with the property owner to formulate a plan to either avoid impacts, document the resource, or to continue construction without disturbing the integrity of the find (e.g., by excavating the material containing the resources). Consistent with regulatory requirements, recommendations determined by the qualified professional paleontologist, project sponsor, and/or implementing agency to be necessary and feasible shall be implemented before construction activities can resume at the site where the paleontological resources were discovered.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure CR-4 would result in the preparation of project-specific paleontological resource inventories consistent with industry protocol summarized above that encourages avoidance and minimization of impacts. Implementation of this measure would also ensure that unknown subsurface resources are properly protected and assessed if discovered.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure CR-5:** Conduct project-specific consultation with traditionally and culturally affiliated California Native American tribes to identify tribal cultural resources (TCR) and implement project-specific mitigation.

If the implementing agency determines that a project may cause a substantial adverse change to a TCR, and measures are not otherwise identified in the consultation process under Public Resources Code Section 21080.3.2, the following mitigation measures described at Public Resources Code Section 21084.3 shall be implemented, where feasible
and necessary, to address site-specific impacts in order to avoid or minimize the significant adverse impacts:

- Avoidance and preservation of the TCRs in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria;
- Treating the TCR with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to: protecting the cultural character and integrity of the resource; or protecting the traditional use of the resource; protecting the confidentiality of the resource;
- 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; or
- Protecting the resource.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure CR-5 would result in tribal consultation, and mitigation including resource avoidance, dignified resource treatment, and/or resource protection consistent with local, state, and federal requirements.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure CR-6:** Reduce visibility or accessibility of tribal cultural resources. Measures that shall be implemented for projects that have a NOP, ND, or MND filed on or after July 1, 2015 include:

- The project sponsor and/or implementing agency shall determine whether or not implementation of a project will indirectly impact TCRs by increasing public visibility and ease of access. Increased visibility and accessibility may place a TCR in danger of disturbance, alteration, or destruction via vandalism, unauthorized collection of artifacts, or destruction (intentional or unintentional) of features, traditional resources, or traditional use of a TCR. If so, the project sponsor and/or implementing agency shall take measures to reduce the visibility or accessibility of the TCR to the public. Visibility of
the resource can be reduced through the use of decorative walls or vegetation screening. Accessibility can be reduced by installing fencing or vegetation barriers, particularly noxious vegetation such as poison oak or blackberry bushes. It is important to avoid creating an attractive nuisance when protecting TCRs. Conspicuous walls or signs indicating that an area is restricted may result in more attempts to access the excluded area.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure CR-6 would ensure that TCRs that may be indirectly at risk due to increased public visibility and ease of access are protected through the use of walls or vegetation screening to reduce visibility and installation of fencing or vegetation barriers to reduce accessibility.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure ENE-1:** Require new development to provide necessary infrastructure to charge electric vehicles.

To address this impact, where feasible and necessary to address site-specific impacts, the lead agency shall (1.) require all new single-family residential developments to install conduit necessary for the installation of charging infrastructure for electric vehicles for the use and charging of electric vehicles at the place of residence; and, (2.) require all new multi-family residential developments to install both necessary conduit and charging equipment for electric vehicles. All charging infrastructure and equipment shall be sufficient to meet or exceed electric vehicle supply equipment (EVSE) installation requirements of CALGreen Tier 1.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure ENE-1 would ensure that new development provides necessary infrastructure for charging electric vehicles.
vehicles, including conduits and charging equipment, sufficient to meet or exceed CALGreen Tier 1 requirements.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure ENE-2:** Require new development to comply with local GHG reduction plans that contain measures identified in the Scoping Plan.

The implementing agency should require development and transportation projects to comply with locally-adopted GHG reduction plans that, at a minimum, specifically address measures in the Scoping Plan aimed at reducing GHG emissions. Local plans should include local targets to help the state achieve the AB 32 goal of reducing 5 MMT CO\(_2\)e from cities and counties, which also will result in reduced reliance on oil and natural gas from residential, commercial, industrial, and public land uses, as well as transportation.

If a local GHG reduction plan does not exist, the jurisdiction should adopt a plan with the foregoing features and apply such plan to new development projects.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure ENE-2 would require development to be consistent with local GHG reduction plans and that these plans should contain local targets for achieving AB 32 goals. If a local GHG reduction plan does not exist then the jurisdiction is encouraged to adopt one.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure GEO-1:** Reduce soil erosion and loss of topsoil through erosion control mitigation and SWPPP.

The implementing agency shall require the development and implementation of detailed erosion control measures, consistent with the CBC and UBC regulations and guidelines and/or local NPDES, to address erosion control specific to the project site; revegetate sites to minimize soil loss and prevent significant soil erosion; avoid construction on unstable slopes and other areas subject to soil erosion where possible; require management techniques that minimize soil loss and erosion; manage grading to maximize the capture and retention of water runoff through ditches, trenches, siltation ponds, or similar measures; and minimize erosion through adopted protocols and standards in the industry. The implementing agency should also require land use and transportation projects to comply with locally adopted grading, erosion, and/or sediment control ordinances beginning when
any preconstruction or construction-related grading or soil storage first occurs, until all final improvements are completed.

If a local grading, erosion, and/or sediment control ordinance or other applicable plans or regulations do not exist, the jurisdiction should adopt ordinances substantially addressing the foregoing features and apply those ordinances to new development projects.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure GEO-1 would require the development of project-specific erosion control measures, revegetation of the site to minimize soil loss and prevent significant soil erosion, avoidance of construction on unstable or erosive slopes, site management to minimize soil loss and prevent erosion, grading to capture and retain water runoff on site, and other measures to minimize erosion. Implementation of this measure would ensure compliance with local grading, erosion, and sediment control ordinances and encourages the development of such ordinances if they do not exist.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure GEO-2:** Implement Mitigation Measure GEO-1.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure GEO-2 would require the development of project-specific erosion control measures, revegetation of the site to minimize soil loss and prevent significant soil erosion, avoidance of construction on unstable or erosive slopes, site management to minimize soil loss and prevent erosion, grading to capture and retain water runoff on site, and other measures to minimize erosion. Implementation of this measure would ensure compliance with local grading, erosion, and sediment control ordinances and encourages the development of such ordinances if they do not exist.
Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure GEO-3: Reduce the loss of availability of a designated mineral resource.

