4 ENVIRONMENTAL CONSEQUENCES

This chapter describes the probable impacts of each alternative. The chapter is divided by type of resource affected such as geology, air quality, noise impacts, water quality, natural environment, cultural resources and visual impacts. The following technical studies from which these sections are derived are incorporated by reference into this Final Environmental Impact Report/Statement and are available for viewing at the Department of Transportation, District 3, Sacramento Office, 2389 Gateway Oaks Drive, Sacramento.

Air Quality Report
Noise Impact Report
Location Hydraulic Study
Water Quality Report
Visual Impact Assessment
Initial Site Assessment
Initial Site Assessment Update
Revised Alternatives Analysis
Community Impact Assessment
Natural Environment Study
Historic Properties Survey Report
Historic Architecture Survey Report
Finding of No Effect
Traffic Studies
Final Relocation Impact Report

In some cases, such as with air quality and geography, impacts to the resource will be looked at in general terms rather than by specific alternatives. For resources where impacts vary by alternative, then the impacts are evaluated by alternative.

4.1 SOCIOECONOMIC IMPACTS

4.1.1 Land Use Impacts

Land use impacts are evaluated in terms of consistency of the proposed project alternatives with local plans. The City of Lincoln's General Plan has a policy to pursue the construction of a SR 65 Bypass. The original proposed SR 65 Bypass, adopted by the California Legislature in 1964, was intended to be located west of the existing SR 65 alignment. In the intervening years, since no right-of-way had been purchased, development has precluded the viability of the adopted alignment as the proposed route. The circulation element of Lincoln's General Plan, updated in 1988, designated the future location of the Bypass along the AC corridor between Joiner Parkway and the Lincoln Airport. Since that time, the updated Circulation Element (1994) has designated the D13 alternative as the location of the future bypass. In addition, the City is currently updating the General Plan and will designate the D13 North Modified as the preferred alternative.

The following sections describe the potential effects of the project by subject.

Agricultural Impacts

Agricultural land is the dominant community type in the Study Area, with approximately 42.4 percent of the Study Area classified as agricultural land in the Natural Environment Study (NES). The impacts to agricultural land vary from 51 ha (126 ac) for the AAC2 alternative up to 102.11 ha (252.3 ac) for the D13 alternative.

All of the alternatives will impact prime, unique, statewide, and locally important farmlands. Completion of the Farmland Impact Rating (See Chapter 7, Comments and Coordination and Appendix D, Farmland Impact Rating Form) showed that alternatives, A5C1 and AAC2 had point values of 158, and 157. The D1 and D13 point values were 162 and 161, respectively. The D13 South and North Modified Alternatives values were both 147.

Table 4-1 shows the amount of agricultural land in the study area. The D13 North Modified Alternative impacts 234 acres of various agricultural land. This represents 0.01 percent of the total area within a 4-mile buffer around project, which would not be a significant impact under CEQA.

Table 4-1 Agriculture in Study Area

Use or type of land	Farmland within Four-mile Areas	% Of Total Four-mile Areas
Grazing Land	3,356 acres	12.6%
Farmland of Local Importance	12,534 acres	46.9%
Prime farmland	3,398 acres	12.7%
Farmland of Statewide Importance	833 acres	3.1%
Unique Farmland	2,706 acres	10.1%
Other	1,441 acres	5.4%
Total Farmland and Other	24,268 acres	100.0%
Williamson Act Parcels	6,638 parcels	86.4%
Non-Renewed Williamson Act	1,042 parcels	13.6%
Total Parcels in Four-mile Areaa	7,680 parcels	100.0%

Residential

The Placer County general plan has a policy to promote the concentration of new residential development in higher-density residential areas located along major transportation corridors and transit routes. Although alternatives D1 and D13 North and South Modified would have rerouted the SR 65 alignment away from both Lincoln and Sheridan and alternatives A5C1 and AAC2 would have rerouted SR 65 away from Sheridan, the preferred alignment, D13 North Modified, runs relatively parallel to the two towns' western borders.

The City of Lincoln's goal and supporting policies generally address the need to ensure sufficient residential development to meet community needs while discouraging

leapfrog or premature development. By implementing the use of planned development projects, Lincoln has ensured that development would proceed with the needs of the community. The recent population growth in the Sacramento region has generated a demand for housing in the surrounding areas. According to the California Dept. of Finance and SACOG, there are currently 9,964 housing units in Lincoln with 24,964 projected for the year 2025. Lincoln has begun to accommodate this housing and has recently constructed and permitted several developments within the City. The City of Lincoln is also proposing in their draft 2050 General Plan to expand the sphere of influence out past Dowd Road to the west. The proposed project does not have an impact on Lincolns current housing situation.

Similar to Lincoln, Sheridan has also adopted the goal to provide adequate housing for its residents although currently it is under a moratorium on new construction due to their inability to meet sewage and water needs. None of the alternatives would impact Sheridan's current housing situation.

Industrial

Placer County, Lincoln and Sheridan have all adopted the goal to designate adequate land for industrial development to meet the present and future needs of all Placer County residents. There will not be any industrial units displaced by the project.

Despite Lincoln's historically modest industrial development, it appears that as new nationally recognized industries move into the Roseville/Rocklin area, Lincoln has also been receiving attention as a market prime for industrial expansion. With approximately 605 ha (1,494 ac) of vacant industrial land available there will not likely be any impacts caused by the construction of the Lincoln Bypass to industrial land uses currently defined in the general plan. Moreover, construction of the Lincoln Bypass will improve travel conditions along SR 65 that will meet the demands of anticipated industrial growth.

Commercial

Similar to the industrial land use goal, commercial land use goals and policies for Placer County, Lincoln and Sheridan are to designate adequate land for commercial development to meet the present and future needs of all Placer County residents. Five of the nine mixed-use planned developments have set aside commercial land totaling 107.6 ha (266 ac).

The Draft Relocation Impact Report (DRIR) identified two businesses that would be impacted by the D1 and D13 alternatives; a well drilling business and a duck club, each of which have one to three employees. The A5C1 and AAC2 alternatives would displace the duck club.

The final Relocation Impact Report (FRIR) for the preferred alternative (D13 North Modified) has identified three businesses that would be impacted: a well drilling business, nursery and duck club.

4.1.2 Growth Inducement

Growth inducement is also discussed in the Indirect and Cumulative Impact Analysis, which can be found in Appendix I. The analysis includes information on land use, general plans, city and county policies on growth, current zoning and possible changes that can be reasonably foreseen to impact growth.

The following section addresses the direct or indirect ways in which the project may foster economic or population growth or the construction of additional housing in the surrounding area. Factors that influence growth include the cost of land, local government plans and policies, articulated public attitudes, cost and labor pool, land use and terrain, commute time, access, infrastructure and facility constraints. The effect of transportation improvements on growth is not easy to measure since it is only one element of the many factors influencing growth. Generally, Caltrans responds to a need that usually shows up as congestion or an increase in accidents in an area. Therefore, Caltrans does not directly cause growth- growth is already happening, causing congestion and decreased safety, which causes Caltrans to propose a solution to the congestion or safety issue.

That being said; as one of the factors that influence growth, transportation projects can have an indirect effect on growth. Studies have shown that development will likely occur when new roads allow access to land previously inaccessible and the area is prime for development. A new roadway may create additional market pressure for growth because one constraint for development has been lifted. However, whether or not the project will induce unplanned growth depends on political, physical and socioeconomic constraints as well. The proposed project is intended to meet the existing and/or projected traffic demand based upon the current local land use plans. At the present time, other constraints limiting growth are in place such as zoning and General Plan elements that express a desire to retain the agricultural element in the project area.

The City of Lincoln has been one of the fastest growing areas in the State and is accommodating this growth with their plans and policies. This growth has occurred regardless of the transportation infrastructure not keeping pace with the need. Factors that have contributed to the growth occurring in this area are lower housing prices, proximity to job centers, the rural quality of the town and a positive economic climate.

The following paragraphs contain a summary of the factors that can influence growth in an area. With the exception of facility constraints, the decision making involved is by the local agencies, and not within Caltrans purview.

Cost of Land

Lincoln is included in SACOG's list of fastest growing communities that also includes Rancho Cordova, Vineyard, Cosumnes and West Sacramento. The City of Lincoln is projected to have a population of 33,211 in 2025, up from 26,661 in the year 2005 (http://sacog.org/demographics/projections). The fastest growing housing markets in the Sacramento metro region are in the communities of Laguna, Rancho Cordova, Vineyard, Lincoln and Roseville. According to the California Dept. of Finance and SACOG, there are currently 9,964 housing units in Lincoln with 24,964 projected for the year 2025. The City of Lincoln's housing prices has been consistently lower than the surrounding communities of Rocklin, Roseville and Auburn, which has been a factor for people choosing to locate in Lincoln.

Although Placer County, as a whole, has land values higher than other counties in the region, the higher cost of land would not likely create a hindrance to unplanned development. Furthermore, accessibility to undeveloped land could cause minor shifts of economic development that would have otherwise have been built elsewhere in the same region. Nevertheless, development of the undeveloped agricultural areas would also rely on any existing farmland contracts and local policies set by governmental officials.

Local government plans and policies

Caltrans projects are designed to accommodate current and future traffic demand in accordance with local plans. Decision-makers in the City of Lincoln believe that growth and the accompanying increase in traffic is inevitable, and has developed strategies to manage it so Lincoln may retain the qualities of life that its citizens desire.

Local approvals for mixed-use developments up to this point have not been contingent upon the construction of the Lincoln Bypass. It is possible that portions of the Lincoln Bypass could be funded by approved and built developments; consequently, the Bypass would be a response to the growth planned by the City of Lincoln.

The City of Lincoln is currently in the process of updating its General Plan to designate areas where development will occur. The City of Lincoln is considering annexing a portion of the county located to the west of Lincoln and along the preferred alignment. In the 1988 update of the General Plan the City determined that the adoption of the proposed Land Use Element would cause significant growth inducing impacts, resulting in levels of population and urban development in excess of that which would otherwise occur within the existing city limits under the former General Plan. The

distribution and concentration of population would also be increased by adoption of the Land Use Element. These impacts were found to be both significant and un-mitigatible.

Placer County has placed a moratorium on development in the rural area northwest of Lincoln and considers Lincoln's provision of an urban level of service adjacent to agricultural lands to have the likely effect of placing development pressures on these rural areas. The "Build" alternatives could contribute to development pressures on the agricultural lands northwest of Lincoln by way of providing better accessibility than is provided by the current circulation system. By contributing to the necessary infrastructure, A5C2, AAC1, D1, D13, D13 South Modified and D13 North Modified, could indirectly influence the location, distribution and density of future development in both Lincoln and rural areas surrounding Lincoln's sphere of influence.

Portions of agricultural land adjacent to the bypass are owned by investors and hence are more likely to develop if conditions within the City allow for such development. The majorities of investors are located within the City of Lincoln or are within the proposed future annexation of the City. The remaining investors are within close proximity to the bypass but are in areas currently zoned agricultural land and not within the City or the proposed annexation. Development could potentially occur as the City of Lincoln grows and if zoning is changed in the area. Nevertheless, local officials ultimately influence changes in land use distribution through amending general plans and approval of development permits.

Land Use and Terrain

Lincoln's existing land use controls involving design and property development standards have not been a constraint to area development. Even with the "No Build" alternative, significant growth in the City of Lincoln is projected. Regardless of the alternative chosen, any growth beyond the City of Lincoln would require the approval of Placer County officials and/or additional area to be adopted within Lincoln's sphere of influence.

The Study Area's prominent agricultural influence is partly due to the abundance of relatively level ground with a variety of soil types. Historically, developing areas have had few natural obstacles to impede growth and development with the exception of some prominent ravines. Rocklin and Roseville located to the south, Sheridan to the north and the foothills to the east direct this growth naturally to the west towards the airport. At this time, the area west of the bypass is zoned as agricultural. Development projects must coordinate with the respective responsible resource agencies to comply with environmental laws and regulations. Although compliance with environmental laws and

regulations may be lengthy and delay projects, development projects in the Study Area generally have few other barriers.

Articulated Public Attitudes

The concern over development pressure that will be occurring over the next 20 years and the possibility of losing County natural resources prompted the creation of Placer Legacy by Placer County. Placer Legacy was established in 1998, using three working groups to provide input from a variety of stakeholders. These groups consisted of a Citizens Advisory Committee, an Interagency Working Group and a Scientific Working Group. Placer Legacy has identified County trends, resource conflicts and possible strategies to address growth pressures. Strategies currently being pursued are land acquisitions and conservation easements, agency coordination, education and incentives. In November of 2002, Placer Legacy was actively negotiating purchases with property owners for approximately 526 ha (1,300 ac) of conservation easements west and north of the proposed Lincoln Bypass to limit growth-inducing impacts. That number has risen to 834 ha (2,060 ac) of land protected in the Sierra Nevada, Sierra Nevada foothills and Central Valley. In addition, the Placer Legacy is involved in the Miners Ravine Restoration project at the Miners Ravine Reserve site in Granite Bay, the Auburn Ravine/Coon Creek Ecosystem Restoration Plan and the American River Fuel Load Reduction Plan as well as engaging in ongoing coordination with the Agricultural Commissioner's Office on matters related to agricultural conservation.

Placer Legacy's funding comes from a variety of sources including grants, general funds, mitigation funds, donations, acquisition funds, resource agencies and other miscellaneous sources. Voters defeated a ¼ cent sales tax proposed to provide a secure source of funding for Placer Legacy. However, the County and Placer Legacy are initiating a public outreach program in order to promote the Placer Legacy in the community with the goal of re-introducing the measure to the voters.

Although grass roots efforts are forming to address growth issues in the area, the majority of the residents are in favor of the Bypass due to the increased congestion occurring along the existing SR 65 through the middle of the City. Based on the comments from the Open House held for Lincoln Bypass on Dec 18, 2001, the majority of the Lincoln residents in attendance were in support of the D13 North Modified Alternative.

Sheridan is a rural community beyond Lincoln's sphere of influence that will be affected by all the alternatives by way of bypassing the town. However, Sheridan's economic stability is not reliant on the existing alignment. The surrounding farming community, albeit small, also represents the rural community beyond Lincoln and will be

impacted by all the alternatives with the loss of farmland. Letters in protest of the alternatives have been received from some of the affected landowners because these alignments will impact their land. Many of the smaller farms have been passed on from generation to generation and are dependent on farming the land for their livelihood. Not only would the segregation of their land impact their normal farming activities, encroachment of potential urban development in the area would disrupt their lifestyle.

Cost and Labor Pool

Projections from SACOG's Final Interim Metropolitan Transportation Plan 2005/2007 show that the fastest growing employment markets will be in Roseville, Downtown Sacramento, West Sacramento, Rancho Cordova and Laguna, near Elk Grove. Much of the job growth will come in office and manufacturing jobs in these suburban areas. These suburban job centers will increase the demand upon transportation infrastructure and will place additional pressure on interregional travel options. Lincoln's proximity to Roseville and their own desire to capture retail and other types of employment will increase the demand on the housing stock and increase the pressure to develop further.

The Lincoln Bypass has been conceived to facilitate the planned growth of Lincoln and the anticipated expansion of the local workforce while providing for inter-regional travel. However, the City of Lincoln's plans and policies do not address the growth impacts from a growing workforce on the rural areas outside of the City's Sphere of Influence.

Commute Time

Travel time between geographic points may influence the redistribution of economic development and population. The current SR 65 alignment serves both local traffic and through traffic, whereas, the Bypass would divert the through traffic from the core of Lincoln where delays occur due to traffic signals and cross traffic. With the "no build" alternative, future planned development in Lincoln would strain the capacity for the existing roadway system to move traffic efficiently. Therefore, each build alternative will ease traffic congestion on the local system by diverting traffic from Lincoln's downtown business district. As Lincoln's planned developments are constructed, the bypass could also serve as an alternative route between Lincoln's northwestern and southern areas. However, the bypass will also provide direct travel access to undeveloped agricultural lands north and west of Lincoln. Consequently, increased access to undeveloped lands may attract a greater number of commuters willing to sacrifice the shorter commutes to live in rural areas.

Access

Access to the transportation system is one of several important factors affecting the development of land. In order to provide for expected growth in Lincoln, ultimately interchanges will be constructed at Industrial Avenue, Nelson Lane, Wise Road and Riosa Road. (See Traffic Summary, Chapter 1, section 3). The Riosa Road interchange would be necessary to serve as access to the Sheridan community. The Wise Road interchange would potentially serve as access for the rural community between Lincoln and Sheridan as well as Lincoln's northern region and would provide access to trucks in the area. In addition, the interchange at Wise Road would allow access to the airport, which the City is planning to expand. Although access to a major transportation system is critical to farm communities, a major interchange at Wise Road could add development pressures in this area.

The potential for development pressure led Caltrans to evaluate options that would relieve some of the pressure. Working in coordination with the regulatory agencies, Placer County and the City of Lincoln, a strategy to purchase conservation easements in the vicinity of the Coon Creek Watershed and Wise Road was developed. This conservation easement is now a part of the project description per the NEPA/404 MOU process.

Infrastructure

Lincoln is attempting to direct future growth in an orderly manner by building primarily around the downtown area and projecting outward to avoid leapfrog development that could result in inadequate infrastructure. Proposed developments in Lincoln will be reviewed by the city to determine if the existing developed areas are adequate or if urban reserves would be locations that are more appropriate. The Lincoln Public Facilities Element, as part of the General Plan, has mapped out the services and physical improvements that would be necessary for transportation, parks and recreation, schools, sewage treatment, police and fire, and city government for future planned developments and would be funded through developer's fees.

The City of Lincoln has built a wastewater treatment and reclamation facility off Moore and Fiddyment Road. The old wastewater treatment facility, currently located west of the City of Lincoln near Nicolaus Road and Nelson Lane, will be dismantled. The new facility will serve customers currently using the old wastewater treatment plant as well as the residents of the new subdivisions. Other minor infrastructure improvements include well sites for back-up water and peak demand purposes.

Many of the local road improvements are being planned to accommodate the expected growth under the new general plan. Local officials have indicated that many

local roads are currently being heavily used to bypass the congestion in the city. In the unincorporated areas, the lack of urban services such as water and sewer treatment will likely deter unplanned development.

4.1.3 Social Impacts

Title VI and Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice (EJ) in Minority and Low-Income Populations*, signed by the President on February 11, 1994, directs Federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and negative effects of Federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. No minority or low income populations have been identified that would be negatively impacted by the proposed project as determined above. The proposed project will not result in disproportionate impacts to minority or low income populations.