The implementing agency shall protect against the loss of availability of a designated mineral resource through identification of locations with designated mineral resources and adoption and implementation of policies to conserve land that is most suitable for mineral resource extraction from development of incompatible uses.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure GEO-3 would result in identification of mineral resources designated by the state as having regional or statewide significance, and protection of that land from development of incompatible uses.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure HAZ-1: Reduce the impacts to the public and the environment from the reasonably foreseeable upset and accident conditions involving the release of hazardous materials by requiring implementation of best practice safety standards regarding crude oil transport.

SACOG, in commenting on several specific projects and on federal rulemaking, has identified numerous measures to mitigate the impacts of crude oil shipments by rail. These include, but are not limited to, the following:

- Removal of the most volatile elements, including flammable natural gas liquids, prior to shipment.
- More stringent tank car safety standards.
- Improved rail transportation route analysis, and modification of routes based on that analysis.
- Utilization of the best available inspection equipment and protocols, and implementation of positive train control.
- Reduced train car speeds to 40 miles per hour when passing through urbanized areas of any size.
- Limitations on storage of crude oil tank cars in urbanized areas of any size and provide appropriate security in storage yards for all shipments.
- Advance notification to county and city emergency operations offices of all crude oil shipments, including a contact number that can provide real-time information in the event of an oil train derailment or accident.
- Quarterly hazardous commodity flow information, including classification and characterization of materials being transported, to all first response agencies (49 Code Fed. Regs. 15.5) along the mainline rail routes used by trains carrying crude oil identified.
- Funding for training and outfitting emergency response crews that includes the cost of backfilling personnel while in training.
- Annual emergency responses scenario/field based training including Emergency Operations Center Training activations with local emergency response agencies.

**Timing/Milestone:** This mitigation measure is within the jurisdiction of state and federal regulatory agencies, railroad carriers, and local agencies approving crude oil by rail projects.

**Responsibility for Oversight:** See Timing/Milestone.

**Implementation of Mitigation Measure:** See Timing/Milestone.

**Responsibility for Implementation:** See Timing/Milestone.

**Mitigation Measure HAZ-2:** Determine if project sites are included on a government list of hazardous materials sites pursuant to Government Code Section 65962.5.

For any listed sites or sites that have the potential for residual hazardous materials as a result of historic land uses, project proponents shall prepare a Phase I ESA that meets ASTM standards. For any sites that are not listed and do not have the potential for residual hazardous materials as a result of historic land uses, no action is required unless unknown hazards are discovered during development. In that case, the implementing agency shall discontinue development until DTSC, RWQCB, local air district, and/or other responsible agency issues a determination, which would likely require a Phase 1 ESA as part of the assessment. Projects preparing a Phase I ESA, where required, shall fully implement the recommendations contained in the report. If a Phase I ESA indicates the presence or likely presence of contamination, the project proponent shall require a Phase II ESA, and recommendations of the Phase II ESA shall be fully implemented.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA
Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure HAZ-2 would result in the preparation of a Phase I Environmental Site Assessment (ESA) that meets industry standards for project sites that appear on government lists of hazardous materials sites pursuant to Government Code Section 65962.5 and for project sites that have the potential to contain residual hazardous materials and/or waste as a result of location and/or prior uses or are found to contain unknown hazards. As a part of this mitigation, the recommendations of the Phase I ESA are to be implemented including preparation, if appropriate, of a Phase II ESA, and implementation of recommendations contained in that report.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure HAZ-3: Implement state and local requirements for ongoing emergency evacuation planning.

Implementing agencies shall require implementation of state and local requirements regarding evacuation planning and application of recommended applicable mitigation measures as defined by state and local agencies. Examples of mitigation measures should include, but are not limited to, the following:

- Continue to coordinate locally and regionally based on ongoing review and integration of projected transportation and circulation conditions;
- Develop new methods of conveying projected and real time information to citizens using emerging electronic communication tools including social media and cellular networks; and
- Continue to evaluate lifeline routes for movement of emergency supplies and evacuation.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure HAZ-3 would ensure that state and local requirements regarding evacuation planning and application of applicable mitigation measures are implemented, as well as ensure local and regional coordination regarding transportation and circulation, development of new methods of conveying real time emergency information, and continued evaluation of lifeline evacuation routes.
Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure HYD-1: Manage stormwater runoff and other surface drainage.

Measures that shall be implemented at a project-level, where feasible and necessary to address site-specific impacts, to reduce the impacts to hydrological resources, include but are not limited to:

- The implementing agency should require projects to direct stormwater run-off and other surface drainage into an adequate on-site system or into a municipal system with capacity to accept the project drainage. This should be demonstrated by requiring consistency with local stormwater drainage master plans or a project-specific drainage analysis satisfactory to the jurisdiction’s engineer of record.
- The implementing agency should develop and implement best management practices (BMPs) for control of stormwater associated with rural residential development not otherwise subject to other runoff and water quality control requirements.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure HYD-1 would ensure that projects direct stormwater run-off and other surface drainage into an adequate on-site system or into a municipal system with capacity to accept the project drainage, demonstrated by requiring consistency with local stormwater drainage master plans or a project-specific drainage analysis satisfactory to the jurisdiction’s engineer of record and that best management practices (BMPs) for control of stormwater associated with rural residential development not otherwise subject to other runoff and water quality control requirements are implemented.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure HYD-2: Use best management practices to treat water quality.

The implementing agency should require the use of BMPs or equivalent measures to treat water quality on-site, prior to leaving the project site, and/or at the municipal system as necessary to achieve local or other applicable standards. This should be demonstrated by requiring consistency with local standards and practices for water quality control and management of erosion and sedimentation, and/or other applicable standards, including
the CBC and UBC regulations and guidelines and/or local NPDES. Implementation of Mitigation Measure GEO-1 will also help mitigate this impact.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure HYD-2 ensures the use of BMPs or equivalent measures to treat water quality at on-site basins, prior to leaving the project site, and/or at the municipal system as necessary to achieve local or other applicable standards, demonstrated by requiring consistency with local standards and practices for water quality control and management of erosion and sedimentation, and/or other applicable standards, including the CBC and UBC regulations and guidelines and/or local NPDES.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure HYD-3:** Implement Mitigation Measure GEO-1 (Reduce soil erosion and loss of topsoil through erosion control mitigation and SWPPP).

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure HYD-3 would require the development of project-specific erosion control measures, revegetation of the site to minimize soil loss and prevent significant soil erosion, avoidance of construction on unstable or erosive slopes, site management to minimize soil loss and prevent erosion, grading to capture and retain water runoff on site, and other measures to minimize erosion. Implementation of this measure would ensure compliance with local grading, erosion, and sediment control ordinances and encourages the development of such ordinances if they do not exist.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.
Mitigation Measure HYD-4: Conduct hydrology studies for projects in floodplains.

The implementing agency should conduct or require project-specific hydrology studies for projects proposed to be constructed within floodplains to demonstrate compliance with applicable federal, state, and local agency flood-control regulations. These studies should identify project design features or measures that reduce impacts to either floodplains or flood flows to a less than significant level.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure HYD-4 would ensure that project-specific hydrology studies are prepared for projects proposed to be constructed within floodplains to demonstrate compliance with applicable federal, state, and local agency flood-control regulations. These studies would identify project design features or mitigation measures that reduce impacts to either floodplains or flood flows to levels consistent with federal, state, and local regulations and laws related to development in the floodplain.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

Mitigation Measure HYD-5: Implement Mitigation Measure PS-1.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure HYD-5 would ensure adequate public services and utilities will be available to satisfy levels identified in local general plans or relevant service master plans.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

Mitigation Measure HYD-6: In areas of existing or potential future land subsidence due to groundwater pumping, establish cooperative regional relationships to define and manage sustainable yield.
Implementing agencies shall establish cooperative, comprehensive regional relationships with appropriate water supply planning agencies to define and manage the groundwater sustainable yield in areas of existing or potentially unsustainable groundwater use. At a minimum this effort should involve the following:

1. Determine how growth and development will document compliance with current regulations related to sustainable groundwater use;
2. Establish cooperative agreements within groundwater basins to study and define sustainable yield, undertake regular monitoring, and reach agreement regarding management of groundwater withdrawal pursuant to sustainable yield objectives;
3. Develop and implement recharge programs in areas where land subsidence is, or is likely to become, a problem;
4. Cooperate regionally to consider use of surface water resources; and
5. Ensure that new land uses do not exacerbate the potential for groundwater overpumping and land subsidence, and strive to avoid increases in subsidence.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure HYD-6 would ensure that compliance with current regulations related to sustainable groundwater use is documented, cooperative regional relationships are established within groundwater basins to define and manage sustainable yield in areas where subsidence is or may be a problem, recharge programs are developed and implemented, cooperative use of surface water resources is considered, and new land uses do not exacerbate groundwater overpumping and subsidence, among other things.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure HYD-7: Implement Mitigation Measure HYD-2.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.
Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure HYD-7 ensures the use of BMPs or equivalent measures to treat water quality at on-site basins, prior to leaving the project site, and/or at the municipal system as necessary to achieve local or other applicable standards, demonstrated by requiring consistency with local standards and practices for water quality control and management of erosion and sedimentation, and/or other applicable standards, including the CBC and UBC regulations and guidelines and/or local NPDES.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure HYD-8: Implement Mitigation Measure HYD-2.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure HYD-8 ensures the use of BMPs or equivalent measures to treat water quality at on-site basins, prior to leaving the project site, and/or at the municipal system as necessary to achieve local or other applicable standards, demonstrated by requiring consistency with local standards and practices for water quality control and management of erosion and sedimentation, and/or other applicable standards, including the CBC and UBC regulations and guidelines and/or local NPDES.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure NOI-1: Employ measures to reduce noise from new land uses and transportation projects.

For projects that have not undergone previous noise study and that exceed acceptable noise thresholds, the implementing agency should conduct a project-level evaluation of noise impacts in accordance with applicable federal, state, and local noise standards. Where significant impacts are identified, applicable mitigation measures shall be implemented, to reduce noise to be in compliance with applicable noise standards. Measurements that shall be implemented, where feasible and necessary to address site-specific impacts, include but are not limited to:

- constructing barriers in the form of sound walls, buildings, or earth berms to attenuate noise at adjacent residences;
• using land use planning measures, such as zoning, restrictions on development, site design, and buffers to ensure that future development is compatible with adjacent transportation facilities and land uses;
• constructing roadways so that they are depressed below-grade of the existing sensitive land uses to create an effective barrier between new roadway lanes, roadways, rail lines, transit centers, park-n-ride lots, and other new noise generating facilities;
• maximizing the distance between noise-sensitive land uses and new noise-generating facilities and transportation systems;
• improving the acoustical insulation of dwelling units where setbacks and sound barriers do not sufficiently reduce noise; and
• using rubberized asphalt or “quiet pavement” to reduce road noise for new roadway segments, roadways in which widening or other modifications require re-pavement, or normal reconstruction of roadways where re-pavement is planned.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure NOI-1 would result in a project-level evaluation of noise impacts in accordance with applicable standards and implementation of measures identified above, among other things.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure NOI-2: Employ vibration-reducing measures on new and expanded rail systems.

The implementing agency shall require project proponents to undertake a detailed evaluation of vibration and groundborne noise impacts and identify project-specific mitigation measures, as necessary to reduce vibration to a level that is in compliance with applicable local standards or FTA standards. Measures that shall be implemented, where feasible and necessary to address site-specific conditions in order to minimize the effects of vibration and groundborne noise from rail operations include but are not limited to:

• complying with all applicable local vibration and groundborne noise standards, or in the absence of such local standards, comply with FTA vibration and groundborne noise standards.
• maximizing the distance between tracks and sensitive uses;
• conducting rail grinding on a regular basis to keep tracks smooth;
• conducting wheel truing to re-contour wheels to provide a smooth running surface and removing wheel flats;
• providing special track support systems such as floating slabs, resiliently supported ties, high-resilience fasteners, and ballast mats; and
• implementing operational changes such as limiting train speed and reducing nighttime operations.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure NOI-2 would result in a project-level evaluation of noise impacts in accordance with applicable standards and implementation of measures identified above, among other things.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure NOI-3: Reduce noise, vibration, and groundborne noise generated by construction activities.

Measures that shall be implemented to reduce noise, vibration, and groundborne noise generated by construction activities, where feasible and necessary to address site-specific considerations, include but are not limited to:

• restrict construction activities to permitted hours in accordance with local jurisdiction regulations;
• properly maintain construction equipment and outfit construction equipment with the best available noise suppression devices (e.g., mufflers, silencers, wraps);
• prohibit idling of construction equipment for extended periods of time in the vicinity of sensitive receptors;
• locate stationary equipment such as generators, compressors, rock crushers, and cement mixers as far from sensitive receptors as possible; and
• predrill pile holes to the maximum feasible depth, provided that pile driving is necessary for construction.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.
Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure NOI-3 would result in limited hours of construction, properly maintained equipment with available noise suppression devices, controls on vehicle idling near sensitive receptors, location of stationary equipment such as generators, compressors, rock crushers, and cement mixers away from sensitive receptors, and pre-drilling of piles holes to the maximum feasible depth, among other things.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure PS-1: Ensure adequate public services and utilities will be available to satisfy applicable service levels.