It is the policy of the California Department of Transportation, in accordance with the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, 49 CFR 21 and related statutes and regulations that no person in the state of California shall, on the grounds of race, color, sex, age, national origin, religion, or disabling condition, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity administered by the Department.

Section 3.1.5 describes the demographics of the project area. Some minorities, elderly and physically challenged persons may potentially be relocated depending on the alternative ultimately chosen. However, considering the relatively low total numbers of people that may be affected, the overall impact to these groups will be minimal.

Census 2000 shows the following blocks as having a high percentage of minorities: 213.03, 213.04 and 214.02. This area is located in close proximity to the existing alignment but is not expected to incur impacts from any of the proposed alignments.

Census tract 214.02 was identified to have the highest population of persons below poverty level, consisting of 15.8 % of the population in the census tract. Since the 1990 census data has been collected, a portion of census tract 214 has been planned for new development. Since it is assumed that low-income people will not be buying these higher priced new homes, it is predicted that the mean percentage of low-income people will decrease. The project will not have a disproportionate impact on minorities or low-income families. This project will also not discriminate, exclude from participation or deny benefits to any person on the grounds of race, color, sex, age, national origin, religion, or disabling condition.

Community Cohesion

Table 4-2 shows that all of the proposed alternatives would impact residential neighborhoods. The alternatives AAC2 and A5C1 would have had the greatest impact on people living in single-family residences with direct impacts amounting to 461 and 469 respectively. The considerable amount of displacements expected for alternatives AAC2 and A5C1 would largely be due to the recently planned and constructed developments.

Table 4-2 Residential Displacement Properties for Each Alternative

Type of Residence	A5C1	AAC2	D1	D13	D13 North Modified
Single Family	458	466	14	6	4
Mobile Home	3	3	6	4	4

The AC alternatives have a much greater community impact than the D alternatives. During the ten years between concurrence on the range of alternatives and the present, growth in Lincoln has skyrocketed. Several developments have been approved or are already built within the AC alignment. A recent count of residences affected by the project shows that the A5C1 alternative would have impacts to approximately 461 residents and the AAC2 alternative would have impacted 469 residents. The AC alternatives would have split established communities as well as recently constructed communities such as the Foskett Ranch and run adjacent to a proposed elementary school, separating it from the communities it would serve on the other side of the highway. Purchasing right-of-way and relocation efforts would have caused the project costs to escalate by at least $16,000,000.

Comments voiced during open houses from the public in the existing community along the AC alternatives have voiced a passion towards their choice in moving to a smaller, more rural community that allows for a more intimate atmosphere among neighbors. The communities that would have been impacted by the AC alternatives belong to neighborhood watch programs. A neighborhood watch program is an example of a group that is committed to a community and demonstrates cohesiveness.

An alternative that would separate the community, pose safety problems, place a barrier to mobility between neighborhoods and increase noise to the level that would require soundwalls, may have an impact to the "intimate" feel that has attracted these residents to Lincoln.

Long-term effects on property values can occur when a transportation project cuts through existing communities. Many factors are considered when determining the extent of the impact on property values of a freeway or major highway such as the character of the neighborhood, supply and demand of homes, community services and other socioeconomic factors. Generally, properties abutting freeways do not appreciate in price and in some cases are priced 0.5% to 16% lower than properties further removed from the highways.

CEQA

Community impacts are often hard to measure due to the lack of analytical information. There are no standards or formulas that can be used to compute short and long-term impacts when an alternative divides a community and determining significance is often subjective. The CEQA guidelines provide some questions to ask when determining whether a project impact is significant. The degree to which the question can be answered affirmatively dictates the level of significance.

Will the project:

- Disrupt or negatively affect a property of cultural significance to a community or ethnic social group,
- Induce substantial growth or concentration of population,
- Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system,
- Displace a large number of people,
- Disrupt or divide the physical arrangement of an established community;
- Conflict with established recreational, educational, religious or scientific uses of the area,
- Convert prime agricultural land to nonagricultural use or impair the agricultural productivity of prime agricultural land, or
- Interfere with emergency response plans or emergency evacuation plans.

In determining impacts to community cohesion and effects on property values, certain characteristics may provide insight as to whether or not a significant effect will occur. For example, a community is considered cohesive if it is determined that the residents have a "sense of belonging," whether they have a level of commitment to the residents of the community and neighbors, groups and institutions. Significant impact need not be determined by the length of time a community has been in existence but may be determined by the level of shared activities, ethnic group clusters and personal contact in addition to other social factors.

Although an exact determination cannot be made on the long-term impacts of the property values, it can be reasonably stated that since the AC alternatives and the D1 alternative divides existing communities, this may pose long-term socioeconomic impacts, which would change the dynamics of the existing community and could lead to a decrease in desirability of the neighborhoods. Therefore, the AC alternative would pose a significant effect under CEQA.

In contrast, the D13 South and North Modified alternative would not divide any existing communities. Although the D13 South and North Modified alternative would result in impacts to other resources, as would the AC alternative and the D 1 alternative, the overall impacts to resources and socioeconomic factors are less damaging when compared with the D 13 South and North Modified alternatives. The D 13 North Modified would not have a significant impact under CEQA.

Access and Circulation

The construction of the bypass will limit the amount of access points from cross streets. All of the alignments will create a barrier from central Lincoln to the surrounding planned developments and the outlying areas within the study area. However, access will be provided by constructing overpasses, interchanges or intersections at existing or proposed major roads. Table 4-3 outlines the overpasses and interchanges proposed for each alignment. Furthermore, the bypass will improve operations by bypassing the railroad crossing in Sheridan.

If the project were not built, congestion in the City of Lincoln would continue to worsen. Additional traffic from growth associated with development along the study corridor would create substantial delays and long queues for motorists trying to utilize the existing highway system. Circulation within the city would be difficult. Operational improvements would continue, including additional signals or widening for turn lanes for added capacity in some areas. However, additional signals would cause further delay and congestion to what is already being experienced.

Table 4-3 Overpasses and Interchanges at Local Streets

Cross Street	Alternatives					
	A5/C1	AA/C2	D1	D13	D13 South Modified	D13 North Modified
Industrial Ave.	I/C	I/C	I/C	I/C	I/C	I/C
Ferrari Ranch Rd.	O/C or U/C	O/C or U/C	O/C or U/C	U/C	U/C	U/C
Moore Road	CDS	CDS	CDS	CDS	CDS	CDS
Nelson Lane	N/A	N/A	I/C	At Grade Intersection (I/C planned by City)	At Grade Intersection (I/C planned by City)	At Grade Intersection (I/C planned by City)
Nicolaus Road	I/C	I/C	O/C	O/C	O/C	O/C
Wise Road	I/C	I/C	I/C	I/C	I/C	I/C
Dowd Road	O/C or CDS + FR	O/C or CDS + FR	O/C or CDS + FR	O/C or CDS + FR	O/C or CDS + FR	CDS + FR
Dalby Road	CDS	CDS	N/A	N/A	N/A	N/A
Riosa Road	I/C	I/C	I/C	I/C	I/C	I/C

I/C=interchange O/C=overcrossing N/A=not applicable; alignment does not cross road CDS=Cul de Sac FR=Frontage Road
(All alternatives include a partial interchange at Industrial Boulevard and at-grade intersections with right-of-way for future full interchanges)

Parking Impacts

No parking impacts are anticipated with the construction of any of the alignments. In fact, by bypassing the existing alignment through the City of Lincoln it is expected that parking will be easier for shoppers within the City of Lincoln. Furthermore, relinquishment of the existing alignment would also allow the City of Lincoln to reconfigure parking to provide extra spaces if desired.

4.1.4 Relocation Impacts

As shown in Table 4-4 all of the proposed alternatives would have some impact on residential neighborhoods. Alternative AAC2 would have the greatest impact on people living in single-family residences with impacts to housing amounting to 469 homes. Similarly, the A5C1 alignment would also have impacts to 461 residences. The considerable amount of displacements expected for both these alternatives is largely due to the significant amount of planned and newly constructed residential developments that have occurred in these corridors over the last two to three years.

Table 4-4 Residential & Business Displacement Properties for Each Alternative

Type of Residence	Alternative					
	A5C1	**AAC2**	**D1**	**D13**	**D13 S**	**D13 N**
Residences	461	469	20	10	10	8
Businesses	5	2	6	3	1	3
R/W Cost estimate (year 2006 $)	$72.7 million	$46.4 million	$29.4 million	$31.7 million	$31.7 million	$36.0 million*

*Since the selection of the LEDPA, D13 North Modified, a Final Relocation Impact Report has been prepared for only this alternative. The approximate cost of right-of-way is currently estimated at $60 million. Table 4-4 shows the right of way costs at a comparable level of design. Refining design for the D 13 North Modified has resulted in an increase in right of way costs. Since the other alternatives have not been designed to the degree that the D13 North Modified has, it is no longer appropriate to compare right of ways costs.

Although Lincoln's future planned developments expect to add approximately 16,000 additional housing units, the Draft Relocation Impact Report states that the A5C1 and AAC2 alternatives will impact the City of Lincoln's housing stock and may be disruptive to the City's General Plan.

The Department's Relocation Assistance Program, required by Federal and state law, provides each displaced resident with help in finding replacement housing. There are eight residences and three businesses requiring relocation. Of the eight residences, four are single-family residences and four are mobile homes. Payments would include moving expenses and payments to enable displaced residents to obtain comparable decent, safe, and sanitary housing within their financial means. No residential occupant will be displaced unless replacement housing is available. If the mobile homes cannot be relocated at the time of displacement, due to age and condition, the occupants may be eligible for assistance in purchasing either a new mobile home or a conventional single-family residence. With respect to those residential properties involving a partial acquisition, owners of property appraised as having an uneconomic remnant may request relocation assistance. Adequate housing stock is expected to be available for those requiring relocation.

The relocations will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and Title VI of the Civil Rights Act of 1964. Title VI prohibits discrimination based on race, color, religion, sex, disabilities, age and national origin in providing services and benefits on Federally assisted projects. The Department's Relocation Assistance Advisory Service can be found in Appendix G.

Both businesses affected by the proposed project are expected to find suitable replacement locations. Business displacement problems can be minimized by way of the Department's' early purchase of business properties and leaseback arrangements. This would allow time for business property relocation and any construction needed while existing facilities are kept in operation. Displaced businesses are eligible for relocation

assistance including payment for moving and possible other expenses. Displaced businesses that are unable to relocate, or are expected to suffer a substantial loss of existing patronage, could be eligible for up to $20,000 "in lieu" payment through the Relocation Assistance Program.

4.1.5 Housing Impacts

The area located along the south side of Nicolaus Road, just west of Joiner Parkway is developing as residential and public (school and community center) uses. This development is adjacent to the location where the A5C1 and AAC2 alignments intersect Nicolaus Road and a possible future interchange may be constructed.

The large amount of displacements from the A5C1, and AAC2 alternatives would impact the City of Lincoln's housing stock, impact the newly built communities and may be disruptive to the City of Lincoln's general plan. The additional impacts to housing from the "AC" alternatives would have also increased the right-of-way costs considerably. The D1 and D13 alternatives are anticipated to have no negative impact on the Lincoln community. All relocations associated with this project would be subject to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended 1987.

4.1.6 Community Facilities and Services Impacts

Each of the alternatives analyzed, except the "No Build" alternative, would not reduce the accessibility to public services in the Study Area. All the proposed alternatives would reduce response times for emergency vehicles due to the improved circulation expected. All of the alignments would also remove the obstacle of the at-grade railroad crossing at Sheridan. The "No Build" alternative would increase response time due to congestion.

4.1.7 Traffic Impacts

Traffic congestion would be alleviated within the Lincoln city limits by removing inter-regional travelers.

4.1.8 Economic Impacts

Regional Economic Impacts

The estimated tax revenue lost to local government resulting from the right-of-way purchase of the ultimate alternative chosen, including the removal of residences and businesses from the tax base, is expected to be negligible. Revenue losses would be partially offset by the decrease in costs to the city and county associated with providing services to residential properties. In addition, past studies indicate most property values

may increase in those areas near the new facility because of increased access. This will net the city and county additional property tax revenue when the properties resale.

Project construction dollars would generate jobs and income over a two to three year construction period. In the 1980's, FHWA determined that a $1 million investment would directly generate ten on-site, full-time construction jobs. When other jobs are considered as part of the formula, such as off-site, construction related or service industry related jobs, the total number of jobs created amount to approximately 23 for each $1 million investment. It has not been determined how these numbers would translate considering the current economic climate; however, these figures are not expected to change significantly.

Impacts on Local Businesses and Industry

The existing commercial shopping and services area in Lincoln and Sheridan are generally located on and adjacent to SR 65. Some businesses in the Lincoln community have expressed concern that the construction of the Bypass may result in the decline of patronage.

It is difficult to predict the economic impacts of a bypass on businesses that are normally located on the main thoroughfare due to the number of variables affecting the local economy. Some businesses that may be negatively affected by the Bypass include motels, cafés, fast-food restaurants, and gas stations since much of their services are provided to pass through motorists. Although there are several commercial businesses that serve the motoring public, a large segment of the business activity in the downtown Lincoln area cater to local residents. In fact, the rerouting of traffic may result in an increase in sales and income to some businesses as the community members find it more convenient to shop downtown because pedestrian safety is enhanced and more parking is available for local residents.

Since the Bypass is predicated on future development, the downtown business climate should improve due to the increase in the local population growth. Furthermore, the Lincoln Redevelopment Agency has been promoting the concept of developing the downtown business district as "Old Towne." Lincoln's long-range effort to attract tourists and local residents to shop in the central business district is to capitalize on the historic fabric of the area.

The Bypass is likely to enhance the access to and availability of regional commercial centers existing or planned in Roseville. However, the ten-mile distance from Lincoln is currently not a major obstacle. Furthermore, the businesses that local residents would most likely seek in Roseville are generally not available in Lincoln.

Land Use Impacts

After the completion and approval of the environmental document, the CTC will select and adopt a corridor alignment to be reserved for the ultimate construction of the Lincoln Bypass. The Placer County General Plan, the City of Lincoln General Plan and the Sheridan General Plan will be revised, as necessary, to reflect the corridor alignment.

Economic Impacts

Economic impacts to the local economy with the construction of any of the alternatives are minimal. Although a few businesses may experience short-term impacts due to the Lincoln Bypass, long-term impacts are not expected. Furthermore, with the large amount of commercial development anticipated for the area, businesses will have the opportunity to relocate near the new alignment.

4.2 BICYCLE AND PEDESTRIAN IMPACTS

No negative impacts to bicyclists are anticipated with this proposed project. There are no accommodations for bicycles on the Lincoln Bypass; however, the existing SR 65 will remain as a bicycle route.

The diversion of "through" traffic from the downtown business district will likely promote pedestrian circulation from nearby residential areas. The proposed project will have crosswalks and push buttons at all signalized intersections and all pedestrian crossings will be ADA compliant. The Ferrari Ranch undercrossing, to be approved and constructed by the city, and the future interchange will provide a full pedestrian facility. On some portions of Industrial Avenue, sidewalks and ADA compliant ramps are included.

4.3 GEOGRAPHY AND TOPOGRAPHY

None of the proposed alternatives will substantially change the topography within the project area. The proposed bypass will be designed to provide for an all-weather route to ensure safe passage of emergency vehicles and serve as an emergency evacuation route. The minimum roadway profile grade elevation will be 1.43 meters (4.7 ft) above the existing ground elevation. This profile grade will ensure that the proposed bypass will be above potential floodwaters and provide coverage for future drainage features. The drainage features will maintain the existing hydrology of the area to the greatest extent possible.

The soils in the area present no particular problems with construction. The project will be designed to withstand seismic activity that could be expected in the area.

Reclamation of Minerals

A large amount of fill will be required for this project. Locating the fill will be the responsibility of the contractor. Reclaiming minerals from the fill will also be the responsibility of the contractor.

4.4 AIR QUALITY

This section evaluates air quality impacts that could result from the implementation of the proposed project. Air pollutant emissions associated with the construction of the project, such as fugitive dust from grading/site preparation and equipment exhaust could occur over the short-term during construction. Long-term emissions could result from the use of the proposed highway/freeway, primarily from vehicular traffic. The proposed project is not expected to generate additional traffic. Traffic would be rerouted from other area roadways to the proposed SR 65. Regional traffic trips would remain similar. Therefore, no new long-term regional emissions would result from implementation of the proposed project.

The proposed bypass route will improve traffic movement in the general vicinity, thereby lowering the concentration of pollutants emitted by motor vehicles. Consequently, no significant regional or local air quality impacts are anticipated. The following sections discuss the possible emission generating activities associated with the proposed project and their significance.

4.4.1 Naturally Occurring Asbestos

Naturally occurring asbestos (NOA) can be found in serpentinite and asbestos bearing ultramafic rocks, and can be released when that rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. Placer County is on the Office of Planning and Research's list of counties that have been identified as being particularly abundant with these types of rocks. However, the predominant rock type in the project location is from the Mehrten Formation that does not contain asbestos. The California Department of Mining and Geology (CDMG) Map (Open File Report 2000-19, August 2000) shows no areas of NOA.

Asbestos has also been used in the construction of older buildings and highway structures. Demolition of these older structures could cause asbestos contamination. Comprehensive inspections that meet the requirements of current EPA and OSHA regulations are recommended before any demolition activities associated with structures in the proposed alignment corridor. Any component that will be impacted by demolition activities should be characterized to ensure proper handling and disposal.

4.4.2 Long-term Microscale Projections

Each build alternative has its own layout and configuration; therefore, the air pollutant emissions level will be different for each alternative and thus are analyzed separately. In order to make a comparison, the same receptor locations are used throughout all alternatives and the results are compared to determine the difference in impact. Receptor locations are illustrated in Figure 3-12, located in Chapter 3. Receptor locations were determined by locating the nearest residents to each proposed alignment. In the case of planned development, receptors were estimated using maps provided by the City of Lincoln.

Carbon Monoxide (CO)

Local CO emissions level was assessed with the California Air Resources Board (CARB) approved CALINE4 air quality model, which allows microscale CO concentrations to be estimated along roadway corridors or near intersections. This model is designed to identify localized concentrations of CO, often termed "hot spots." The highest CO concentrations typically occur during peak traffic hours and volume, which represents a worst-case scenario for the calculation of CO emissions. Traffic volumes generated by the Departments' traffic analysis report for all the alternatives for the years 2015 and 2025 were used in the model (Caltrans, December 1999).