The implementing agency shall ensure that public services and utilities will be available to meet or satisfy applicable service levels. This shall be documented in the form of a capacity analysis or provider will-serve letter.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure PS-1 would ensure adequate public services and utilities will be available to satisfy applicable service levels.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure PS-2: Implement the construction-related mitigation measures identified in other chapters of the MTP/SCS EIR.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.
Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure PS-2 would ensure that construction of public service facilities is consistent with applicable federal, state, and local laws and regulations.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure TRN-1: Strategies to support the movement of agricultural products on rural roadways near growth areas.

Implementing agencies shall require implementation of best practice goods movement standards regarding agricultural products transport and apply recommended applicable mitigation measures as defined by state and federal agencies for new growth in Developing Communities or Rural Residential Communities. Examples of mitigation measures should include, but are not limited to, the following:

To reduce the impacts to the movement of agricultural products on rural roadways related to land use and transportation changes from the implementation of the proposed MTP/SCS, one or more of the following measures shall be implemented by local agencies for new growth in Developing Communities or Rural Residential Communities.

- Consider access needs for agricultural uses in the site design and phasing of development adjacent to rural roads. Balancing the needs from increased passenger vehicle travel in Developing Communities with the preservation of key access points for trucks and agricultural equipment can increase safe and efficient agricultural operations.

- Prioritize safety and design improvements along rural roadways that are important farm-to-market routes and projected to accommodate future traffic increases from growth in Developing Communities and Rural Residential areas. Focusing available local funding on improvements to make these roadways consistent with local design standards (such as horizontal curvature, site distance, etc.) improves safety and reduces friction between agricultural operations, trucks, and passenger vehicles on the corridors with the greatest need.
  - Reduce the growth in passenger vehicle miles traveled (VMT) in Developing Communities and Rural Residential areas through increased local investments in transit and non-motorized improvements. Implementing transportation demand management strategies identified in Mitigation Measure TRN 2 that divert some single occupancy auto trips to alternative modes reduces friction with travel for agricultural operations along rural roadways.

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be
reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure TRN-1 would result in the implementation of best practice goods movement standards for transport of agricultural products including implementation of the measures listed above in developing and rural residential communities.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure TRN-2: Apply best practice strategies to reduce the localized impact from construction activities on the transportation system.

Implementing agencies shall require implementation of best practice strategies regarding construction activities on the transportation system impacts and apply recommended applicable mitigation measures as defined by state and federal agencies. Examples of mitigation measures should include, but are not limited to, the following:

- Apply special construction techniques to minimize impacts to traffic flow and provide adequate access to important destinations in the area.
- Develop circulation and detour plans to minimize impacts to local street impacts from construction activity on nearby major arterials. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone.
- Establish truck “usage” routes that minimize truck traffic on local roadways to the extent possible.
- Schedule truck trips outside of peak morning and evening commute hours.
- Route truck trips to avoid roadway segments with at risk or failed pavement conditions.
- Limit the number of lane closures during peak hours to the extent possible.
- Identify detours for bicycles and pedestrians in all areas potentially affected by project construction and provide adequate signage to mark these routes.
- Install traffic control devices as specified in the California Department of Transportation Manual of Traffic Controls for Construction and Maintenance Work Zones.
- Develop and implement access plans for potentially impacted local services such as police and fire stations, transit stations, hospitals, schools and parks. The access plans should be developed with the facility owner or administrator. To minimize disruption of emergency vehicle access, affected jurisdictions should be asked to identify detours for emergency vehicles, which will then be posted by the contractor.
• Store construction materials only in designated areas that minimize impacts to nearby roadways.

• Coordinate with local transit agencies for temporary relocation of routes or bus stops in works zones, as necessary.

• Conduct a public information campaign about how to use transit and other methods to reduce single-occupant vehicle use.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure TRN-2 would result in the implementation of best practice strategies including implementation of the measures listed above:

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure USS-1:** Implement Mitigation Measure PS-1.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure USS-1 would ensure adequate public services and utilities will be available to satisfy applicable service levels.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure USS-2:** Implement Mitigation Measure PS-1.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable

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Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure USS-2 would ensure adequate public services and utilities will be available to satisfy applicable service levels.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure USS-3:** Perform project-level CEQA environmental review for new wastewater treatment plants, landfills, and similar large utility facilities.

The implementing agency shall undertake project-level review, where feasible and as necessary to address site-specific impacts, in order to provide CEQA clearance for new wastewater treatment plants, landfills, and similar large utility facilities.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure USS-3 would ensure project-level CEQA environmental review for new wastewater treatment plants, landfills, and similar large utility facilities.

**Responsibility for Implementation:** Implementing/lead agency and/or developer.

**Mitigation Measure USS-4:** Implement the construction-related mitigation measures identified in other chapters of the MTP/SCS EIR.

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** If found to be feasible by the implementing/lead agency, implementation of Mitigation Measure USS-4 would result in the implementation of other construction-related mitigation measures in other chapters of the MTP/SCS EIR.
Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure CUM-1: Implement Mitigation Measures in Chapter 3 (Aesthetics).

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.


Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure CUM-2: Implement Mitigation Measures in Chapter 4 (Agriculture and Forestry Resources).

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: See discussion of implementation of Mitigation Measures AG-1 through AG-8.

Responsibility for Implementation: Implementing/lead agency and/or developer.

Mitigation Measure CUM-3: Implement Mitigation Measures in Chapter 5 (Air Quality).

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: See discussion of implementation of Mitigation Measures AIR-1 through AIR-4.

Responsibility for Implementation: Implementing/lead agency and developer.
Mitigation Measure CUM-4: Implement Mitigation Measures in Chapter 6 (Biological Resources).

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** See discussion of implementation of Mitigation Measures BIO-1 through BIO-3.

**Responsibility for Implementation:** Implementing/lead agency and developer.

Mitigation Measure CUM-5: Implement Mitigation Measures in Chapter 7 (Cultural and Paleontological Resources).

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** See discussion of implementation of Mitigation Measures CR-1 through CR-6.

**Responsibility for Implementation:** Implementing/lead agency and developer.

Mitigation Measure CUM-10: Implement Mitigation Measures in Chapter 11 (Hydrology and Water Quality).

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** See discussion of implementation of Mitigation Measures HYD-1 through HYD-8.

**Responsibility for Implementation:** Implementing/lead agency and developer.
Mitigation Measure CUM-12: Implement Mitigation Measures in Chapter 13 (Noise).

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: See discussion of implementation of Mitigation Measures NOI-1 through NOI-3.

Responsibility for Implementation: Implementing/lead agency and developer.

Mitigation Measure CUM-14: Implement Mitigation Measures in Chapter 15 (Public Services and Recreation).

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: See discussion of implementation of Mitigation Measures PS-1 and PS-2.

Responsibility for Implementation: Implementing/lead agency and developer.

Mitigation Measure CUM-16: Implement Mitigation Measures in Chapter 17 (Utilities and Service Systems).

Timing/Milestone: This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

Responsibility for Oversight: Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

Implementation of Mitigation Measure: See discussion of implementation of Mitigation Measures USS-1 through USS-4.

Responsibility for Implementation: Implementing/lead agency and developer.
**Mitigation Measure CUM- 19:** Implement Mitigation Measures in Chapter 17 (Utilities and Service Systems, Solid Waste).

**Timing/Milestone:** This mitigation measure will be considered by the implementing/lead agency for applicability at the project level.

**Responsibility for Oversight:** Implementing/lead agency. Compliance will be reflected in subsequent CEQA compliance documents, including Sustainable Communities Environmental Assessments (SCEAs) or other tiered CEQA documents prepared for projects in the MTP/SCS.

**Implementation of Mitigation Measure:** See discussion of implementation of Mitigation Measures USS-3 and USS-4.

**Responsibility for Implementation:** Implementing/lead agency and developer.
June 13, 2018
City of Davis
Planning Commission
PlanningCommission@cityofdavis.org

Via email

Re: Comments on items 5B (Reconsideration of Davis Live) and 5D (Potential Ordinance Regarding Administrative Approvals) for the June 13, 2018 Planning Commission Meeting.

Dear Chair Hofmann and Commissioners:

I submit the following comments for your consideration of items 5B and 5D. Members of the Old East Davis Neighborhood Association met on June 11, 2018, in part to discuss proposed Planning Commission actions on these items. These comments reflect and incorporate neighborhood discussion, though the wording and ultimately the opinions are my own.

Item 5B. The Planning Commission should decline to reconsider Davis Live as a Sustainable Communities Project. Staff asks that the Planning Commission suspend Rosenberg’s Rules of Order, to allow a “do-over” of the Commission’s May 23, 2018 deliberations and subsequent decisions regarding the Project. At the May 23 hearing, the Commission found that the Project is not statutorily exempt from CEQA review as a Sustainable Communities Project, and further declined to recommend Project approval. These decisions were correct and appropriate.

The exemption of Davis Live from CEQA review as a Sustainable Communities Project would be a significant planning decision having broad consequences. Yet the argument for exemption does not survive even modest scrutiny. To qualify for exemption, the Project must meet all requirements for a Transit Priority Project (PRC 21155), as well as additional requirements for designation as a Sustainable Communities Project, detailed in PRC 21155.1. In particular, PRC 21155.1(c)(1)(A) states the following requirements for the provision of affordable housing, claimed by city staff to be satisfied by the Davis Live project:

At least 20 percent of the housing will be sold to families of moderate income, or not less than 10 percent of the housing will be rented to families of low income, or not less than 5 percent of the housing is rented to families of very low income.

The word families is used for each level of affordability, and a plain reading of the law’s text indicates its intent to provide housing for families. Yet the Davis Live proposal is for student housing, rented by the bed. Staff’s interpretation of the affordable housing requirements of
PRC 21155.1 is certainly creative, and arguably inappropriate, in suggesting that dormitory-like student housing be granted a CEQA exemption intended for family housing.

A seven-story building providing bed-rental student housing would be exempted from CEQA review under planning staff’s current approach. This is an obvious over-reach, in my view. The Planning Commission should decline to reconsider Davis Live as a Sustainable Communities Project. City staff should withdraw the current planning documents and re-submit the proposal, using an appropriate standard of review for a project of this type.

Item 5D. The Planning Commission should advise against an expansion of the types of uses approvable through an administrative process.

Speaking for myself, there is little trust in planning staff decision-making regarding building and development. Public noticing, hearings, and the incorporation of community input are, even now, inadequate to balance the competing interests of the city and its residents. Expanding the scope of administrative review will reduce community awareness and input as projects are reviewed, and will potentially lead to more city/resident conflict.

Thank you for your diligence and service on the Planning Commission.

Mark Grote, Secretary
Old East Davis Neighborhood Association
June 21, 2018

To: Davis Planning Commission
Re: Davis Live Project

I am the former Assistant Director of Housing Facilities and have been involved with projects in the Oxford Circle Community since 1986 when the University acquired the residence halls in the area. For the last 9 Years I have been the Resident Manager of La Casa De Flores at 517 Oxford Circle. So I am very familiar with this neighborhood and have the experience of managing apartment housing.

Over the last few years the vacancy factor in apartment housing has been extremely low. This has caused the city and the university to scramble to address this problem. This is not the first time the city and university has this faced issue. The city has already approved several large projects (Sterling, Lincoln 40) to address this problem. The University is working on plans in West Village and Orchard Park. The recent approval of Nishi Project by the voters will also make and a big dent in the present lack of available apartments in the city.

The Lot at 525 Oxford Circle is also an appropriate place to build new apartment housing. However, we are looking at an area that is already one of the densest neighborhoods in the city. The present Davis Live does not fit in with the neighborhood of three story buildings. The Davis Live project exceeds the City of Davis General Plan density standards by 36%. I doubt that even a seven story building would even be approved in downtown. A more reasonable proposal needs to be presented that provides for 240 not 440 beds.

When you have as many as eight unrelated individuals sharing an apartment you need more than 1 parking spot per apartment. Right now there is no available city street parking in the area when the University is in session.
Oxford Circle has only 39 spaces. Wake Forest and Russell Blvd are always jammed with cars.

It been has been my experience that 30-35% of residents over the last 9 years will have cars. The plan I saw of the Nishi project (Tandem Properties has a lot of experience with apartment needs) provided parking for 33% of the 2200 apartments. If you approve the Davis Live Project with 440 residents it will add 70 more residents looking for parking in the City which is already maxed out in this dense area. If you reduce the number of beds in the Davis Live project to 240 then the existing 71 parking spaces present will accommodate the residents without impacting the area.