CO concentrations were calculated for the one-hour averaging period and compared to the State one hour CO standard of 20 ppm. CO eight-hour averages were calculated from the one-hour CO calculations, using techniques outlined in the Department's Carbon Monoxide Protocol. A persistent factor of 0.7 was used for the conversion of one-hour CO level to the eight-hour CO level. Concentrations are expressed as parts per million (ppm) at each receptor location.

Data in Table 4-5 illustrates the different impact levels of carbon monoxide (CO) concentration in the general vicinity of the project for the year 2015 and 2025, respectively. No significant impact on local air quality is expected from the proposed project in the years 2015 or 2025. The increases in CO concentrations are equal to or less than 0.1 ppm (particle per million) for both the one-hour and the eight-hour occurrences, which is considered minor and negligible. In addition, the CO concentrations are below the State and Federal standards, and no CO hot spots were identified. No nearby sensitive receptors would be affected by project related local air quality impacts. Therefore, implementation of the project would not have a negative impact on local air quality in the years 2015 and 2025.

Table 4-5 CO Concentration for 2015 and 2025

Receptor	1 Hour CO Concentration[1] (ppm)	8 Hour CO Concentration[2] (ppm)	Exceeds State Standards 1 hr	8 hr	Receptor	1 Hour CO Concentration[1] (ppm)	8 Hour CO Concentration[2] (ppm)	Exceeds State Standards 1 hr	8 hr
A5C1 (2015)									
REC1	4.2	2.4	No	No	**REC14**	**4.2**	2.4	No	No
REC2	4.2	2.4	No	No	**REC15**	**4.2**	2.4	No	No
REC3	4.2	2.4	No	No	**REC16A**	**4.3**	2.5	No	No
REC4	4.2	2.4	No	No	**REC16B**	**4.2**	2.4	No	No
REC5	4.2	2.4	No	No	**REC17**	**4.2**	2.4	No	No
REC6	4.2	2.4	No	No	**REC18**	**4.2**	2.4	No	No
REC7	4.2	2.4	No	No	**REC19**	**4.2**	2.4	No	No
REC8	4.2	2.4	No	No	**REC20**	**4.2**	2.4	No	No
REC9	4.2	2.4	No	No	**REC21**	**4.2**	2.4	No	No
REC10A	4.2	2.4	No	No	**REC22**	**4.2**	2.4	No	No
REC10B	4.2	2.4	No	No	**REC23**	**4.2**	2.4	No	No
REC13	4.2	2.4	No	No	**REC24**	**4.2**	2.4	No	No
					REC25	**4.2**	2.4	No	No
AAC2 (2015)									
REC1	4.2	2.4	No	No	**REC15**	4.2	2.4	No	No
REC2	4.2	2.4	No	No	**REC16A**	4.2	2.4	No	No
REC3	4.2	2.4	No	No	**REC16B**	4.2	2.4	No	No
REC4	4.2	2.4	No	No	**REC17**	4.2	2.4	No	No
REC5	4.2	2.4	No	No	**REC18**	4.2	2.4	No	No
REC6	4.2	2.4	No	No	**REC19**	4.3	2.5	No	No
REC7	4.2	2.4	No	No	**REC20**	4.2	2.4	No	No
REC8	4.2	2.4	No	No	**REC21**	4.2	2.4	No	No
REC9	4.2	2.4	No	No	**REC22**	4.2	2.4	No	No
REC10A	4.2	2.4	No	No	**REC23**	4.2	2.4	No	No
REC10B	4.2	2.4	No	No	**REC24**	4.2	2.4	No	No
REC13	4.2	2.4	No	No	**REC25**	4.2	2.4	No	No
REC14	4.2	2.4	No	No					
D1 – 2015									
REC1	4.2	2.4	No	No	**REC12**	4.2	2.4	No	No
REC2	4.2	2.4	No	No	**REC13**	4.2	2.4	No	No
REC3	4.2	2.4	No	No	**REC14**	4.2	2.4	No	No
REC4	4.2	2.4	No	No	**REC15**	4.2	2.4	No	No
REC5	4.2	2.4	No	No	**REC17**	4.2	2.4	No	No
REC6	4.2	2.4	No	No	**REC18**	4.2	2.4	No	No
REC7	4.2	2.4	No	No	**REC19**	4.2	2.4	No	No
REC9	4.2	2.4	No	No	**REC20**	4.2	2.4	No	No
REC10B	4.2	2.4	No	No	**REC21**	4.3	2.5	No	No
REC11	4.2	2.4	No	No					
D13 – 2015									
REC1	4.2	2.4	No	No	**REC12**	4.2	2.4	No	No
REC2	4.2	2.4	No	No	**REC13**	4.2	2.4	No	No

Receptor	1 Hour CO Concentration[1] (ppm)	8 Hour CO Concentration[2] (ppm)	Exceeds State Standards 1 hr	8 hr	Receptor	1 Hour CO Concentration[1] (ppm)	8 Hour CO Concentration[2] (ppm)	Exceeds State Standards 1 hr	8 hr
REC3	4.2	2.4	No	No	**REC14**	4.2	2.4	No	No
REC4	4.2	2.4	No	No	**REC15**	4.2	2.4	No	No
REC5	4.2	2.4	No	No	**REC17**	4.2	2.4	No	No
REC6	4.2	2.4	No	No	**REC18**	4.2	2.4	No	No
REC7	4.2	2.4	No	No	**REC19**	4.2	2.4	No	No
REC9	4.2	2.4	No	No	**REC20**	4.2	2.4	No	No
REC11	4.2	2.4	No	No	**REC21**	4.2	2.4	No	No
A5C1 – 2025									
REC1	4.2	2.4	No	No	**REC15**	4.2	2.4	No	No
REC2	4.2	2.4	No	No	**REC16A**	4.3	2.5	No	No
REC3	4.2	2.4	No	No	**REC16B**	4.3	2.5	No	No
REC4	4.2	2.4	No	No	**REC17**	4.2	2.4	No	No
REC5	4.2	2.4	No	No	**REC18**	4.2	2.4	No	No
REC6	4.2	2.4	No	No	**REC19**	4.2	2.4	No	No
REC7	4.2	2.4	No	No	**REC20**	4.2	2.4	No	No
REC8	4.2	2.4	No	No	**REC21**	4.2	2.4	No	No
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REC10A	4.2	2.4	No	No	**REC23**	4.2	2.4	No	No
REC10B	4.2	2.4	No	No	**REC24**	4.2	2.4	No	No
REC13	4.2	2.4	No	No	**REC25**	4.2	2.4	No	No
REC14	4.2	2.4	No	No					
A5C1 – 2025									
REC1	4.2	2.4	No	No	**REC15**	4.2	2.4	No	No
REC2	4.2	2.4	No	No	**REC16A**	4.2	2.4	No	No
REC3	4.2	2.4	No	No	**REC16B**	4.2	2.4	No	No
REC4	4.2	2.4	No	No	**REC17**	4.2	2.4	No	No
REC5	4.2	2.4	No	No	**REC18**	4.2	2.4	No	No
REC6	4.2	2.4	No	No	**REC19**	4.3	2.5	No	No
REC7	4.2	2.4	No	No	**REC20**	4.2	2.4	No	No
REC8	4.2	2.4	No	No	**REC21**	4.2	2.4	No	No
REC9	4.2	2.4	No	No	**REC22**	4.2	2.4	No	No
REC10A	4.2	2.4	No	No	**REC23**	4.2	2.4	No	No
REC10B	4.2	2.4	No	No	**REC24**	4.2	2.4	No	No
REC13	4.2	2.4	No	No	**REC25**	4.2	2.4	No	No
REC14	4.2	2.4	No	No					
D1 – 2025									
REC1	4.2	2.4	No	No	**REC11**	4.2	2.4	No	No
REC2	4.2	2.4	No	No	**REC12**	4.2	2.4	No	No
REC3	4.2	2.4	No	No	**REC13**	4.2	2.4	No	No
REC4	4.2	2.4	No	No	**REC14**	4.2	2.4	No	No
REC5	4.2	2.4	No	No	**REC15**	4.2	2.4	No	No
REC6	4.2	2.4	No	No	**REC17**	4.2	2.4	No	No
REC7	4.2	2.4	No	No	**REC18**	4.2	2.4	No	No

Receptor	1 Hour CO Concentration[1] (ppm)	8 Hour CO Concentration[2] (ppm)	Exceeds State Standards 1 hr	8 hr	Receptor	1 Hour CO Concentration[1] (ppm)	8 Hour CO Concentration[2] (ppm)	Exceeds State Standards 1 hr	8 hr
REC9	4.2	2.4	No	No	**REC19**	4.2	2.4	No	No
REC10B	4.2	2.4	No	No	**REC20**	4.2	2.4	No	No
					REC21	4.3	2.5	No	No
D13 – 2025									
REC1	4.2	2.4	No	No	**REC12**	4.2	2.4	No	No
REC2	4.2	2.4	No	No	**REC13**	4.2	2.4	No	No
REC3	4.2	2.4	No	No	**REC14**	4.2	2.4	No	No
REC4	4.2	2.4	No	No	**REC15**	4.2	2.4	No	No
REC5	4.2	2.4	No	No	**REC17**	4.2	2.4	No	No
REC6	4.2	2.4	No	No	**REC18**	4.2	2.4	No	No
REC7	4.2	2.4	No	No	**REC19**	4.2	2.4	No	No
REC9	4.2	2.4	No	No	**REC20**	4.2	2.4	No	No
REC11	4.2	2.4	No	No	**REC21**	4.2	2.4	No	No

[1] Includes ambient one hour CO concentration of 4.2 ppm. The State's one hour CO standard is 20 ppm.
[2] Includes ambient eight hour CO concentration of 2.4 ppm. The State's eight hour CO standard is 9.0 ppm.

As shown in Table 4-5, none of the alternatives will have a substantial impact on local air quality. The project would alleviate local congestion and have beneficial regional effects. Therefore, in accordance with the CEQA, this project is not considered to have a substantial impact on existing ambient air quality.

Air Quality Conformity Determination

The proposed project is partially funded and is programmed in the SACOG Metropolitan Transportation Plan (MTP) 2027 which was found to conform by the SACOG Board on March 16, 2006, and FHWA and FTA adopted the air quality conformity finding on April 20, 2006. The project is also included in the SACOG's financially constrained 2004-2006 MTIP, which was found to conform by FHWA and FTA on April 20, 2006. This proposed project's preferred alternative design, concept and scope are consistent with the above-mentioned documents, the 2004 STIP, and the proposed 2006 STIP. A local air quality analysis (Carbon Monoxide) has been performed.

In order for the project to be included in the MTIP, it must be in conformance with air quality standards and must meet certain criteria. This project has been analyzed and will not significantly change the air quality in the City of Lincoln.

The SIP was adopted in 1994 in compliance with the 1990 Amendments to the Federal Clean Air Act. At that time, our region could not show that we would meet the federal 1-hour standard by 1999. In exchange for moving the deadline to 2005, the

region accepted a designation of "severe non-attainment," with additional emission requirements on stationary sources.

In July 1997, EPA promulgated a new 8-hour standard for ozone. This change would lower the standard for ambient ozone from 0.12 parts per million of ozone averaged over one hour to 0.08 parts per million of ozone averaged over eight hours. In general, the 8-hour standard is more protective of public health and more stringent than the federal 1-hour standard. Key aspects of the 8-hour ozone rule are the new designations and non-attainment classifications in June 2004, and the revocation of the 1-hour ozone standard in June 2005. However, 8-hour ozone non-attainment areas remain subject to control measure commitments that applied under the 1-hour ozone standard. The Sacramento region has been designated as a non-attainment area for the federal 8-hour ozone standard with an attainment deadline of June 2013. As required by a court settlement, US EPA issued final non-attainment Area Designations for 8-hour ozone on April 15, 2004 for the 8-hour ozone standard.

Air quality models are used to demonstrate that the project's emissions will not contribute to the deterioration or impede the progress of air quality goals stated in the AQAP. The SACOG Regional Air Quality Model uses project specific data to estimate the amount of pollutants generated from the implementation of a project. The results for the "No build" and "Build" scenarios in the horizon year (2025) are compared to the AQAP air quality projections. If the analysis shows compliance with the requirements, it is considered consistent with the AQAP.

The proposed project is partially funded and is programmed in the SACOG Metropolitan Transportation Plan (MTP) 2027 which was found to conform by the SACOG Board on March 16, 2006, and FHWA and FTA adopted the air quality conformity finding on April 20, 2006. The project is also included in the SACOG's financially constrained 2004-2006 MTIP, which was found to conform by FHWA and FTA on April 20, 2006. This proposed project's preferred alternative design, concept and scope are consistent with the above-mentioned documents, the 2004 STIP, and the proposed 2006 STIP. A local air quality analysis (Carbon Monoxide) has been performed.

This project is in accordance with the goals and policies of the City's General Plan that is to provide for the long-range planning and development of the County's roadway system in order to ensure the safe and efficient movement of people and goods. The alternatives proposed are necessary for the safety of the public in the City of Lincoln and would accommodate future planned growth that is projected in the general vicinity. As shown in Table 4-5, the proposed project will not substantially contribute to or cause deterioration of existing air quality; therefore, mitigation measures are not required for

the long-term operation of the project. Hence, the proposed project is considered to be consistent with the City of Lincoln General Plan and the Placer County General Plan, and therefore consistent with the AQAP and in conformity with the State Implementation Plan (STIP).

Short-Term Construction Related Impacts

Construction Equipment Exhaust Emissions

Construction activities produce combustion emissions from various sources such as site grading, utility engines, on-site heavy-duty construction vehicles, equipment hauling materials to and from the site and vehicles transporting the construction crew. The use of construction equipment on site would result in localized exhaust emissions. On site exhaust emissions during construction would vary daily, as construction activity levels change. The Department's standard specifications for construction would be adhered to in order to reduce construction related emissions, thereby reducing impacts to less than significant under CEQA.

Avoidance and Minimization Measures

Construction Impacts

The following measures are provided to reduce air pollutants generated by vehicle and equipment exhaust during the project construction phase:

- The contractor shall ensure that grading plans include a statement that all construction equipment will be tuned and maintained in accordance with the manufacturer's specifications.
- The contractor shall utilize electric powered equipment in lieu of gasoline-powered engines where feasible.
- The contractor shall ensure that grading plans include a statement that work crews will shut off equipment when not in use.
- The contractor shall time the construction activities so as not to interfere with peak hour traffic and minimize obstruction of through traffic lanes adjacent to the site. If necessary, a flag person shall be retained to maintain safety adjacent to existing roadways.
- The contractor shall support and encourage ridesharing and transit incentives for the construction crew.

The following measure would reduce or minimize air pollutant emissions associated with asphalt paving:

- The construction contractor shall adhere to the requirements of the rules addressing the emission control measures covering the asphalt paving emissions.

In addition to the recommended avoidance and minimization measures listed above, the Department's' Standard Construction Specifications shall be adhered to further reduce emissions. Following is a list of avoidance and minimization measures to reduce the emission of fugitive dust.

- All disturbed areas, including storage piles, that are not being actively utilized for construction purposes shall be effectively stabilized for dust emissions using water, chemical stabilizers/suppressants, or vegetative ground cover.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized for dust emissions using water or chemical stabilizers/ suppressants.
- All land clearing, grubbing, scraping, excavations, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled for fugitive dust emissions utilizing applications of water, or by presoaking.
- When materials are transported off site, all material shall be covered or effectively wetted to limit visible dust emission; or at least six inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring. The use of dry rotary brushes is expressly prohibited, except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. The use of blower devices is expressly forbidden.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized for fugitive dust emissions utilizing sufficient water or chemical stabilizers/suppressants.
- Traffic speeds on unpaved roads shall be limited to 15 mph.
- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.
- Wheel washers for all exiting trucks shall be installed, or all trucks and equipment washed off before leaving the site.
- Windbreaks shall be installed at windward side(s) of construction areas.
- Excavation and grading activity shall be suspended when winds exceed 20 mph.

- Areas subject to excavation, grading and other construction activity shall be limited at any one time.

Compliance with the above minimization measures would lessen the fugitive dust impact during construction.

4.5 NOISE IMPACTS

Federal guidelines for assessing traffic noise are contained in Title 23 of the Code of Federal Regulations Part 772, (23 CFR 772), "Procedures for Abatement of Highway Traffic Noise and Construction Noise." These guidelines require consideration of noise abatement measures for highway projects when traffic related noise impacts have been identified. The Federal and State guidelines state that there will be a noise impact when design year noise levels approach or exceed the noise abatement criterion (NAC) (coming within one dBA of the NAC) for the specified land use, or when the predicted traffic noise levels substantially exceed, by 12 dBA or more, the existing noise levels.

The land use in the Noise Impacts Study Area is primarily rural/agricultural. At present there are scattered residences along all the alignments, however, development has been completed and planned for much of the area southeast of the airport. All of the identified receptors are considered Activity Category B (NAC of 66 dBA) or C (NAC of 72 dBA).

The ultimate design year is 2025 and is considered in the traffic noise model. Four alignments, AAC2, A5C1, D1 and D13, were modeled using Sound32. Of the 31 receptor locations, eight receptors represent undeveloped lands for which development is underway or has been planned, designed and programmed prior to the date of public knowledge of the planned project. When traffic noise impacts are predicted for undeveloped lands for which development is planned, designed and programmed before the date of public knowledge, noise abatement must be considered as part of the project. (See Figure 3-12, Noise and Air Receptors.)

Noise impacts from the D13 South Modified have not been quantitatively analyzed because all of the existing and future planned housing developments, represented by receptors NR-15, NR-21, NR-27 and NR-28, are located north of the D13 alignments. As D13 South Modified is south of D13, future noise levels in these vicinities are predicted to be less than D13. It is therefore assumed that traffic noise impacts and any proposed abatement measures for D13 South Modified to be equivalent to the D13.

The D13 North Modified traverses land uses that are principally rural and undeveloped. North of Coon Creek, the A5C1, AAC2, D1, D13, and D13 South Modified Alternatives traverse identical land uses and parallel the D13 North Modified.

The closest residences are represented by NR2. The D1 alignment is considered equal or closer than noise receptors in the D13 North Modified alignment and hence considered worst case. As a result, the analysis and subsequent impacts/abatement measures, if any, are considered identical to those that were modeled in the noise analysis.