The University houses freshman students and does not allow them parking privileges. But that does not stop them from using city spaces in the area. In 2016-17 the Housing Office offered 45 exceptions to freshman students so they could park in the lots around the residence halls. These lots will no longer exist once the renovation of Webster and Emerson are completed. These renovations of the residence halls will add 150 beds to the area by 2021 adding additional pressure on the parking in the area.

I also noticed that the Davis Live plan includes 441 bike parking spaces. Not everyone has a bike. It has been my experience over the last 9 years that about 85% of residents have a bike. Also I understand that the bike racks proposed are the lifting hanging up type. I don't think they will be used by a small person with a heavy bike.

There are some very nice mature trees right on the property line on east and west sides of the Davis Live property it would be nice to save these trees. Increasing the set back to 15 feet on east and west sides of the property might save these trees.

You have already taken steps to improve the current apartment shortage. The Davis Live project is an appropriate place to add beds, but don't over crowd this already dense neighborhood. Don't over react to the current crisis. You are making plans that will affect this neighborhood for the next 40-50 years. A 4-5 story building with 240 beds is the max the area can handle.
Planning Commission, City of Davis
23 Russell Blvd., Suite 2
Davis, California 95616
RE: 525 Oxford Circle

My name is Randy Dodd.
I wish to protest the project at 525 Oxford Circle.
The project is too large for the area, the building is too high (too many stories) and the project needs to be downsized to a more reasonable level.
Also, there is insufficient vehicle parking and bike parking for this city.
Please do not allow the General Plan Amendment.

Thank you,
Randy Dodd
1115 Stanford Pl
Davis CA 95616

Signature:

Date: May 22, 2018
From: Cindy Gnos
To: Cindy Gnos
Subject: FW: comments for Davis Live Development
Date: Tuesday, July 17, 2018 12:41:37 PM

From: Linda Chang
Sent: Wednesday, May 23, 2018 12:37 PM
To: Eric Lee
Subject: Fwd: comments for Davis Live Development

Eric,
Please pass this onto Catherine, who you indicated would be handling tonights meeting in place of Heidi Tschudin. Sorry, unfortunately, my laptop indented the margins, therefore shifting the sentences.
Many thanks for your help. Could you please confirm that you did receive this email?

-Respectfully,
Linda Chang
cell: 510-364-7041

From: donutbear@aol.com
To: htschudin@cityofdavis.org
Cc: manager@lacasadeflores.com
Subject: comments for Davis Live Development

Dear City of Davis Planning Commission:

This correspondence concerns the new Davis Live Development for 525 Oxford Circle.

My name is Linda Chang and I am one of the Trustees that owns and manages La Casa de Flores Apts (517 Oxford Circle) next door to the proposed new development of Davis Live.

My family has owned La Casa since the late 1960's (and even my siblings and I attended and graduated from UCD in the early 1970's), and therefore we are very familiar with not only this central area of town, but also the Davis community, as a whole.

While we understand the the Latigo Group needs to recoup their $5.4 million investment, the proposal to build 7 stories, AND increase the density of this already dense living area, is outrageous.

The following summarizes our issues for the project:

* PARKING: The Latigo Group proposes 71 spaces for vehicle parking (1 space per "living unit")
  According to their marketing research which indicated there are fewer cars being driven by the students, and therefore less parking being needed, there will be perhaps (on the conservative side) at least 20% (74 vehicles) of the remaining 369 Davis Live residents that will be looking for parking. Where are they going to park? They will be fighting for street space that's already being challenged for the last several years in the already dense living area.
* NOISE: Higher Density, more noise complaints. Especially true looking the the "Group Gathering Area" of Latigo's plan, and their "Club Room" (game and media facilities; 3100 sq ft) and "Study Lounge" (1500 sq ft). How does one manage occupancy level that's already at a high level? * Plans for an Outdoor Projection Wall for movies and sporting events? Outdoor noise; more complaints. City Police will need to gear-up.

* SAFETY: 7 Stories. Do the firetrucks in the City of Davis have the capacity to handle such a tall structure? (84 feet). Will the City need a bond measure to add a fire truck that has that ladder stretch?

* Trees along Russell Blvd: The Latigo Group's rendering of the project seen from the Russel Blvd showed the old oak trees taken out. Aren't these on the endangered species list?

* Trash: Adding an "amenities area" that might include coffee bar/ snacks, would bring in more trash in the area along Russell Blvd.

In summary, a building does need to be built at this site, but not at the risk of adding severe issues that would lead to additional noise, safety, parking challenges in this already crowded area.

Your consideration in these issues would most greatly be appreciated.

-Respectfully,

Linda Chang
Trustee, La Casa de Flores Apts.
La Casa, LLC.
May 22, 2018

Davis Live: Comments for Planning Commission

Dear Commissioners,

I would appreciate it if you could carefully visit both my praise and criticism of the form and function of - and the form of the process for - the proposed Davis Live apartments on Russell Blvd. in Davis.

Form and Function

Bicycle parking, vehicle parking, beds

The beds-to-cars ratio is great. The beds-to-bikes ratio is adequate if everyone has one bike on average, but the developer’s claim that they are going above requirements is not exactly true, since the regulation of one bedroom to bike assumes one bed in that bedroom.

However:

1. The All new housing in Davis should prioritize housing over car-parking within the same potential footprint. (Students are sleeping in their cars in part because cars are sleeping where students could be!) There is no real justification for having any cars on-site and in the Davis Live interior(aside from carshare and what’s required for ADA.). When asked about this at the BTTSC meeting on May 10, 2018, the Davis Live team member said they felt this was the right amount: There was so presented formula. In the same footprint, an second underground level for about 70 cars could cost an extra $3.5 million, and it could take a long time to-recoup that so it’s clear why that there is a secondary interest in not building it.

2. The planned configuration - and thus the working relationship in real time - of bicycle and motor vehicle parking is problematic: It has bicycles sharing a tight space with cars that has e.g. vehicles going from bright outside light to the interior, right before they need to check for bikes. Also, anything besides electric vehicles produces bad smells (at least).

3. The planned bicycle parking is admirable as mentioned in term of quantity but severely deficient in regards to egress both from the north side of the building - see no. 2, above - and the south side, Russell, since in the latter case it requires going through two doors, one of which is shared with everyone. After one has parked their bike, they need to exit the door they came in, enter a
second set of doors to the lobby and then a third to the stairs or the elevator. (Car drivers, on the other hand, have to use half as many doors to go upstairs after they leave their vehicle.)

4. The parking room itself - based on visualizations and technical renderings - has several aisles with very limited clearance, especially to take a bicycle down or put it up on the top level of a two-tier rack. There’s also no space for larger bikes of any sort, from long-tails to larger cargo bikes, and no clarity on where electric-assist bikes will re-charge.

5. Further in regards to real use, a tenant and a guest arriving on separate bikes when the bike room is full or reserved for tenant bikes will first have to see if there is guest parking in front, and if not have to go to the rear, and then if they find that take a third step and park inside the room. The outside parking in standard dumb racks is not nearly as safe as the interior parking. And leaving towards Russell is difficult if a pair has the bikes in the two different locations.

6. At the Social Services Commission review on May 21, 2018 the Davis Live representatives were asked how it would be decided which residents could get one of the 70 or so spaces. They said it would be based on need, but - outside of ADA-related need - it was not clear now this would be established. Would someone have to prove they had a job somewhere difficult to get to by public transport or bicycle? What if they leave this job? Further, there was no clear way presented why every student in a particular unit could not get car parking if they wanted. Seniority was offered as an expected way to assign parking, but would there be points to determine who had more need, the resident who’d lived there longer, or the one who had to get to a job in Winters? If, for example, every unit had a car, then it’s likely the car would be used for communal activities such as shopping, and possible that the owner would let their roommates borrow it. Either scenario would significantly reduce the demand for both carshare and larger cargo bikes. Finally, that in the same apartment unit some have cars and are in single rooms, and others have bikes only and share a room, social disparity is unnecessarily created.

7. Better cycling facilities and provision increases choices for people who have a car, and better cycling and carshare facilities and provision increases equity if it helps lower-income residents be mobile while keeping their expenses low. The latter should be the operating philosophy for what Davis Live describes as its “mobility hub”, as it also provides solutions that address the former. Superior provision of alternatives to the private car are maximized when those provided with these forms of mobility do not have their own car.

8. Beyond the mobility subject, Davis Live has too many bathrooms per bed, approximately 1 to 1.5. Bathrooms take up space and cost more per m2 than bedrooms.

**Russell Blvd.**

1. The lack of traffic from cars with this project is obvious, but LOS impacts tell a very limited story. Davis Live - and other existing and re-developing projects on both sides of Russell - will
produce a significant amount of bicycle traffic that uses cycling infrastructure not considered in a LOS evaluation.

2. Russell Blvd has significant motor vehicle traffic on four lanes, its median encourages people to cross mid-block, and its intersection with Sycamore is congested at times with bikes, and is not actually optimized for them (e.g. the lack of direct access not via the sidewalk to the most direct route to Trader Joe’s and its bike parking, and the lack of more than a ped crossing for the north-side-of-Russell multi-use part at Sycamore. This Class I path is much narrower than the one on the south side of the street, and only starts west of Sycamore on the north side of Russell. Davis Live by itself will add hundreds of daily trips by bike and foot to the north side of Russell.

Solutions:

1. Remove all the private parking from the lowest level of the building, with the exception of what’s required from ADA, and possibly a bit more (as with the request for bike parking beyond requirements) and space for electric carshare vehicles and large shared e-cargo bikes that can change over time. The number of carshare vehicles provided is generally about 12 to 20 per carfree user, but that’s for projects with a much lower bicycle modal share, and no shared cargo e-bikes. For 440 residents, among whom perhaps only ¼ will have drivers licenses, 10 carshare cars should be sufficient, and the same number of e-cargo bikes (by the way the very best e-cargo bikes cost about $5,000, but cost much less to run than electric cars.) All of these will be on the north side of the building, accessed via a wide hallway from the south to the north of the building.

2. Within the limits of efficient-building techniques - which e.g. have all bathrooms on multiple floors on the same sewage and possibly water input lines in a stack - Davis Live should move closer to 2 to 1. This is optimized if bathrooms are configured in a way that are primarily for certain residents but can be used in a pinch by their apartment mates. This requires that at least some bathrooms have doors or additional doors that access common areas of the apartment.

3. Create a combination of one of the two following:
   a. Combo One:
      i. Re-locate the bicycle parking from the west side of the building to a bridge over Russell St. which would land on the north side in the Davis Live building’s second floor Outdoor Amenity Plaza, with a security door here. The bicycle parking itself would extend as far as approximately the middle of Russell, and be located on one side of the bridge only, and provide a generally-linear-configuration of two to four rows, with two doors (one at either end), with sufficient and flexible space inside for residents and longer-term/overnight guests to park their bikes of any reasonable size, security doors accessible by residents with a card or smartphone, and also residents should be able to assign very short term access to their verified visitors so that
they can both enter the parking without the resident having to meet them, and so that they can leave on their own, though they’d also have to be buzzed in at the north side of the bridge where it meets the building, or it may be preferable that visitors who do not require level access take the stairs down from here and then get buzzed in to the ground floor entrance. The bridge would be covered from the south end of the parking area to the building. The south end of the bridge would land either on Orchard Park Drive or Russell east of Orchard Park Drive or both. (The re-construction of the Orchard Park area may have some effect on this.). The bridge would have an additional ramp on the north side of Russell, landing west of Davis Live, making it easy for a significant number of cyclists to safely cross Russell from the west, northwest and north of Davis Live. There would be a staircase down to Russell. Public ADA-compliant access to the rental office directly from campus would be provided by the west ramp, or also Davis Live staff could meet the visitor upstairs. Public ADA-compliant access to the rental office would also be possible from dedicated visitor ADA-parking on the street, or via the shared path on the north side of Russell.

ii. Create as many additional apartments as possible on the first floor facing the south, east and liberated west walls, ideally with a lightwell or similar running north-south in between them that’s connected to the Outdoor Amenity Plaza on the second floor above, and connected to the wide north-south hallway that goes from the elevator to the back of the property.

b. Combo Two:
   i. Re-locate the bicycle parking from the west side of the building to its Russell frontage, which a single door, directly to the street, at street level, daylight, with sufficient and flexible space inside for residents and longer-term/overnight guests to park their bikes of any reasonable size. This should have an interior door that will create the shortest possible route to the elevator and stairs. Any security card used for this door and the one for the door to the street should be accessible by residents with a card or smartphone, and residents should be able to assign very short term access to their verified visitors so that they can both enter the building without the resident having to meet them, and so that they can leave on their own as well (the latter if the interior door is also secured in a similar manner to the front one.)

   ii. Create as many additional apartments as possible on the first floor facing the east and liberated west walls, ideally with a lightwell or similar running north-south in between them that’s connected to the Outdoor Amenity Plaza on the second floor above, and connected to the wide north-south hallway that goes from the elevator to the back of the property.

   iii. Create a roundabout with bicycle priority - NOT the solution used at the Cannery-East Covell-J St - but more like this - for the T-intersection of Russell
and Orchard Park Drive, with the option of - viewed looking north - the 3 o’clock position open so that motor vehicles can leave campus going west or east on Russell, but only enter here from the west. (It would safer for cyclists and improve flow on Russell if the something closer to the design from Zvolle was more directly-inspiring.) It’s likely that another traditional, signalled intersection so close to Alvarado will be favored by no one, and some kind of user-activated beacon is not appropriate where there will be a lot of bicycle traffic, and of course sorting this out flow-wise with the Alvarado-Russell intersection is complicated.