For specific details on the noise impact evaluation, please refer to the Noise Impact Report, available for review at the Department of Transportation, District 3, Sacramento Office, 2389 Gateway Oaks Dr., Sacramento, CA

4.5.1 Long Term Noise Impacts

Table 4-6 shows the existing noise levels at the 31 receptors within the Study Area and the predicted noise levels, without sound walls, for each of the alignments. Noise levels were predicted for 2025. Bold numbers indicate approach or exceed Noise Abatement Criteria (NAC) at impacted receptors. Italic numbers indicate a "substantial increase" over existing levels.

Table 4-6 Projected Traffic Noise Levels – Ultimate Plan 2025

Noise Level Location	Existing Noise (Monitored) Leq dBA	A5C1	AAC2	D1	D13
NR-1	49.1	60.6	60.5	56.8	56.8
NR-2	45.6	*60.6*	*62.6*	57.3	57.3
NR-3	54	55.2	55.2	52.9	55.0
NR-4	45.6	53.4	55.5	*60.5*	*60.5*
NR-5	51.3	57.8	*64.6*	63.1	63.1
NR-6	49.6	50.3	50.7	56.6	56.6
NR-7	38.1	*58.2*	*51.2*	*55.2*	*57.6*
NR-8	48.1	62.0	59.1	N/A	N/A
NR-9	36.4	*53.0*	*52.4*	N/A	N/A
NR-10a	54.4	64.3	63.6	N/A	N/A
NR-10b	52.7	63.8	63.2	N/A	N/A
NR-11	36.6	N/A	N/A	*54.7*	*51.6*
NR-12	46	N/A	N/A	*60.5*	56.2
NR-13	43.3	N/A	N/A	***68.2***	*57.9*
NR-14	43.4	N/A	53.0	***68.6***	*60.1*
NR-15	45.6	*62.4*	*60.5*	N/A	53.1
NR-16a	47.7	***65.9***	*60.7*	N/A	N/A
NR-16b	47.9	***66.2***	*60.1*	N/A	N/A
NR-17[4] (8)	48.1	59.6	*61.3*	58.6	58.1
NR-18[4] (10a)	54.4	***70.4***	***70.0***	***65.7***	***69.5***
NR-19[4] (10a)	54.4	***66.6***	***65.9***	***73.7***	***68.0***
NR-20[4] (14)	43.4	***70.4***	***70.3***	*59.1*	*63.2*
NR-21[4] (15)	45.6	***73.9***	***69.6***	57.0	55.6
NR-22[4] (16b)	47.9	***72.5***	***66.4***	N/A	N/A
NR-23[4] (10b)	52.7	***72.2***	*65.2*	N/A	N/A

Noise Level Location	Existing Noise (Monitored) Leq dBA	A5C1	AAC2	D1	D13
NR-24[4] (8)	48.1	*65.0*	*63.0*	N/A	N/A
NR-25[4] (6)	49.6	*63.4*	*62.2*	N/A	N/A
NR-264 (14)	43.4	70.4	70.3	59.1	63.2
NR-27[4] (14)	43.4	N/A	N/A	*60.2*	***73.6***
NR-28[4] (14)	43.4	N/A	N/A	*59.7*	***65.9***
NR-29[4] (14)	43.4	***71.0***	***69.6***	***67.9***	***65.8***
NR-30[4] (14)	43.4	***70.7***	***68.7***	***69.1***	***67.8***
NR-31[4] (15)	45.6	***68.6***	***64.6***	N/A	N/A

[1] N/A- The modeled segment does not contribute significantly to the noise level at the considered receptor location. Receptor location not modeled for the considered alignment.
[2] Italic numbers indicate "substantial increase" over existing levels.
[3] Bold numbers indicate noise levels that "approach or exceed" the NAC at impacted receptor.
[4] An "acoustical equivalent" was used as indicated in parenthesis.

Table 4-7 Summary of Traffic Noise Modeling Results (A5C1)

Receiver ID	Location Description	Type of Development	Noise Abatement Category Leq (h)	Existing Measured Noise Level dBA Leq (h)	Predicted[4] Worst Noise Hour Noise Level dBA Leq (h)	Noise Increase (+) or Decrease (-)	Impact Type[5]
NR-1	4221 North Dowd Road	Res.	B [1]	49.1	60.6[2] [3]	+11.5	None
NR-2	100m north of Riosa Road	Res.	B[1]	45.6	60.6 [3]	+15.0	S
NR-3	100 feet from Existing SR 65	Res.	B[1]	54	55.2 [3]	+1.2	None
NR-4	4710 North Dowd Road	Res.	B[1]	45.6	53.4 [3]	+7.8	S
NR-5	4221 North Dowd Road	Res.	B[1]	51.3	57.8 [3]	+6.5	None
NR-6	700 feet from Existing SR 65	Res.	B[1]	49.6	50.3 [3]	+0.7	None
NR-7	2780 Dowd Road	Res.	B[1]	38.1	68.2 [3]	+30.1	S, A/E
NR-8	2000 feet from Existing SR 65, 1000 feet from C1 and C2	Res.	B[1]	48.1	62.0 [3]	+13.9	S
NR-9	200m south of Wise Road	Res.	B[1]	36.4	53.0 [3]	+16.6	S
NR-10a	Along Wise Road	Res.	B[1]	54.4	64.3 [3]	+9.9	None
NR-10b	Along Wise Road	Res.	B[1]	52.7	63.8 [3]	+11.1	None
NR-11	Along Airport Road	Res.	B[1]	36.6	N/A	N/A	N/A
NR-12	Along Nicolaus Road	Res.	B[1]	46	N/A	N/A	N/A
NR-13	On Rockwell Lane	Res.	B[1]	43.3	N/A	N/A	N/A
NR-14	Along Moore Road	Res.	B[1]	43.4	N/A	N/A	S
NR-15	400 feet east of C1 and C2	Res.	B[1]	45.6	62.4 [3]	+16.8	S
NR-16a	North end of El Camino Verde	Res.	B[1]	47.7	65.9 [3]	+18.2	S, A/E
NR-16b	1245 Cobblestone Dr	Res.	B[1]	47.9	66.2 [3]	+18.3	S, A/E
NR - 17	2000 feet from SR 65	Res.	B[1]	48.1	59.6 [3]	+11.5	S
NR-18	Lincoln Crossing	Res.	B[1]	54.4	70.4 [3]	+16.0	S, A/E
NR-19	Lincoln Crossing	Comm/ Res.	C/B [1]	54.4	66.6 [3]	+12.2	S, A/E
NR-20	Lincoln Crossing	Res.	B [1]	43.4	70.4 [3]	+27.0	S, A/E

Receiver ID	Location Description	Type of Development	Noise Abate-ment Category Leq (h)	Existing Measured Noise Level dBA Leq (h)	Predicted[4] Worst Noise Hour Noise Level dBA Leq (h)	Noise Increase (+) or Decrease (-)	Impact Type[5]
NR-21	50 feet from Existing SR 65	Res.	B [1]	45.6	73.9 [3]	+28.3	S, A/E
NR-22	50 feet from Existing SR 65, south of Nicolaus Road	Res.	B [1]	47.9	72.5 [3]	+24.6	S, A/E
NR-23	50 feet south of Nicolaus Road	Res.	B [1]	52.7	72.2 [3]	+19.5	S, A/E
NR-24	50 feet from C1	Res.	B [1]	48.1	65.0 [3]	+16.9	S
NR-25	50 feet from Existing SR 65	Res.	B [1]	49.6	63.4 [3]	+13.8	S
NR-26	NW corner of SR 65/Ferrari Ranch	Res.	B [1]	43.4	70.4 [3]	27.0	S, A/E
NR-27	100 feet North of D13	Res.	B [1]	43.4	N/A	N/A	N/A
NR-28	100 feet North of D13	Res.	B [1]	43.4	N/A	N/A	N/a
NR-31	3-D Development	Res.	B [1]	43.4	71.0 [3]	27.6	S, A/E
NR-30	3-D Development	Res.	B [1]	43.4	70.7 [3]	+27.3	S, A/E
NR-31	Lincoln West Development	Res.	B [1]	45.6	68.6 [3]	+23.0	S, A/E

[1] 67 dB [2] 72 dB [3] Modeled [4] Predicted for design year 2025 [5] Impact Types:
None - no impacts identified, A/E - noise abatement criteria approached or exceeded, S - existing noise level substantially increased, N/A- Not Applicable

Table 4-8 Summary of Traffic Noise Modeling Results AAC2

Receiver ID	Location Description	Type of Development	Noise Abate-ment Category Leq (h)	Existing Measured Noise Level dBA Leq (h)	Predicted[4] Worst Noise Hour Noise Level dBA Leq (h)	Noise Increase (+) or Decrease (-)	Impact Type[6]
NR-1	6355 North SR 65	Res.	B[1]	49.1	60.5 [3]	+11.4	None
NR-2	100m north of Riosa Road	Res.	B[1]	45.6	62.6[3] [3]	+17.0	S
NR-3	100 feet from Existing SR 65	Res.	B[1]	54	55.2 [3]	+1.2	None
NR-4	4710 North Dowd Road	Res.	B[1]	45.6	55.5 [3]	+9.9	None
NR-5	4221 North Dowd Road	Res.	B[1]	51.3	64.6 [3]	+13.3	S
NR-6	700 feet from Existing SR 65	Res.	B[1]	49.6	50.7 [3]	+1.1	None
NR-7	2780 Dowd Road	Res.	B[1]	38.1	51.2 [3]	+13.1	S
NR-8	2000 feet from Existing SR 65, 1000 feet from C1 and C2	Res.	B[1]	48.1	59.1 [3]	+11.0	None
NR-9	200m south of Wise Road	Res.	B[1]	36.4	52.4 [3]	+16.0	S
NR-10a	Along Wise Road	Res.	B[1]	54.4	63.6 [3]	+9.2	None
NR-10b	Along Wise Road	Res.	B[1]	52.7	63.2 [3]	+10.5	None
NR-11	Along Airport Road	Res.	B[1]	36.6	N/A	N/A	N/A
NR-12	Along Nicolaus Road	Res.	B[1]	46	N/A	N/A	N/A
NR-13	On Rockwell Lane	Res.	B[1]	43.3	N/A	N/A	N/A
NR-14	Along Moore Road	Res.	B[1]	43.4	53.0 [3]	+9.6	None
NR-15	400 feet east of C1 and C2	Res.	B[1]	45.6	60.5 [3]	+14.9	S

Receiver ID	Location Description	Type of Development	Noise Abate-ment Category Leq (h)	Existing Measured Noise Level dBA Leq (h)	Predicted[4] Worst Noise Hour Noise Level dBA Leq (h)	Noise Increase (+) or Decrease (-)	Impact Type[6]
NR-16a	North end of El Camino Verde	Res.	B[1]	47.7	60.7 [3]	+13.0	S
NR-16b	1245 Cobblestone Dr	Res.	B[1]	47.9	60.1 [3]	+12.2	S
NR-17	2000 feet from SR 65	Res.	B[1]	48.1	61.3 [3]	+13.2	S
NR-18	Lincoln Crossing	Res.	B[1]	54.4	70.0 [3]	+15.6	S, A/E
NR-19	Lincoln Crossing	Comm/ Res.	C/B[1]	54.4	65.9 [3]	+11.5	S, A/E
NR-20	Lincoln Crossing	Res.	B[1]	43.4	70.3 [3]	+26.9	S, A/E
NR-21	50 feet from Existing SR 65	Res.	B[1]	45.6	69.6 [3]	+24.0	S, A/E
NR-22	50 feet from Existing SR 65, south of Nicolaus Road	Res.	B[1]	47.9	66.4 [3]	+18.5	S, A/E
NR-23	50 feet south of Nicolaus Road	Res.	B[1]	52.7	65.2 [3]	+12.5	S
NR-24	50 feet from C1	Res.	B[1]	48.1	63.0 [3]	+14.9	S
NR-25	50 feet from Existing SR 65	Res.	B[1]	49.6	62.2 [3]	+12.6	S
NR-26	NW corner of SR 65/Ferrari Ranch	Res.	B[1]	43.4	70.3 [3]	26.9	S, A/E
NR-27	100 feet North of D13	Res.	B[1]	43.4	N/A	N/A	N/A
NR-28	100 feet North of D13	Res.	B[1]	43.4	N/A	N/A	N/A
NR-29	3-D Development	Res.	B[1]	43.4	69.6 [5]	+26.2	S, A/E
NR-30	3-D Development	Res.	B[1]	43.4	68.7 [5]	+25.3	S, A/E
NR-31	Lincoln West Development	Res.	B[1]	45.6	64.6 [5]	+19.0	S

[1] 67 dB [2] 72 dB [3] Modeled [4] Predicted for design year 2025 [5] Measured
[6]Impact Types: None - no impacts identified, A/E - noise abatement criteria approached or exceeded, S - existing noise level substantially increased, N/A- Not Applicable

Table 4-9 Summary of Traffic Noise Modeling Results D1

Receiver ID	Location Description	Type of Developme nt	Noise Abate-ment Category Leq (h)	Existing Measured Noise Level dBA Leq (h)	Predicted [4] Worst Noise Hour Noise Level dBA Leq (h)	Noise Increase (+) or Decrease (-)	Impact Type[5]
NR-1	6355 North SR 65	Res.	B[1]	49.1	56.8 [3]	+7.7	None
NR-2	100m north of Riosa Road	Res.	B[1]	45.6	57.3 [3]	+11.7	None
NR-3	100 feet from Existing SR 65	Res.	B[1]	54	52.9 [3]	0	None
NR-4	4710 North Dowd Road	Res.	B[1]	45.6	60.5 [3]	+14.9	S
NR-5	4221 North Dowd Road	Res.	B[1]	51.3	63.1 [3]	+11.8	None
NR-6	700 feet from Existing SR 65	Res.	B[1]	49.6	56.6 [3]	+7	None
NR-7	2780 Dowd Road	Res.	B[1]	38.1	55.2 [3]	+17.1	S
NR-8	2000 feet from Existing SR 65, 1000 feet from C1 and C2	Res.	B[1]	48.1	N/A	N/A	N/A
NR-9	200m south of Wise Road	Res.	B[1]	36.4	N/A	N/A	N/A
NR-10a	Along Wise Road	Res.	B[1]	54.4	N/A	N/A	N/A
NR-10b	Along Wise Road	Res.	B[1]	52.7	N/A	N/A	N/A

Receiver ID	Location Description	Type of Development	Noise Abate-ment Category Leq (h)	Existing Measured Noise Level dBA Leq (h)	Predicted [4] Worst Noise Hour Noise Level dBA Leq (h)	Noise Increase (+) or Decrease (-)	Impact Type[5]
NR-11	Along Airport Road	Res.	B[1]	36.6	54.7 [3]	+18.1	S
NR-12	Along Nicolaus Road	Res.	B[1]	46	60.5 [3]	+14.5	S
NR-13	On Rockwell Lane	Res.	B[1]	43.3	68.2 [3]	+24.9	S, A/E
NR-14	Along Moore Road	Res.	B[1]	43.4	68.6 [3]	+25.2	S, A/E
NR-15	400 feet east of C1 and C2	Res.	B[1]	45.6	N/A	N/A	N/A
NR-16a	North end of El Camino Verde	Res.	B[1]	47.7	N/A	N/A	N/A
NR-16b	1245 Cobblestone Dr	Res.	B[1]	47.9	N/A	N/A	N/A
NR-17	2000 feet from SR 65	Res.	B[1]	48.1	58.6 [3]	+10.5	None
NR-18	Lincoln Crossing	Res.	B[1]	54.4	65.7 [3]	+11.3	S, A/E
NR-19	Lincoln Crossing	Comm/ Res.	C/B1	54.4	73.7 3	+19.3	S, A/E
NR-20	Lincoln Crossing	Res.	B[1]	43.4	59.1 [3]	+15.7	S
NR-21	50 feet from Existing SR 65	Res.	B[1]	45.6	57.0 [3]	+11.4	S
NR-22	50 feet from Existing SR 65, south of Nicolaus Road	Res.	B[1]	47.9	N/A	N/A	N/A
NR-23	50 feet south of Nicolaus Road	Res.	B[1]	52.7	N/A	N/A	N/A
NR-24	50 feet from C1	Res.	B[1]	48.1	N/A	N/A	N/A
NR-25	50 feet from Existing SR 65	Res.	B[1]	49.6	N/A	N/A	N/A
NR-26	NW corner of SR 65/ Ferrari Ranch	Res.	B[1]	43.4	59.1 [3]	15.7	S
NR-27	100 feet North of D13	Res.	B[1]	43.4	60.2 [3]	+16.8	S
NR-28	100 feet North of D13	Res.	B[1]	43.4	59.7 [3]	+16.3	S
NR-29	3-D Development	Res.	B[1]	43.4	67.9 [3]	+24.5	S, A/E
NR-30	3-D Development	Res.	B[1]	43.4	69.1 [3]	+25.7	S, A/E
NR-31	Lincoln West Development	Res.	B[1]	45.6	N/A	N/A	N/A

[1] 67 dB [2] 72 dB [3] Modeled [4] Predicted for design year 2025 [5] Impact Types:
None - no impacts identified, A/E - noise abatement criteria approached or exceeded, S - existing noise level substantially increased, N/A- Not Applicable

Table 4-10 Summary of Traffic Noise Modeling Results D13

Receiver ID	Location Description	Type of Development	Noise Abate-ment Category Leq (h)	Existing Noise Level dBA Leq (h)	Predicted [4] Worst Noise Hour Noise Level dBA Leq (h)	Noise Increase (+) or Decrease (-)	Impact Type[5]
NR-1	6355 North SR 65	Res.	B[1]	49.1	56.8 [3]	+7.7	None
NR-2	100m north of Riosa Road	Res.	B[1]	45.6	57.3 [3]	+11.7	None
NR-3	100 feet from Existing SR 65	Res.	B[1]	54	55.0 [3]	+1.0	None
NR-4	4710 North Dowd Road	Res.	B[1]	45.6	60.5 [3]	+14.9	S
NR-5	4221 North Dowd Road	Res.	B[1]	51.3	63.1 [3]	+11.8	None
NR-6	700 feet from Existing SR 65	Res.	B[1]	49.6	56.6 [3]	+7.0	None
NR-7	2780 Dowd Road	Res.	B[1]	38.1	57.6 [3]	+19.5	S