**Form of Process**

The final stages of the planning-approval process at Commission and Council level for Davis Live is very fast, with the Bicycling, Transportation and Street Safety Commission only seeing it once in early May, and the City Council making a decision only 24 or so working days later, and in between that the Planning Commission tonight and Social Services this past Monday (among others).

At both the BTSSC and Social Services meetings the lead architect did not show, and neither did any assistant architect or others on the engineering side. At both BTSSC, Social Services and presumably at the Planning Commission the same gentleman has spoken or will speak who is familiar with many aspects of the project but not the details of design. The material presented in the BTSSC, Social Services and Planning Commision packets contains designs which have not been altered - according to the dates on these documents - since April 2018 (i.e. before the plan was visited by the BTSSC). The narrative continues to mention that e.g. “Davis Live is located within a 5-minute walk to the Davis Downtown Core” (page 13), on Monday at Social Services, Jump Bikes - whose functionality could obviously improve any project - were described as “proven very popular with students”, even though the program had only been online for four days, the bicycle infrastructure designs seem to be created by someone unfamiliar with cycling and then not looked at by anyone on the team familiar with it, or at least knowing basics of useful bicycle parking configuration, and the manufacturer of two-tier bicycle racks seemed to be picked at random, because on their website I could find nothing approaching the quality of racks I’ve seen elsewhere that allow even small and not very strong persons to easily place a bicycle on the second level. Details matter, and it almost seems that the location of the movie space in the Outdoor Amenity Plaza was decided without knowledge that this is right above a noisy street.

I don’t see how it’s possible that what’s been suggested for the project can be incorporated let alone objectively considered for the project design by the time the information packet has to be sent out in advance of the City Council meeting on Thursday, June 7th.

It’s simply not appropriate for at least several key Commissions to visit a project like this less than two times, with the final time very close to the City Council meeting that will approve a project or not. It’s not respectful to appointed volunteers whose main job it is to advise the City Council to give them just a few minutes to speak on a project that will be around for 100 years and house perhaps 20,000 of their
neighbors during that time. Clearly there should be a formula etc. that requires a certain project to be visited more than once. (Right now, I’m preparing these notes for my second of two citizen-inquiries into Davis Live, with the first one only last night!)

Davis Live has great potential but we all need time to make it better. We have to be honest: It’s clear that it’s going to get approved, and almost certainly unanimously, so with that in mind I suggest that it would be more appropriate to let several key Commission visit it again (as briefly as necessary) and only take it to the new Council later this year, so that we can further optimize this useful project.

**Costs**

The planned rate for private rooms in apartments at Davis Live will be around $1200, and a bed for low-income students will go no lower than around $700. This is apparently based on the local market and relatively-cheap compared to the costs of living in dorms on campus. This is crazy enough on its own, but added to the cost of tuition and fees for attending UC Davis... it’s completely insane. The USA has failed students not lucky enough to get a scholarship or who are not independently wealthy. I’m trying to make Davis Live as good as possible, but in relation to this project I’ve definitely very nearly surrendered on this fundamental issue of housing rights.

Carfree and additional units of housing within the footprint of this location in Davis right across the street from campus will help students save money on mobility - and lower financial costs overall to society - and will bring income to developers than is planned. There is unfortunately no obligation for the Davis Live developers to construct one of my great ideas for crossing Russell, but the higher income will help them pay for it.

**Complementary Measures**

Any dis-obligation to parking entitlement needs to be handled holistically: Through various mechanisms Davis Live residents should not be allowed to park without restrictions nearby… let’s say within 5 miles of the project.

This can be facilitated by further extensions of the existing on-street parking permit area, and inability to register cars in town.

One idea under consideration is to build peripheral lots e.g. near freeway egress points for students living in buildings without parking. These lots still need to be paid for upfront, and the space would be much better utilized for Park & Ride for people in town who store cars on their own/rented property, or at mostly everyone else’s dime in the street in public space. Funding should be used for space for people, not for cars.
Quality of Life for the Community
April 26, 2018 Adopted by DCOC Board of Directors

The Davis Chamber of Commerce Board of Directors representing 514 businesses is supportive of projects that improve the quality of life in Davis. The Oxford Circle project, slated as a 440-bed student housing development, will replace an outdated and dilapidated structure that was previously used as a fraternity. Based on the chamber’s mission, this project is in alignment as it will increase the much needed housing supply while creating a vibrant space with a target of Gold LEED Certification. This project is centrally and conveniently located adjacent to the campus, including another student housing facility Thoreau Hall and will provide students easy access via walking or biking to both the University and downtown Davis.

We applaud projects like this that are focused on increasing density while maximizing and activating the area along Russell Blvd with options for increased pedestrian and bicycle traffic.

Housing Supply

The Davis Chamber of Commerce generally supports the goals and policies of the Davis General Plan’s Housing Element which promotes an adequate supply of affordable ownership and rental housing for local employees, students, low income and disabled persons, and seniors (2001 General Plan Goals 6.1 and 6.2).

Specifically, the chamber supports the city standards and actions which implement these goals and policies, including:

- Providing a range of unit sizes and a mix of housing types, densities, designs, prices, and rents (General Plan Policy 1.1);

The Chamber consistently supports vibrant housing development projects and encourages the council to review the essential aspects when considering land-use, development opportunities and General Plan considerations. Davis’ distinctive community, which include UC Davis, a unique Downtown experience and other marketable amenities should be used as leverage and promoted when appropriate and possible. The Davis Chamber of Commerce seeks to promote jobs and industries that provide a positive economic impact including providing quality jobs to our residents.

The mission of the Davis Chamber of Commerce is to promote, support and advocate on the general economic vitality of its membership and the quality of life for the community.