Receiver ID	Location Description	Type of Development	Noise Abate-ment Category Leq (h)	Existing Noise Level dBA Leq (h)	Predicted [4] Worst Noise Hour Noise Level dBA Leq (h)	Noise Increase (+) or Decrease (-)	Impact Type[5]
NR-8	2000 feet from Existing SR 65, 1000 feet from C1 and C2	Res.	B[1]	48.1	N/A	N/A	N/A
NR-9	200m south of Wise Road	Res.	B[1]	36.4	N/A	N/A	N/A
NR-10a	Along Wise Road	Res.	B[1]	54.4	N/A	N/A	N/A
NR-10b	Along Wise Road	Res.	B[1]	52.7	N/A	N/A	N/A
NR-11	Along Airport Road	Res.	B[1]	36.6	51.6 [3]	+15	S
NR-12	Along Nicolaus Road	Res.	B[1]	46	56.2 [3]	+10.2	None
NR-13	On Rockwell Lane	Res.	B[1]	43.3	57.9 [3]	+14.6	S
NR-14	Along Moore Road	Res.	B[1]	43.4	60.1 [3]	+16.7	S
NR-15	400 feet east of C1 and C2	Res.	B[1]	45.6	53.1 [3]	+7.5	None
NR-16a	North end of El Camino Verde	Res.	B[1]	47.7	N/A	N/A	N/A
NR-16b	1245 Cobblestone Dr	Res.	B[1]	47.9	N/A	N/A	N/A
NR-17	2000 feet from SR 65	Res.	B[1]	48.1	58.1 [3]	+10	None
NR-18	Lincoln Crossing	Res.	B[1]	54.4	69.5 [3]	+15.1	S, A/E
NR-19	Lincoln Crossing	Comm./ Res.	C/B[1]	54.4	68.0 [3]	+13.6	S, A/E
NR-20	Lincoln Crossing	Res.	B[1]	43.4	63.2 [3]	+19.8	S
NR-21	50 feet from Existing SR 65	Res.	B[1]	45.6	55.6 [3]	+10	None
NR-22	50 feet from Existing SR 65, south of Nicolaus Road	Res.	B[1]	47.9	N/A	N/A	N/A
NR-23	50 feet south of Nicolaus Road	Res.	B[1]	52.7	N/A	N/A	N/A
NR-24	50 feet from C1 Alignment	Res.	B[1]	48.1	N/A	N/A	N/A
NR-25	50 feet from Existing SR 65	Res.	B[1]	49.6	N/A	N/A	N/A
NR-26	NW corner of SR 65/Ferrari Ranch	Res.	C[2]	43.4	63.2 [3]	19.8	S
NR-27	100 feet North of D13 Alignment	Res.	B[1]	43.4	73.6 [3]	+30.2	S, A/E
NR-28	100 feet North of D13	Res.	B[1]	43.4	65.9 [3]	+22.5	S, A/E
NR-29	3-D Development	Res.	B[1]	43.4	65.8 [3]	+22.4	S, A/E
NR-30	3-D Development	Res.	B[1]	43.4	67.8 [3]	+24.4	S, A/E
NR-31	Lincoln West Development	Res.	B[1]	45.6	N/A	N/A	N/A

[1] 67 dB [2] 72 dB [3] Modeled [4] Predicted for design year 2025
[5] Impact Types: None - no impacts identified, A/E - noise abatement criteria approached or exceeded, S - existing noise level substantially increased, N/A- Not Applicable

4.5.2 Noise Abatement Measures

Long Term noise impact abatement measures (NEPA)

Under Federal/FHWA regulations (23 CFR 772) and the Department's policy, noise abatement must be considered when the project results in a noise impact. Feasible and reasonable abatement measures must be included in the final environmental

documentation. Receptor locations that are predicted to be noise impacted are summarized in Table 4-7 through Table 4-10.

According to the Caltrans Noise Protocol, a minimum of 5 dB of noise reduction must be achieved at impacted receivers for proposed noise abatement to be considered feasible. Other factors may also restrict feasibility, including topography, access requirements for driveways or ramps, presence of local cross streets, other noise sources in the area, and safety considerations.

For any soundwalls to be considered reasonable from a cost perspective, the total estimated cost of the wall must be at or below the total allowance calculated for each wall. The reasonable base cost allowance per benefited residence is $17,000. The cost calculations of the soundwall should include all items appropriate and necessary for the construction of the soundwall, such as traffic control, drainage, and retaining walls. Soundwalls were not considered at isolated rural residences on large lots because they did not meet the Caltrans/FHWA reasonableness criteria. Soundwalls for rural and single family residences would not be reasonable from a cost perspective because the cost of the soundwall per residence is too high. No further evaluation was made at these locations. Noise abatement is not considered reasonable at commercial use sites, as soundwalls are generally not desired for these land use types. A final decision on sound walls, including the specific locations and heights, will be made by the Project Development Team (PDT) after final design has been completed, and local government and public input has been made. Table 4-11 through Table 4-14 discuss the soundwalls evaluated as noise abatement, including cost effectiveness.

Table 4-11 Soundwalls Evaluated for Abatement Alternative A5C1

Sound Wall	Recvr(s) Protected	SW Height	Length (ft)	SW Location Description	Total Reasonable Allowance	Engineers estimate
C1.1	19 (Comm.)	3.0 m (10 ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 163+00 to 185+00	NR	NR
		3.6 m (12 ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 163+00 to 185+00	NR	NR
		4.3 m (14 ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 163+00 to 185+00	NR	NR
		4.6 m (16 ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 163+00 to 185+00	NR	NR
C1.2	20,29 (3-D Dev.)	3.0 m (10 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR65 185+00 to 246+00	NF	NF
		3.6 m (12 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR65 185+00 to 246+00	NF	NF
		4.3 m (14 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR65 185+00 to 246+00	$1,591,000	$1,843,300

Sound Wall	Recvr(s) Protected	SW Height	Length (ft)	SW Location Description	Total Reasonable Allowance	Engineers estimate
		4.6 m (16 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR65 185+00 to 246+00	$1,677,000	$2,764,900
C1.3	30 (3-D Dev.	3.0 m (10 ft)	853 m (2,800 ft)	S/B SR65 246+00 to 218+00	$1,560,000	$604,400
		3.6 m (12 ft)	853 m (2,800 ft)	S/B SR65 246+00 to 218+00	$1,560,000	$725,200
		4.3 m (14 ft)	853 m (2,800 ft)	S/B SR65 246+00 to 218+00	$1,640,000	$846,100
		4.6 m (16 ft)	853 m (2,800 ft)	S/B SR65 246+00 to 218+00	$1,640,000	$1,269,100
C1.4	18	3.0 m (10 ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 185+00 to 163+00	$2,220,000	$474,900
		3.6 m (12 ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 185+00 to 163+00	$2,340,000	$569,800
		4.3 m (14 ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 185+00 to 163+00	$2,340,000	$664,800
		4.6 m (16 ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 185+00 to 163+00	$2,340,000	$997,200
C1.5	15,21	3.0 m (10 ft)	1097 m (3,600 ft)	N/B SR65 253+00 to 289+00	NF	NF
		3.6 m (12 ft)	1097 m (3,600 ft)	N/B SR65 253+00 to 289+00	$2,769,000	$932,400
		4.3 m (14 ft)	1097 m (3,600 ft)	N/B SR65 253+00 to 289+00	$2,769,000	$1,087,800
		4.6 m (16 ft)	1097 m (3,600 ft)	N/B SR65 253+00 to 289+00	$2,911,000	$1,631,700
C1.6	16a, 16b	3.0 m (10 ft)	1707 m (5,600 ft)	S/B SR65 to Nicolaus Off-Ramp 356+00 to 300+00	NF	NF
		3.6 m (12 ft)	1707 m (5,600 ft)	S/B SR65 to Nicolaus Off-Ramp 356+00 to 300+00	NF	NF
		4.3 m (14 ft)	1707 m (5,600 ft)	S/B SR65 to Nicolaus Off-Ramp 356+00 to 300+00	$1,184,000	$1,692,200
		4.6 m (16 ft)	1707 m (5,600 ft)	S/B SR65 to Nicolaus Off-Ramp 356+00 to 300+00	$1,184,000	$2,538,200
C1.7a[1]	22,23	3.0 m (10 ft)	396 m (1,300 ft)	Nicolaus to S/B SR65 300+00 to 287+00	NF	NF
		3.6 m (12 ft)	396 m (1,300 ft)	Nicolaus to S/B SR65 300+00 to 287+00	NF	NF
		4.3 m (14 ft)	396 m (1,300 ft)	Nicolaus to S/B SR65 300+00 to 287+00	$962,000	$392,900
		4.6 m (16 ft)	396 m (1,300 ft)	Nicolaus to S/B SR65 300+00 to 287+00	$962,000	$589,300
C1.7b[1]	31 (Lincoln West Dev.)	3.0 m (10 ft)	518 m (1,700 ft)	S/B SR65 275+00 to 258+00	$1,155,000	$367,000
		3.6 m (12 ft)	518 m (1,700 ft)	S/B SR65 275+00 to 258+00	$1,155,000	$440,300
		4.3 m (14 ft)	518 m (1,700 ft)	S/B SR65 275+00 to 258+00	$1,221,000	$513,700
		4.6 m (16 ft)	518 m (1,700 ft)	S/B SR65 275+00 to 258+00	$1,221,000	$770,600
C1.13	10a	3.0 m (10 ft)	304.8 m (1,000 ft)	E/B Wise Road	NF	NF
		3.6 m (12 ft)	304.8 m (1,000 ft)	E/B Wise Road	$66,000	$259,000
		4.3 m (14 ft)	304.8 m (1,000 ft)	E/B Wise Road	$66,000	$302,200
		4.6 m (16 ft)	304.8 m (1,000 ft)	E/B Wise Road	$66,000	$453,300
C1.14	10b	3.0 m (10 ft)			NF	NF
		3.6 m (12 ft)			NF	NF
		4.3 m (14 ft)			NF	NF
		4.6 m (16 ft)			NF	NF

Sound Wall	Recvr(s) Protected	SW Height	Length (ft)	SW Location Description	Total Reasonable Allowance	Engineers estimate
C1.11	7	3.0 m (10 ft)			NF	NF
		3.6 m (12 ft)			NF	NF
		4.3 m (14 ft)			NF	NF
C1.12	8	3.0 m (10 ft)			NF	NF
		3.6 m (12 ft)			NF	NF
		4.3 m (14 ft)			NF	NF
		4.6 m (16 ft)			NF	NF
C1.10	4,5	3.0 m (10 ft)	3444 m (11,300 ft)	N/B SR 65 532+00 to 645+00	$99,000	$111,000
		3.6 m (12 ft)	3444 m (11,300 ft)	N/B SR 65 532+00 to 645+00	$99,000	$2,926,700
		4.3 m (14 ft)	3444 m (11,300 ft)	N/B SR 65 532+00 to 645+00	$105,000	$3,414,500
		4.6 m (16 ft)	3444 m (11,300 ft)	N/B SR 65 532+00 to 645+00	$105,000	$5,121,800
C1.8	1	3.0 m (10 ft)			NF	NF
		3.6 m (12 ft)			NF	NF
		4.3 m (14 ft)			NF	NF
		4.6 m (16 ft)			NF	NF
C1.9	2	3.0 m (10 ft)	427 m (1,400 ft)	W/B Riosa N/B SR 65 532+00 to 645+00	NF	NF
		3.6 m (12 ft)	304.8 m (1,000 ft)	W/B Riosa N/B SR 65 532+00 to 645+00	NF	NF
		4.3 m (14 ft)	304.8 m (1,000 ft)	W/B Riosa N/B SR 65 532+00 to 645+00	NF	NF
		4.6 m (16 ft)	304.8 m (1,000 ft)	W/B Riosa N/B SR 65 532+00 to 645+00	NF	NF

[1]City of Lincoln sewage facility left unshielded
NF Not Feasible, NR No Receptors

Table 4-12 Soundwalls Evaluated for Abatement Alternative AAC2

Sound Wall	Recvr(s) Protected	SW Height	Length (ft)	SW Location Description	Total Reasonable Allowance	Engineers estimate
C2.1	19 (Comm.)	3.0 m (10 ft)	671 m (2,200 ft)	N/B SR 65 to Ferrari Ranch Off-Ramp 165+00 to 187+00	NR	NR
		3.6 m (12 ft)	671 m (2,200 ft)	N/B SR 65 to Ferrari Ranch Off-Ramp 165+00 to 187+00	NR	NR
		4.3 m (14 ft)	671 m (2,200 ft)	N/B SR 65 to Ferrari Ranch Off-Ramp 165+00 to 187+00	NR	NR
		4.6 m (16 ft)	671 m (2,200 ft)	N/B SR 65 to Ferrari Ranch Off-Ramp 165+00 to 187+00	NR	NR
C2.2	20, 29 (3-D Dev.)	3.0 m (10 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR 65 187+00 to 248+00	NF	NF
		3.6 m (12 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR 65 187+00 to 248+00	$1,591,000	$1,579,900
		4.3 m (14 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR 65 187+00 to 248+00	$1,591,000	$1,843,300
		4.6 m (16 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR 65 187+00 to 248+00	$1,591,000	$2,764,900
C2.3[1]	30 (3-D Dev)	3.0 m (10 ft)	975 m (3,200 ft)	S/B SR 65 248+00 to 216+00	$1,400,000	$690,700

Sound Wall	Recvr(s) Protected	SW Height	Length (ft)	SW Location Description	Total Reasonable Allowance	Engineers estimate
		3.6 m (12 ft)	975 m (3,200 ft)	S/B SR 65 248+00 to 216+00	$1,480,000	$828,800
		4.3 m (14 ft)	975 m (3,200 ft)	S/B SR 65 248+00 to 216+00	$1,480,000	$967,000
		4.6 m (16 ft)	975 m (3,200 ft)	S/B SR 65 248+00 to 216+00	$1,560,000	$1,450,400
C2.4	18	3.0 m (10 ft)	671 m (2,200 ft)	E/B SR 65 Ferrari Ranch to S/B SR 65 187+00 to 165+00	$2,220,000	$474,900
		3.6 m (12 ft)	671 m (2,200 ft)	E/B SR 65 Ferrari Ranch to S/B SR 65 187+00 to 165+00	$2,220,000	$569,800
		4.3 m (14 ft)	671 m (2,200 ft)	E/B SR 65 Ferrari Ranch to S/B SR 65 187+00 to 165+00	$2,340,000	$664,800
		4.6 m (16 ft)	671 m (2,200 ft)	E/B SR 65 Ferrari Ranch to S/B SR 65 187+00 to 165+00	$2,340,000	$997,200
C2.5	15,21	3.0 m (10 ft)	1402 m (4,600 ft)	N/B SR 65 to Nicolaus Off-Ramp 257+00 to 303+00	NF	NF
		3.6 m (12 ft)	1402 m (4,600 ft)	N/B SR 65 to Nicolaus Off-Ramp 257+00 to 303+00	NF	NF
		4.3 m (14 ft)	1402 m (4,600 ft)	N/B SR 65 to Nicolaus Off-Ramp 257+00 to 303+00	$2,145,000	$1,390,000
		4.6 m (16 ft)	1402 m (4,600 ft)	N/B SR 65 to Nicolaus Off-Ramp 257+00 to 303+00	$2,145,000	$2,085,000
C2.6nb	25	3.0 m (10 ft)			NF	NF
		3.6 m (12 ft)			NF	NF
		4.3 m (14 ft)			NF	NF
		4.6 m (16 ft)			NF	NF
C2.6sb[2]	16a	3.0 m (10 ft)	1494 m (4,900 ft)	S/B SR 65 Venture to Nicolaus OR 303+00 to 352+00	NF	NF
		3.6 m (12ft)	1494 m (4,900 ft)	S/B SR 65 Venture to Nicolaus OR 303+00 to 352+00	NF	NF
		4.3 m (14 ft)	1494 m (4,900 ft)	S/B SR 65 Venture to Nicolaus OR 303+00 to 352+00	NF	NF
		4.6 m (16 ft)	1494 m (4,900 ft)	S/B SR 65 Venture to Nicolaus OR 303+00 to 352+00	$1,050,000	$2,221,000
C2.6sb[3] (altern)	16a	3.0 m (10 ft)	610 m (2,000 ft)	S/B SR 65 335+00 to 355+00	NF	NF
		3.6 m (12ft)	610 m (2,000 ft)	S/B SR 65 335+00 to 355+00	NF	NF
		4.3 m (14 ft)	610 m (2,000 ft)	S/B SR 65 335+00 to 355+00	NF	NF
		4.6 m (16 ft)	610 m (2,000 ft)	S/B SR 65 335+00 to 355+00	$700,000	$906,500
C2.7[4]	22,23,30 (Lincoln West Dev)	3.0 m (10 ft)	1311 m (4,300 ft)	E/B Nicolaus to S/B SR 65 303+00 to 260+00	NF	NF
		3.6 m (12 ft)	1311 m (4,300 ft)	E/B Nicolaus to S/B SR 65 303+00 to 260+00	NF	NF
		4.3 m (14 ft)	1311 m (4,300 ft)	E/B Nicolaus to S/B SR 65 303+00 to 260+00	NF	NF
		4.6 m (16 ft)	1311 m (4,300 ft)	E/B Nicolaus to S/B SR 65 303+00 to 260+00	$1,855,000	$1,949,000
C.2.12	10a	3.0 m (10 ft)			NF	NF
		3.6 m (12 ft)			NF	NF
		4.3 m (14 ft)			NF	NF
		4.6 m (16 ft)			NF	NF
C2.13	10b	3.0 m (10 ft)	304.8 m (1,000 ft)	E/B Wise Road near SR 65	NR	NR
		3.6 m (12 ft)	304.8 m (1,000 ft)	E/B Wise Road near SR 65	NR	NR

Sound Wall	Recvr(s) Protected	SW Height	Length (ft)	SW Location Description	Total Reasonable Allowance	Engineers estimate
		4.3 m (14 ft)	304.8 m (1,000 ft)	E/B Wise Road near SR 65	NR	NR
		4.6 m (16 ft)	304.8 m (1,000 ft)	E/B Wise Road near SR 65	NR	NR
C2.10	4	3.0 m (10 ft)	6187 m (20,300 ft)	N/B SR 65 450+00 to 650+00	NR	NR
		3.6 m (12 ft)	6187 m (20,300 ft)	N/B SR 65 450+00 to 650+00	NR	NR
		4.3 m (14 ft)	6187 m (20,300 ft)	N/B SR 65 450+00 to 650+00	NR	NR
		4.6 m (16 ft)	6187 m (20,300 ft)	N/B SR 65 450+00 to 650+00	NR	NR
C2.11	5	3.0 m (10 ft)	5060 m (16,600 ft)	S/B SR 65 650+00 to 490+00	$74,000	$3,582,900
		3.6 m (12 ft)	5060 m (16,600 ft)	S/B SR 65 650+00 to 490+00	$74,000	$4,299,400
		4.3 m (14 ft)	5060 m (16,600 ft)	S/B SR 65 650+00 to 490+00	$78,000	$5,016,000
		4.6 m (16 ft)	5060 m (16,600 ft)	S/B SR 65 650+00 to 490+00	$78,000	$7,524,000
C2.8	2	3.0 m (10 ft)			NF	NF
		3.6 m (12 ft)			NF	NF
		4.3 m (14 ft)			NF	NF
		4.6 m (16 ft)			NF	NF
C2.9	1	3.0 m (10 ft)			NF	NF
		3.6 m (12 ft)			NF	NF
		4.3 m (14 ft)			NF	NF
		4.6 m (16 ft)			NF	NF

[1] Southwest quad of SR 65 @ Ferrari Ranch is commercial (NR-26)
[2] 16b NF for all heights
[3] Shields 16a only
[4] If homes are condemned west of SR 65 from station 289+00 to 275+00 soundwalls may be dropped for this segment. Undetermined at this time
NF- Not Feasible, NR- No Receptors

Table 4-13 Soundwalls Evaluated for Abatement Alternative D1

Sound Wall	Recvr(s) Protected	SW Height	Length (ft)	SW Location Description	Total Reasonable Allowance	Engineers estimate
D1.1	19 (Comm.)	3.0 m (10 ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 168+00 to 190+00	NR	NR
		3.6 m (12ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 168+00 to 190+00	NR	NR
		4.3 m (14 ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 168+00 to 190+00	NR	NR
		4.6m (16 ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 168+00 to 190+00	NR	NR
D1.2a[1]	20	3.0 m (10 ft)	610 m (2,000ft)	W/B Ferrari Ranch to N/B SR65 190+00 to 210+00	NF	NF
		3.6 m (12ft)	610 m (2,000ft)	W/B Ferrari Ranch to N/B SR65 190+00 to 210+00	NF	NF
		4.3 m (14 ft)	610 m (2,000ft)	W/B Ferrari Ranch to N/B SR65 190+00 to 210+00	$700,000	$604,400
		4.6 m (16ft)	610 m (2,000ft)	W/B Ferrari Ranch to N/B SR65 190+00 to 210+00	$700,000	$906,500
D1.2b[1]	29 (3-D Dev.)	3.0 m (10 ft)	610 m (2,000ft)	N/B SR65 220+00 to 240+00	NF	NF
		3.6 m (12ft)	610 m (2,000ft)	N/B SR65 220+00 to 240+00	$805,000	$518,000

Sound Wall	Recvr(s) Protected	SW Height	Length (ft)	SW Location Description	Total Reasonable Allowance	Engineers estimate
		4.3 m (14 ft)	610 m (2,000ft)	N/B SR65 220+00 to 240+00	$851,000	$604,400
		4.6m (16 ft)	610 m (2,000ft)	N/B SR65 220+00 to 240+00	$851,000	$906,500
D1.3[2]	30 (3-D Developm ent)	3.0 m (10 ft)	610 m (2,000ft)	S/B SR65 240+00 to 220+00	$1,400,000	$431,700
		3.6 m (12ft)	610 m (2,000ft)	S/B SR65 240+00 to 220+00	$1,480,000	$518,000
		4.3 m (14 ft)	610 m (2,000ft)	S/B SR65 240+00 to 220+00	$1,480,000	$604,400
		4.6 m (16ft)	610 m (2,000ft)	S/B SR65 240+00 to 220+00	$1,560,000	$906,500
D1.4	18	3.0 m (10 ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 190+00 to 168+00	$2,100,000	$474,900
		3.6 m (12ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 190+00 to 168+00	$2,100,000	$569,800
		4.3 m (14 ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 190+00 to 168+00	$2,100,000	$664,800
		4.6 m (16ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 190+00 to 168+00	$2,220,000	$997,200
D1.5	14	3.0 m (10 ft)	671 m (2,200 ft)	N/B65 249+00 to 271+00	$37,000	$474,900
		3.6 m (12ft)	671 m (2,200 ft)	N/B65 249+00 to 271+00	$37,000	$569,800
		4.3 m (14 ft)	671 m (2,200 ft)	N/B65 249+00 to 271+00	$39,000	$664,800
		4.6 m (16ft)	671 m (2,200 ft)	N/B65 249+00 to 271+00	$39,000	$997,200
D1.6	13	3.0 m (10 ft)	823 m (2,700ft)	N/B65 322+00 to 349+00	$1,036,000	$582,800
		3.6 m (12ft)	823 m (2,700ft)	N/B65 322+00 to 349+00	$1,036,000	$699,300
		4.3 m (14 ft)	823 m (2,700ft)	N/B65 322+00 to 349+00	$1,092,000	$815,900
		4.6 m (16ft)	823 m (2,700ft)	N/B65 322+00 to 349+00	$1,092,000	$1,223,800
D1.11	12	3.0 m (10 ft)			NF	NF
		3.6 m (12ft)			NF	NF
		4.3 m (14 ft)			NF	NF
		4.6 m (16ft)			NF	NF
D1.10	7	3.0 m (10 ft)	1433 m (4,700ft)	N/B SR65 505+00 to 552+00	NF	NF
		3.6 m (12ft)	1433 m (4,700ft)	N/B SR65 505+00 to 552+00	NF	NF
		4.3 m (14 ft)	1433 m (4,700ft)	N/B SR65 505+00 to 552+00	NF	NF
		4.6 m (16f ft)	1433 m (4,700ft)	N/B SR65 505+00 to 552+00	NF	NF
D1.7	4	3.0 m (10 ft)	823 m (2,700ft)	N/B SR65 621+00 to 648+00	NF	NF
		3.6 m (12ft)	823 m (2,700ft)	N/B SR65 621+00 to 648+00	$35,000	$699,300
		4.3 m (14 ft)	823 m (2,700ft)	N/B SR65 621+00 to 648+00	$35,000	$815,900
		4.6 m (ft)	823 m (2,700ft)	N/B SR65 621+00 to 648+00	$35,000	$1,223,800
D1.9	2	3.0 m (10 ft)	427 m (1,400ft)	W/B Riosa Rd to N/B SR65 691+00 to 701+00	$210,000	$302,200
		3.6 m (12ft)	427 m (1,400ft)	W/B Riosa Rd to N/B SR65 691+00 to 701+00	$210,000	$362,600
		4.3 m (14 ft)	427 m (1,400ft)	W/B Riosa Rd to N/B SR65 691+00 to 701+00	$210,000	$423,100
		4.6 m (16 ft)	427 m (1,400ft)	W/B Riosa Rd to N/B SR65 691+00 to 701+00	$222,000	$634,600
D1.8	1	3.0 m (10 ft)	1372 m (4,500ft)	N/B SR65 705+00 to 750+00	NR	NR
		3.6 m (12ft)	1372 m (4,500ft)	N/B SR65 705+00 to 750+00	NR	NR
		4.3 m (14 ft)	1372 m (4,500ft)	N/B SR65 705+00 to 750+00	NR	NR

Sound Wall	Recvr(s) Protected	SW Height	Length (ft)	SW Location Description	Total Reasonable Allowance	Engineers estimate
		4.6 m (16 ft)	1372 m (4,500ft)	N/B SR65 705+00 to 750+00	NR	NR

[1] Section of SR65 traverses thru Ag land, [2] SW quad of SR65/Woodside I/C is commercial
NF Not Feasible, NR No Receptors

Table 4-14 Soundwalls Evaluated for Abatement Alternative D13

Sound Wall	Recvr(s) Protected	SW Height	Length (ft)	SW Location Description	Total Reasonable Allowance	Engineers estimate	Soundwall Reasonable & Feasible
D13.1	19 (Comm.)	3.0 m (10 ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 664+00 to 686+00	NF	NF	No
		3.6 m (12 ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 664+00 to 686+00	$1,890,000	$569,800	No
		4.3 m (14 ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 664+00 to 686+00	$1,890,000	$664,800	yes
		4.6 m (16 ft)	671 m (2,200 ft)	N/B SR65 to Ferrari Ranch Off-Ramp 664+00 to 686+00	$1,998,000	$997,200	yes
D13.2	20, 29 (3D Dev)	3.0 m (10 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR65 686+00 to 747+00	NF	NF	No
		3.6 m (12 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR65 686+00 to 747+00	NF	NF	No
		4.3 m (14 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR65 686+00 to 747+00	$1,505,000	$1,843,300	no
		4.6 m (16 ft)	1859 m (6,100 ft)	W/B Ferrari Ranch to N/B SR65 686+00 to 747+00	$1,591,000	$2,764,900	no
D13.3	30(3-D Dev	3.0 m (10 ft)	1036 m (3,400 ft)	S/B SR65 746+00 to 712+00	NF	NF	No
	26 (Lincoln Crossing)	3.6 m (12 ft)	1036 m (3,400 ft)	S/B SR65 746+00 to 712+00	$1,400,000	$880,600	Yes
		4.3 m (14 ft)	1036 m (3,400 ft)	S/B SR65 746+00 to 712+00	$1,480,000	$1,027,400	Yes
		4.6 m (16 ft)	1036 m (3,400 ft)	S/B SR65 746+00 to 712+00	$1,480,000	$1,541,100	no
D13.4	18	3.0 m (10 ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 686+00 to 664+00	NF	NF	No
		3.6 m (12 ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 686+00 to 664+00	$2,220,000	$569,800	yes
		4.3 m (14 ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 686+00 to 664+00	$2,220,000	$664,800	Yes
		4.6 m (16 ft)	671 m (2,200 ft)	E/B Ferrari Ranch to S/B SR65 686+00 to 664+00	$2,340,000	$997,200	Yes
D13.6	27,28	3.0 m (10 ft)	488 m (1,600 ft)	N/B SR65 765+00 to 781+00	NF	NF	No
		3.6 m (12 ft)	488 m (1,600 ft)	N/B SR65 765+00 to 781+00	NF	NF	No
		4.3 m (14 ft)	488 m (1,600 ft)	N/B SR65 765+00 to 781+00	$2,960,000	$483,500	No
		4.6 m (16 ft)	488 m (1,600 ft)	N/B SR65 765+00 to 781+00	$3,120,000	$725,200	Yes
D13.11	14	3.0 m (10 ft)	610 m (2,000 ft)	S/B SR65 783+00 to 763+00	NF	NF	No
		3.6 m (12 ft)	610 m (2,000 ft)	S/B SR65 783+00 to 763+00	NF	NF	No
		4.3 m (14 ft)	610 m (2,000 ft)	S/B SR65 783+00 to 763+00	NF	NF	No
		4.6 m (16 ft)	610 m (2,000 ft)	S/B SR65 783+00 to 763+00	NF	NF	No
D13.10	13	3.0 m (10 ft)	427 m (1,400 ft)	N/B SR65 833+00 to 847+00	NF	NF	No
		3.6 m (12 ft)	427 m (1,400 ft)	N/B SR65 833+00 to 847+00	NF	NF	No
		4.3 m (14 ft)	427 m (1,400 ft)	N/B SR65 833+00 to 847+00	NF	NF	No

Sound Wall	Recvr(s) Protected	SW Height	Length (ft)	SW Location Description	Total Reasonable Allowance	Engineers estimate	Soundwall Reasonable & Feasible
		4.6 m (16 ft)	427 m (1,400 ft)	N/B SR65 833+00 to 847+00	NF	NF	No
D13.9	11	3.0 m (10 ft)	2438 m (8,000 ft)	N/B SR65 915+00 to 1005+00	NF	NF	No
		3.6 m (12 ft)	2438 m (8,000 ft)	N/B SR65 915+00 to 1005+00	NF	NF	No
		4.3 m (14 ft)	2438 m (8,000 ft)	N/B SR65 915+00 to 1005+00	NF	NF	No
		4.6 m (16 ft)	2438 m (8,000 ft)	N/B SR65 915+00 to 1005+00	NF	NF	No
D13.8	7	3.0 m (10 ft)	518 m (1,700 ft)	S/B SR65 1043+00 to 1060+00	NF	NF	No
		3.6 m (12 ft)	518 m (1,700 ft)	S/B SR65 1043+00 to 1060+00	NF	NF	No
		4.3 m (14 ft)	518 m (1,700 ft)	S/B SR65 1043+00 to 1060+00	NF	NF	No
		4.6 m (16 ft)	518 m (1,700 ft)	S/B SR65 1043+00 to 1060+00	NF	NF	No
D13.5	4	3.0 m (10 ft)	945 m (3,100 ft)	N/B SR65 1145+00 to 1176+00	NF	NF	No
		3.6 m (12 ft)	945 m (3,100 ft)	N/B SR65 1145+00 to 1176+00	$35,000	$802,900	No
		4.3 m (14 ft)	945 m (3,100 ft)	N/B SR65 1145+00 to 1176+00	$35,000	$936,800	No
		4.6 m (16 ft)	945 m (3,100 ft)	N/B SR65 1145+00 to 1176+00	$35,000	$1,405,100	No

NF- Not Feasible, NR- No Receptors

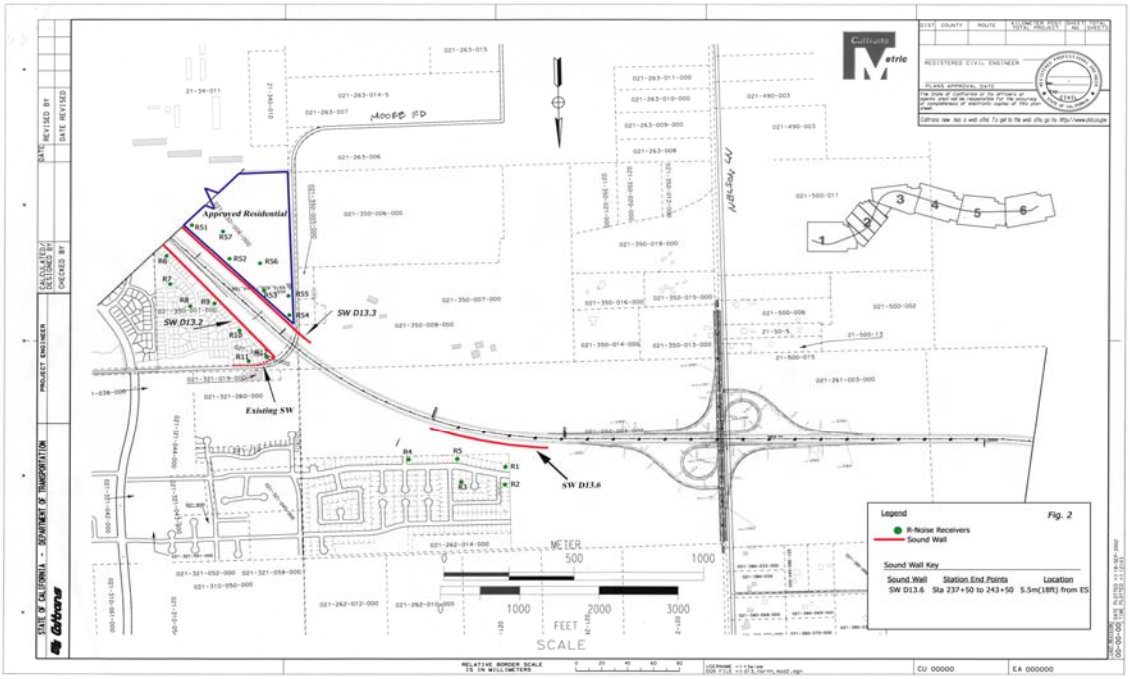
4.5.3 Preliminary Noise Abatement Decision (Soundwall Descriptions)

Based on the studies completed and public and local government comment, Caltrans intends to incorporate noise abatement measures in the form of sound walls at the locations identified in Table 4-15. It is noted the City of Lincoln is not in favor of a sound wall shielding the proposed community park, located at SR65 and Ferrari Ranch Road, due to public safety concerns arising from potential illicit activity. Modeling based on current design data indicates that the barriers would result in a noise level reduction of 5 dBA to 11 dBA. If, during final design conditions have substantially changed, noise barriers may either be modified or not provided. The final decision of the noise barriers will be made upon completion of the project design and the public involvement process.

Table 4-15 Proposed Soundwalls

	Sound Wall	Height (ft)	Length (ft)	SW Location Description
D13	D13.2	4.3 m (14 ft)	1090 m (3575 ft)	N/B SR65 ES 221+60 to 223+00, N/B SR65 R/W Line 223+00 to 232+50
	D13.3	Ht. Varies	1780m (3838 ft)	SB SR65 R/W Line 233+00 to 217+30 = 4.3m(14 ft), 217+30 to 215+20 = 4.9m(16 ft)
	D13.4	Ht. Varies	1030 m (3378 ft)	S/B SR65 ES 214+80 to 213+30 = 4.3m(14 ft), 213+30 to 211+40 = 3.7m (12 ft), 211+40 to 204+50 = 3.0 m (10 ft)
	D13.6	4.9 m (16 ft)	600 m (1,968 ft)	N/B SR65 5.5m from ES 237+50 to 243+50

Figure 4-1 Sound Barrier Locations



4.5.4 Construction Noise Impacts

Two types of short-term noise impacts would occur during construction of the project. First, construction crew commutes and the transport of construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the site. The pieces of heavy equipment for grading and construction activities will be moved on site, will remain for the duration of each construction phase and will not add to the daily traffic volume. When added to the current traffic volumes along SR 65 and Main Street, the projected volume of construction traffic will be small and its associated long-term noise level change will not be perceptible. However, there will be a relatively high single event noise exposure potential with passing trucks at a maximum level of 87 dBA L_{max} at 15.24 m (50 ft).

The second type of short-term noise impact is related to noise generated during excavation, grading and building erection on the project site. Construction of the proposed project is expected to require the use of earthmovers, bulldozers, water and pickup trucks. Noise typically associated with the use of construction equipment is estimated between 79 and 89 dBA at a distance of 50 feet from the project site for the grading phase.

Construction noise impact abatement

Initial construction has the potential to create noise impacts at the homes located along SR 65 and avoidance and minimization measures are warranted to reduce these impacts to the extent feasible. Implementation of these measures would reduce construction noise impacts. Applicable measures include the following:

- Standard practice requires that construction be restricted to between the hours of 7:00 a.m. and 7:00 p.m. (8:00 a.m. and 7:00 p.m. on Saturdays) and not permitted on Sundays and Federal holidays.
- All construction equipment must conform to the provisions of the Department Standard Specifications, Section 7-10/I; "Sound Control Requirements." This section requires the contractor to comply with all local rules and regulations (i.e., City of Lincoln and Placer County) that apply to any work as part of the contract.
- Portable equipment will be located as far as possible from noise sensitive locations as is feasible.
- Construction vehicle staging areas and equipment maintenance areas will be located as far as possible from sensitive receptor locations.

4.6 WATER QUALITY

This section summarizes the Water Quality Assessment Report, which documents the streams, lakes, rivers and other receiving waters that could be affected by this project and the potential impacts on those waters by the construction and maintenance of each alternative. In addition, this section evaluates the project for compliance with the Sole Source Aquifer (SSA) program and the Drinking Water Source Assessment and Protection (DWSAP) program.

Other regulatory requirements discussed below are the USACE Section 404 permit, the California Department of Fish and Game 1602 Agreement, and the California Regional Water Quality Control Board Section 401 water quality certification and the National Pollution Discharge Elimination System (NPDES) permit.

In Section 4.8, Natural Resources, the impacts of the project on water quality are discussed as they pertain to the natural resources and protected species.

Potential impacts for this project can be divided into those associated with short-term construction activities and long-term operations and maintenance activities. The construction activities discussed below would apply to all of the build alternatives, while the operation activities would apply to all the "build" and "no build" alternatives.

4.6.1 Regulatory Requirements

The National Pollution Discharge Elimination System (NPDES) was established by the EPA and implemented by the states Regional Water Quality Control Boards. Caltrans currently has a statewide permit for the NPDES program. Caltrans has developed a State Storm Water Management Plan (SWMP) designed to reduce the discharge of pollutants associated with storm water and non-storm water to the maximum extent practicable. The SWMP describes how Caltrans will comply with NPDES requirements through the application of various Best Management Practices (BMPs). BMPs include those practices that provide pollution control benefit, are feasible to implement and meet legal and legislative funding restraints (Camp, Dresser & McKee 1999).

In addition to BMPs, the SWMP requires a Storm Water Pollution Prevention Plan (SWPPP) for projects where the impacts are greater than 2 ha (5 ac). Requirements of permits and plans would be followed in accordance with the States SWMP addressing erosion control and sediment control management. This project would require submittal of a SWPPP from the construction Contractor prior to the start of construction activities. The SWPPP will address water pollution controls during construction. The SWPPP specifies measures to prevent soil, sediments, construction materials, and fluids from being carried off the site by storm water. Such measures typically include: covering stockpiles with polyethylene materials; placement of sediment trapping devices surrounding drainage inlets and storm drain openings as well as the toe of slopes; and use of temporary, on-site storage systems for contaminated waters and excavated materials. Additionally, the SWPPP would identify locations where lubricants, fuels, reinstates, and other fluids are to be handled, and discuss measures to be implemented for controlling spills

Other regulatory/permit requirements are the USACE Section 404 permit, the California Department of Fish and Game Section 1602 Stream Bed Alteration Agreement and the California Regional Water Quality Control Board Section 401 water quality certification. These requirements are discussed in more depth in the Natural Resources section. Measures to comply with permit requirements as they pertain to water quality are discussed below.

4.6.2 Impacts on Sole Source Aquifers or Well Head Protection Areas

To help prevent groundwater contamination, the EPA has established the Sole Source Aquifer (SSA) program. The SSA program was established to increase public awareness of groundwater resources and help prevent contamination of aquifers that are the only available local or regional source of drinking water and supply more than 50

percent of a community's drinking water. The EPA web site listing the SSA in California was consulted and showed no sole source aquifer in Placer County (EPA, 1999).

The State of California Department of Health Services (DHS) recently developed the Drinking Water Source Assessment and Protection Program (DWSAP) program to help protect drinking water wells from contamination. All public water supply wells used for domestic purposes will be subject to the DWSAP. This program evaluates individual wells' susceptibility for potential contamination caused by existing conditions (e.g., underground tanks, septic systems, etc.), and provides guidelines to evaluate the potential impacts of proposed projects such as the Lincoln Bypass.

4.6.3 Groundwater Impacts

The only penetration into the water table that would be anticipated as part of any build alternatives would be support piles and footings for bridges and structures. These minor and isolated intrusions are not expected to impact the quality of groundwater.

Wells within the proposed right-of-way will be treated in accordance with the requirements set forth in the Highway Design Manual (Caltrans 1992) and other California codes. (See Figure 3-14 in Chapter 3) Municipal wells are required to have wellhead protection areas delineated under the State of California Department of Health Services DWSAP program. These protection areas can be delineated in a site-specific manner or in a more general calculated fixed radius (CFR) method. Until the City of Lincoln completes their delineation, the CFR minimum distances will be considered in the design: 183 m (600 ft) for Zone A (microbiological), 305 m (1,000 ft) for Zone B5 (chemical), and 457 m (1,500 ft) for Zone B10 (chemical). The final delineation of the wellhead protection areas is anticipated to be complete before the Department completes designing the preferred alternative. Wells are shown in Figure 3-14 in Chapter 3. Additional municipal wells may need to be provided for the water supply for the City of Lincoln. This is not expected to impact the quality of ground water.

Impacts to groundwater for all of the alternatives are minor. The remainder of this water quality section focuses on surface water quality impacts.

4.6.4 Construction Impacts

Suspended material caused by erosion in storm water runoff is considered by Caltrans as a pollutant of primary importance. Project construction activities such as grading and vegetation removal would result in soil and ground disturbances, creating loose or unprotected soil that could be transported by surface runoff or wind to nearby watercourses. Such increases in sediment and turbidity could negatively affect receiving water quality. These impacts have the potential to occur for the duration of construction

activities. Beneficial uses that could be affected include REC-1, REC-2, WARM, COLD, WILD, MIGR and SPWN[1].

The following construction activities would be part of any of the build alternatives, and may contribute to increases in sediment, turbidity, and floating materials to receiving waters:

- **Daily contractor activity** - Routine construction activities such as material delivery, storage and usage, waste management, vehicle/equipment cleaning and operation and use of a construction staging area could result in generation of dust, sediments and debris.
- **Vegetation removal/trimming** - Removal or trimming of vegetation would be required for both construction and access. This activity would eliminate the groundcover that protects the topsoil. Exposed topsoil would be more susceptible to erosion. Additionally, trimmings could fall or be carried by runoff into surface waters, resulting in introduction of floating material and the potential for increased organic loading to the creeks.
- **Grading** - Grading would include removal of the natural and/or stabilizing cover (topsoil) and the creation of engineered slopes using fill material. Prior to establishment of temporary or permanent erosion control measures, graded material would be highly susceptible to erosion.
- **Temporary roads** - Construction of temporary roads would require grading, vegetation removal and other changes to the topography and drainage characteristics of the watershed. These temporary roads are typically composed of native material and/or aggregate base rock.
- **Activities within the creek corridor** - Construction of culverts, bridges and viaducts require an extensive presence in stream corridors. These activities may also require construction of temporary access roads; temporary cofferdams and/or jetties to re-route the watercourses.
- **De-watering** - Construction may require localized de-watering in areas of shallow groundwater. De-watering activities would be continuous but temporary for the duration of work in a particular area. Discharged groundwater may be high in turbidity.

[1] The beneficial uses for the two watersheds are: MUN = Municipal, AGR I = Agricultural Irrigation, AGR S = Ag. Stock Watering, POW = Industry Power, REC-1 = Recreation Contact, REC-2 = Other Non-Contact Recreation, WARM = Freshwater Habitat Warm, COLD = Freshwater Habitat Cold, MIGR(W) = Migration Warm, MIGR(C) = Migration Cold, SPWN(W) = Spawning Warm, SPWN(C) = Spawning Cold, and WILD = Wildlife Habitat.

- **Construction of temporary structures** - To support construction equipment, laborers and construction forms, it would be necessary to erect falsework. Falsework is typically constructed of wood and metal connectors. Although the majority of woodcutting would take place outside of the stream corridors, some woodcutting would be necessary as the falsework is erected. This woodcutting could introduce sawdust to surface waters. Disassembly of the falsework may result in small pieces of wood, nails and metal cuttings entering creeks.
- **Seeding and application of fertilizers and nutrients** - To prepare the ground for temporary and/or permanent cover and promote better growth, fertilizers and plant nutrients may be applied before and after planting. In the early stages of the seeding process, surface runoff could wash some of the re-vegetation material, fertilizers, nutrients and seeds into surface waters.

Avoidance and minimization of Construction impacts due to erosion

To address these potential water quality impacts, Caltrans would require the contractor to use a combination of BMPs during construction through the Plans, Specification and Estimates (PS&E) documents. BMPs include temporary erosion controls such as silt fencing, fiber rolls and drill seeding with tackifier, which will be used during the construction process as required to preserve water quality. The Department would include special provisions in the PS&E for this project requiring the contractor to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP), and other project specific Standard Special Provisions (SSP).

The purpose of the BMP is to stabilize disturbed soil, to minimize erosion and to capture and remove sediment suspended in runoff before the runoff leaves the site. These measures would provide a high degree of protection to the local receiving waters from discharge of sediment during construction. With the implementation of Caltrans standard practices and procedures, all of the build alternatives have minimized impacts from construction-induced erosion.

4.6.5 Construction impacts from Oil, Greases, and Chemical Contamination

Construction activities may introduce chemicals, oils and greases that could be carried by surface runoff to surface water if not properly managed. These impacts have the potential to occur for the duration of construction activities. Beneficial uses that could be impacted include REC-1, REC-2, WARM, COLD, RARE, MIGR and SPWN. The following construction activities would be part of any of the build alternatives:

- **Cement and grout** - As part of the bridge construction process, concrete and grout work would take place within stream corridors. Spillage of concrete and grout into

receiving waters during bridge construction could increase turbidity and alter the pH.

- **Application and storage of chemicals** - Accidental spills, improper storage, and improper application of chemicals during construction could potentially impact water quality. Chemicals such as herbicides and fertilizers could also be washed into the creeks. Herbicides could be poisonous to fish and aquatic plants. Conversely, fertilizers may promote algae growth, which would reduce dissolved oxygen levels.
- **Application and storage of oils, greases and fuels** - Improper storage of oils and fuels could result in accidental spills and/or leaks within the construction area. Accidental spills during refueling and maintenance of construction vehicles and equipment could occur. Surface runoff could transport these materials to the local creeks. Similarly, application of petroleum chemicals during road construction could be washed into surface waters. These materials could have toxic effects on aquatic organisms.

Avoidance and Minimization of Construction impacts from Oil, Grease or chemical contamination

Caltrans SSP prohibit the contractor from discharging oils, greases or chemicals into receiving waters. For example, on this project, equipment operating in water bodies would be required to be steam cleaned prior to arrival on site and be maintained in a clean condition during the length of activities. With implementation of the BMPs and SSPs, none of the build alternatives would have a negative impact on the environment from construction-induced oils, greases and chemicals.

4.6.6 Construction Impacts Due To Increases in Water Temperature

Certain construction activities may contribute to short-term temperature changes of the surface water. Beneficial uses that could be affected include COLD, MIGR and SPWN. These activities include:

- **Concrete curing** - Piers are typically constructed using reinforced concrete. Once concrete is poured in the forms, it takes up to several weeks to set - referred to as the curing period. During the curing period, concrete releases heat into its surrounding environment. Water is often used during this process to prevent the concrete from hardening too fast. To the extent that this water were to reach surface waters, it could cause a localized increase in the ambient temperature.
- **Vegetation removal/trimming** - During construction, vegetation at or near the creeks would require trimming or removal. Vegetation provides shade, which

maintains cooler water temperature in the creeks. Once vegetation is removed or trimmed, water temperatures may increase due to exposure to direct sunlight.

- **Creek realignment** - Where segments of creeks are realigned, they may not have the same canopy cover/shade as before the project. Prior to vegetation reestablishment, increases in temperature may occur.

Avoidance and Minimization for Short-Term Increases in Water Temperature

Concrete curing would occur over a period of several weeks. It is so localized in nature that it is not expected to have a major impact on water temperature.

Regarding vegetation removal/trimming and creek realignments, Caltrans will follow standard practices for minimizing the amounts of vegetation trimmed or removed at crossings. To some extent, shade provided by the new crossings would tend to offset some loss in canopy cover through trimming/removal and realignment. Measurable temperature impacts are not expected where work is done in limited areas.

Treatment of runoff, such as diverting the water to detention ponds, may be required where storm water enters sensitive receiving waters, such as vernal pools. Additional drainage studies, surveys and bridge modeling will be required to finalize project plans and minimize floodplain encroachment.

4.6.7 Long-term Impacts to Water Quality Due to Erosion

As previously mentioned, sediment is of specific concern in the project area since it is listed as a source of impairment to beneficial uses. Following the construction process, disturbed areas would be stabilized through permanent re-vegetation or other means. The Storm Water Quality Handbook-Project Planning and Design Guide (PPDG) provides detailed procedures for design of permanent slope stabilization controls. Storm runoff detention is typically provided by detention ponds accessed via roadside ditches (Caltrans 1999).

In spite of re-vegetation efforts, sediment and turbidity could effect water quality. These impacts have the potential to occur for the duration of the project operation. Beneficial uses that could be affected include REC-1, REC-2, WARM, COLD, WILD, MIGR and SPWN. The following factors may also contribute to negative impacts:

- **Hydrologic impacts** - The increase in impervious areas could cause an increase in the peak flow and higher runoff volumes that could lead to stream downcutting, stream bank erosion and loss of stream structure. The result could be an increase in sediment and turbidity in receiving waters. Along with the increase in sediment, there is an increased opportunity for pollutants such as herbicides and road pollution to enter the streams.

- **Concentration of runoff** - Typical highway drainage design involves collecting runoff in pipes or ditches and discharging, either directly or indirectly, into creeks. To the extent that localized flows were concentrated and/or altered from pre-project conditions, potential impacts would be similar to those described for increases in impervious areas.

Avoidance and Minimization for long-term impacts of erosion

To address these potential water quality impacts resulting from project hydrology and concentration of runoff, the Department would utilize permanent BMPs incorporated into the design and construction of the project in combination with BMPs during maintenance operations.

Examples of the BMPs are directing highway runoff via ditches and culverts into retention basins and grading of embankments to minimize erosion potential.

In addition, the PPDG require that the design team take into account hydrologic impacts of the project and provide measures such that stream channel stability is maintained. With these measures in place, long-term impacts due to erosion will be minimal.

4.6.8 Long-term impacts from Oils, Greases, and Chemical Contamination

Highway runoff and other long-term maintenance activities may introduce chemicals, oils and greases to surface water. Beneficial uses that could be impacted include REC-1, REC-2, WARM, COLD, WILD and SPWN. Typical highway related activity and maintenance that affect runoff quality are:

- **Highway runoff** - Contaminants generated by traffic, pavement materials and airborne particles that settle and are carried by runoff into receiving waters.
- **Accidental spills** - Spills caused by highway-related traffic accidents have the ability to cause great damage to water quality, depending on the type and quantity of the material spilled.
- **Application of chemicals** - Application of chemicals from landscaping operation and maintenance activities could potentially enter into receiving waters. Herbicides could be poisonous to fish and aquatic plants. Conversely, fertilizers may promote algae growth, which would reduce dissolved oxygen levels.

Few, if any, of the hydrocarbons (except oil and grease), volatile and semi-volatile organic compounds or pesticides/herbicides are often found in highway runoff, given the rural setting of the site. There are no large industrial (manufacturing), agri-industrial (packing plants), or agricultural operation/activities in the project area that use large amounts of solvents, pesticides or herbicides.

Table 4-16 summarizes the results of Caltrans study on pollutants of concern in typical highway runoff. Water quality objectives established for the Bear River are also presented. Constituents with mean values exceeding water quality are highlighted in bold type.

Table 4-16 Pollutants of Concern in Typical Highway Runoff

Pollutant	No. of Samples	Mean Value (mg/L)	Water Quality Objective for the Bear River (mg/L)
Barium	25	0.13	1.0
Cadmium	30	0.0009	0.005
Chromium	56	0.0082	0.05
Copper	52	0.035	1.3
Iron	27	3.76	Not listed
Lead	**35**	**0.0814**	**0.015**
Manganese	17	0.08	Not listed
Nickel	56	0.0091	0.1
Zinc	62	0.186	Not listed
Oil and Grease	Not listed	10.3	Qualitative Standard
TSS	Not listed	112	Not Available
COD	Not listed	120	Not Available
Ammonia	25	1.9	Not Available
Nitrate	33	2.8	10
TKN	37	2.6	Not Available
Phosphate	5	0.4	Not Available
Phosphorus	67	0.3	Not Available

Source: Mean Values: Brown and Caldwell, 1997; Water Quality Objectives: RWQCBCVR, 1998.

If concentrations of potential pollutants were not sufficiently diluted upon entering the receiving waters, they could potentially impact water quality. The proposed impervious surface that would create highway runoff was compared to the total area in the watershed to determine whether the proposed project would result in an increase in pollutant loading to the receiving water that would exceed the water quality objectives. Paved surfaces in Caltrans right-of-way are less than 1% of the watershed. Therefore, highway runoff would be sufficiently diluted as to not cause an impact to receiving water quality.

The watershed areas were delineated on 7.5-minute USGS topographic maps. The paved width of the highway was assumed to be 36.6 m (120 ft), the maximum paved area, even though the right-of-way may exceed this dimension in places. The results are as follows:

The **Orchard Creek watershed** above SR 65 covers approximately 17.7 km^2 (11 mi^2) (2849 ha [7040 ac]). All build alternatives will cover about 2.4 km (1.5 mi) (8.8 ha [21.8 ac]) of land. Any of the build alternatives would affect about 0.3% of the watershed.

The **Auburn Ravine watershed** above the City of Lincoln covers an area of about 53 km^2 (33 mi^2) (8547 ha [21120 ac]). The alternative that has the longest section within the Auburn Ravine watershed is D13. This alternative affects about 8.8 ha (21.8 ac) or less than 0.1% of the watershed. Other alternatives would also affect less than 0.1% of the watershed.

The **Markham Ravine watershed** above the D alternatives is about 19.3 km^2 (12 mi^2) (3108 ha [7680 ac]). The D alternatives affect about 20.6 ha (50.9 ac) or less than 0.6% of the watershed. Only 11.26 km^2 (7 mi^2) (1813 ha [4480 ac]) of the Markham Ravine watershed is above the AC alternatives. These alternatives affect about 14.6 ha (36 ac) or approximately 0.8% of the watershed.

The **Coon Creek watershed** covers over 112.6 km^2 (70 mi^2). Approximately 11.7 ha (29 ac) of land will be affected, or less than 0.1% of the watershed.

The **Yankee Slough watershed** above all of the alternatives is about 27.4 km^2 (17 mi^2) (4403 ha [10,880 ac]). The AC and D alternatives affect about 23.6 ha (58.2 ac) or approximately 0.5% of the watershed.

Avoidance and Minimization for long-term impacts of Oil, Grease and Chemical Contamination

The results demonstrate that paved surfaces in the Department's right-of-way would not be a very big percentage of the watershed. In all cases, the paved area is less than 1% of the watershed. Therefore, highway runoff would be sufficiently diluted as to not cause an impact to receiving water quality.

In addition, runoff from the highway right-of-way would be retained on-site to prevent an negative effects on the local surface and groundwater quality. When construction is complete, permanent erosion control measures and landscaping would be implemented throughout the project area. Final plans include short-term detention basins to treat the storm water run-off for run-off that cannot be separated from the sensitive receiving waters. These long ditches would be fairly flat and grass lined to slow the water and allow the grass to act as a filter, filtering out roadway pollutants. Near waterways, there will be an outlet control to hold the water and provide for more filtering. The water would not be held for longer than 72 hours so as not to become a mosquito breeding ground.

Vernal pool complexes that are cut off from sheet flow are included in the total impacts to wetlands. However, culverts will be used extensively to maintain flows to vernal pools. Environmentally Sensitive Areas (ESA's) will be established to prevent herbicides and pesticides from contaminating the vernal pools and waterways.

During final design, a more detailed evaluation will be made of the corridor hydraulics, with particular emphasis on ensuring that existing water flows are maintained. With these measures in place, long term impacts due to oil, grease and chemical contamination will be minimal and less than significant under CEQA.

4.6.9 Long-term Increases in Water Temperature

Certain activities may contribute to long-term temperature changes of the surface water after construction is complete which may affect existing water quality. Beneficial uses that could be affected include COLD, MIGR and SPWN. These activities include:

- **Increase in paved areas** - Due to continuous use and its affinity to absorb heat from sunlight, pavement surfaces may get warmer than soil. Highway runoff may be warmer than pre-project runoff temperature.
- **Creek crossings and realignments** - Where segments of creeks are crossed and possibly realigned, they may not have the same canopy cover/shade as before the project. The bridge crossings will provide permanent shade to the waterway. .

Paved surfaces in Caltrans right-of-way are less than 1% of the watershed. Therefore, it is not anticipated that increases in runoff temperatures from paved areas would lead to a measurable increase in stream temperatures and less than significant under CEQA.

4.6.10 Summary of Effects on Water Quality

Each of the alternatives will affect the water temperature and toxicity to varying degrees. The "No Build" alternative had the least effect, the AAC2 and A5C1 alternatives the next greatest effect and the D1 and D13 alternatives (including the preferred alternative), have the most effect. The magnitude of the increase in water temperature and toxicity from the bypass project is relatively small when comparing the impervious surface area of each alternative to the size of the watershed. The geographic extent of the effects is relatively small. The watersheds involved are a small segment of the Sacramento River Basin, approximately 0.5%.

The duration and frequency of the effect varies. During the first major rainfall, the toxic nature of the water is higher than any other time and the water quality objectives may be exceeded. Throughout the rest of the rainy season, the pollutant level is much lower, in most cases lower than the water quality objective. Monitoring of the water constituents would be necessary to determine when water quality objectives would be exceeded.

Water temperature would fluctuate throughout the rainy season. Whenever rain would wash into the waterways from impervious surfaces, the temperature would be higher than if it had washed from vegetated surfaces.

During construction, Caltrans Best Management Practices for Control of Water Pollution (Transportation Projects) will be implemented to minimize sedimentation. Temporary increases in sedimentation during construction are expected to be minimal.

Storm water runoff from the proposed roadway will be collected and routed into water treatment systems before discharging into drainages in the project area. The amount of pollutants discharged with storm water runoff will be minimized.

The city's monitoring program could be an effective evaluative mechanism for managing development and avoidance and minimization measures in order to maintain water quality objectives for the receiving waters. If monitoring indicated that the water exceeded toxic water quality objectives, then additional mechanisms could be instituted to limit the amount of toxic loading that enters the waterways.

4.7 FLOODPLAIN

The proposed roadway typical cross-section will be designed to provide for an all-weather route to ensure safe passage of emergency vehicles and serve as an emergency evacuation route. The minimum roadway profile grade elevation will be 1.43 m (4.7 ft) above the existing ground elevation. This profile grade will ensure that the proposed bypass will be above existing ground and provide coverage for future drainage features. At the low points, the profile will be elevated to be at least 0.9m (3 ft) above the 100-year flood level.

In general, the proposed floodplain crossings listed in Table 3-21 in Chapter 3, will include bridges over the floodway or mainstream channel. Cross culverts will be provided through any embankment within the floodplain overbank area / floodway fringe to minimize the impacts of bridge approach embankment fills within the floodplain boundaries.

The vegetation and soils along the various proposed waterway crossings are similar in nature. The erosion hazard of the soils varies from slight erosion hazard in the floodway fringes to high erosion hazard in the recent alluvium deposits adjacent to stream channels. The availability of detailed soil information will ensure that appropriate erosion control measures are included to mitigate the floodplain encroachments.

Storm water detention measures are being provided to minimize increases to the peak flows resulting from the proposed roadway construction per discussions with the Placer County Flood Control Engineer. As a detention measure, roadside ditches would be designed to provide storm runoff detention. The project will not increase downstream velocity or peak flow. The project will increase the volume of flow within the project limits due to the impervious surfaces, but should have a negligible effect on downstream

flow. Post construction flows will be kept at pre-construction conditions by detaining the flow as it drains towards their original waterway destinations either by ditches or by detention basins. Preliminary plans include detention basins at the projects' north end near Riosa Road. The paved roadway area design has been reduced to the maximum extent possible thus minimizing the amount of runoff from impervious surfaces. Earthen conveyance systems have been conceptually developed with relatively flat slopes. Consequently, velocities are expected to be very low during a 25-year design storm. Most of the watersheds share the same directional flow, i.e. flow from east to west. The proposed project's orientation is predominately north south therefore impeding most of this flow. The ditches, designed to run parallel to the highway, will return this intercepted flow to its original waterway destination thus preserving the area's natural drainage. The earthen ditches shall be vegetated and discharge into natural streams and creeks that the project traverses. Existing cross drains located at the proposed project's northern limits will be incorporated into the drainage design concepts. These cross drains are designed as siphon systems and run under the South Sutter Water District Aqueduct.

Sediment loading is considered minimal given the flattened slopes and the slope re-vegetation included as permanent BMPs. Culverts shall be fitted with Flared End Sections (FES) to facilitate grading and maintenance. Although drainage velocities are low in the longitudinal ditches, Rock Energy Dissipaters (REDs) will be provided at the outlets to retard the peak flow into local waterways and to prevent potential scour in flood conditions. Additionally, the proposed bridges will be designed to minimize downstream impacts.

To establish the estimated 100-year Base Floodplain Elevation (BFE), the Flood Insurance Rate Map Zone A floodplain boundaries were superimposed onto a USGS topographic map and the contour elevation was interpolated. The estimated 100-year BFE for the riverine flooding typical to this study is adjusted by one-half the contour interval to account for any elevation difference between the left overbank boundaries and the right overbank boundaries.

Alternative AAC2

This project alignment conforms to the existing SR 65 alignment approximately 0.5 km (0.3 mi) south of Industrial Avenue. There is no anticipated encroachment by this project onto the floodplain at the north tributary of **Orchard Creek**.

Alternative AAC2 crosses **Ingram Slough** approximately 915 m (3,000 ft) west of the existing SR 65. Ingram Slough is not designated as a 100-year floodplain. The City of Lincoln is currently constructing a new bridge on SR 65 at Ingram Slough. The bridge on the existing highway alignment will have a length of 42 m (138 ft). Additionally, the

Union Pacific Railroad is constructing a 40 m (130 ft) trestle immediately west of the existing highway alignment. The November 10, 1999 Hydraulic Evaluation for Advance Planning Study (HEAPS) by the Department's Division of Structures noted that the South Lincoln Master Drainage Plan proposes to split Ingram Slough into two reaches just west of the existing SR 65 alignment. The existing Ingram Slough channel would be abandoned.

The bridge for the south reach of the realigned Ingram Slough will be designed to clear the railroad tracks, the south reach channel and a maintenance roadway. The profile grade over the channel will be approximately 51 m (170 ft). The HEAPS estimates the 100-year BFE at 41 m (135 ft).

The north reach of the realigned Ingram Slough is at a 60-degree skew to the Lincoln Bypass alignment and would require a 91 m (300 ft) long bridge. The proposed profile grade elevation is 44 m (144 ft) compared to an estimated 100-year BFE of 42 m (137 ft).

Alignment AAC2 encroaches on the 100-year floodplain at **Auburn Ravine** in the vicinity of Moore Road for a distance of 320 m (1,050 ft). The floodplain at this location is designated Zone A with no base flood elevations determined. The HEAPS estimates a 100-year BFE of 39 m (128 ft) at the alignment AA crossing. The HEAPS for Auburn Ravine Bridge proposes bridge length of 213.4 m (700 ft). The structure would span Auburn Ravine from bank to bank with a minimum soffit elevation of 39.9 m (131 ft). This elevation would provide 0.9 m (3 ft) of freeboard, as required by the Reclamation Board, over the estimated 100-year BFE of 39 m (128 ft).

Alignment AAC2 encroaches on the 100-year floodplain at the Lower Tributary of **Markham Ravine** in a location approximately 550 m (1,800 ft) south of Nicolaus Road for a distance of 75 m (250 ft). The floodplain at this location is designated Zone AE Floodway, base flood elevations determined. The BFE at this crossing is 38.7 m (127 ft). The designated floodway for the AAC2 crossing at the Lower Tributary of Markham Ravine encompasses the entire width of the Zone AE floodplain boundaries. Any fill encroachment within the floodway would likely result in a greater than 0.3 m (1 ft) increase to the BFE. Additional studies are required if this alignment alternative is selected. Alignment AAC2 encroaches on the 100-year floodplain at Markham Ravine again approximately 335 m (1,100 ft) north of Nicolaus Road for a distance of 21 m (70 ft). The floodplain at this location is designated Zone AE Floodway. The 100-year BFE at this proposed AAC2 crossing is 37.9 m (124.5 ft). The HEAPS proposes a bridge length of 85.3 m (280 ft) for the alignment AAC2 crossing of Markham Ravine. The proposed soffit elevation is 0.9 m (3 ft) or greater than the 100-year BFE.

Alignment AAC2 encroaches on the **Coon Creek** floodplain approximately 550 m (1,800 ft) north of Wise Road for a distance of 640 m (2,100 ft). The floodplain at this location is designated Zone A. The estimated 100-year BFE is 32 m (105 ft) according to the HEAPS. The HEAPS proposes a bridge length of 76m (250 ft) at the C2 alignment crossing.

Alignment AAC2 encroaches on the **Yankee Slough** floodplain in the vicinity of Dowd Road for approximately 213 m (700 ft). The floodplain at this location is designated Zone A. The HEAPS for this alignment recommends a bridge length of 61 m (200 ft) and a minimum soffit elevation of 29 m (95 ft).

It was recommended that the proposed interchange for the Dowd Road / Dalby Road connection be located north of the existing County road intersection to minimize encroachments into the Yankee Slough 100-year floodplain.

Alignment AAC2 crosses an existing **irrigation aqueduct** approximately 488 m (1,60 ft) south of Riosa Road. The aqueduct is the jurisdiction of South Sutter Water District. A review of the proposed crossing by the District Hydraulics Branch in 1994 concluded that a double 3.7 m by 2.1 m (12 x 7 ft) reinforced concrete box culvert would have been required at the aqueduct crossing location.

Alternative A5C1

Alignment A5C1 crosses **Ingram Slough** at a location approximately 915 m (3,000 ft) west of the existing SR 65. Please see the description for the Alignment AAC2 crossing of Ingram Slough as all proposed alignments cross Ingram Slough in close proximity to that alignment.

Alignment A5C1 encroaches on the 100-year floodplain at **Auburn Ravine** in the vicinity of Moore Road for a distance of 305 m (1,000 ft). The floodplain at this location is designated Zone A. The HEAPS for Auburn Ravine Bridge proposes a bridge length of 213 m (700 ft). The structure would have spanned Auburn Ravine from bank to bank with a minimum soffit elevation of 40 m (131 ft). This elevation would provide 0.9 m (3 ft) of freeboard, as required by the Reclamation Board, over the estimated 100-year BFE of 39 m (128 ft).

Alignment A5C1 encroaches on the 100-year floodplain at the **Lower Tributary of Markham Ravine** at a location approximately 490 m (1,600 ft) south of Nicolaus Road for a distance of 183 m (600 ft). The floodplain at this location is designated Zone AE, base flood elevations determined. A HEAPS bridge length estimate is not available for this location. The designated floodway for the A5C1 crossing at the Lower Tributary of Markham Ravine encompasses the entire width of the Zone AE floodplain boundaries.

Any fill encroachment within the floodway would likely result in a greater than 0.3 meter (1 ft) increase to the 100-year BFE.

Alignment A5C1 encroaches on the 100-year floodplain at the **main channel of Markham Ravine** approximately 427 m (1,400 ft) north of Nicolaus Road for 122 m (400 ft). The floodplain at this location is designated Zone AE. The HEAPS proposes a bridge length of 85.3 m (280 ft) at the A5 crossing. The profile grade should be set to allow for minimum freeboard of 0.9 m (3 ft).

Alignment A5C1 encroaches on the **Coon Creek** floodplain approximately 518 m (1,700 ft) north of Wise Road for a distance of 884 m (2,900 ft). The floodplain at this location is designated Zone A. A HEAPS bridge length estimate is not available for the A5C1 crossing location. The adjacent AAC2 crossing 244 m (800 ft) upstream proposes a bridge length of 76.2 m (250 ft). The HEAPS notes that the peak discharge of 594 cubic meters per second (m^3/s) may not reach this crossing location due to upstream constriction at the existing highway and railroad crossings.

Alignment A5C1 crosses the **Yankee Slough** floodplain at two locations. The alignment encroaches on Yankee Slough approximately 914 m (3,000 ft) south of Dalby Road for a distance of 152 m (500 ft) and again approximately 213 m (700 ft) south of Dalby Road for a distance of 107 m (350 ft). The floodplain at these locations is designated Zone A. A detailed FEMA Flood Insurance Study is not available for Yankee Slough. The estimated 100-year BFE is 27 m (88 ft). A HEAPS bridge length estimate is not available for these crossing locations. The adjacent AAC2 alignment, crossing approximately 274 m (900 ft) upstream of the A5C1 alignment, proposes a bridge length of 61 m (200 ft) for the northerly third of Yankee Slough. If the A5C1 alignment had been selected, additional studies would have been required to determine a bridge length for the southerly crossing of Yankee Slough.

Alignment A5C1 crosses an existing **irrigation aqueduct** approximately 549 m (1,800 ft) south of Riosa Road. The aqueduct is the jurisdiction of South Sutter Water District. A review of the proposed crossing by the District Hydraulics Branch in 1994 concluded that a double 3.7 m by 2.1 m (12 ft x 7 ft) reinforced concrete box culvert would have been required at the aqueduct crossing location.

Alternative D1

Alignment D1 crosses **Ingram Slough** at a location approximately 915 m (3,000 ft) west of the existing SR 65.

Alignment D1 encroaches on the 100-year floodplain at **Auburn Ravine** approximately 792 m (2,600 ft) north of Moore Road for a distance of 396 m (1,300 ft). The floodplain at this location is designated Zone A. The Flood Insurance Study (FIS)

for Auburn Ravine does not include this crossing location. The November 10, 1999 HEAPS does not include recommendations for the D1 alignment crossing of Auburn Ravine, however, the A5C1 and AAC2 alignments, approximately 610 m (2,000 ft) upstream of D1, call for a bridge length of 213.4 m (700 ft). The Reclamation Board requires 0.9 m (3 ft) of freeboard between the 100-year BFE and the bridge soffit.

Alignment D1 encroaches on the 100-year floodplain at **Markham Ravine** in three locations. The floodplain at these locations is designated Zone A. A detailed FIS is not available for this portion of Markham Ravine. Two of the floodplain encroachments occur on the branches of a reservoir within the Markham Ravine watershed. The estimated 100-year BFE at these crossings is 35.8 m (117.5 ft). The third floodplain encroachment is located approximately 548 m (1,800 ft) south of Nicolaus Road for a distance of 122 m (400 ft) across the mainstream channel. The estimated 100-year BFE is 34.3 m (112.5 ft) at the D1 crossing of the mainstream channel. The HEAPS recommendation for the adjacent D13 alignment estimates the bridge length at 129.5 m (425 ft). The HEAPS notes that additional survey data would be required to determine backwater effects.

Alignment D1 encroaches on the 100-year floodplain at **Coon Creek** in the vicinity of Wise Road for a distance of 1,128 m (3,700 ft). The floodplain at this location is designated Zone A. The estimated 100-year BFE of 32.7 m (107.3 ft) per the HEAPS is based on an estimated flow of 594.3 m^3/s (21,000 cfs). According to the Placer County Flood Control Engineer, the estimated peak discharge for a 100-year event ranges from 311.3 m^3/s (11,000 cfs) to 594.3 m^3/s (21,000 cfs) for ultimate build-out of the upstream watershed area. The D1 and D13 alignments cross Coon Creek at the same location. The APS proposes a bridge length of 91.4 m (300 ft) at this crossing. The HEAPS notes that the peak discharge of 594 m^3/s may not reach the D1 crossing location due to upstream constriction at the existing highway and railroad crossings.

Alignment D1 encroaches on the 100-year floodplain at **Yankee Slough** near the Dalby Road / Dowd Road intersection for a distance of 213 m (700 ft). The floodplain at this location is designated Zone A. The estimated 100-year BFE is 28.0 m (92 ft). Alignments D1 and D13 cross Yankee Slough at the same location. The APS proposes a bridge length of 61.0 m (200 ft) and a minimum soffit elevation of 29.0 m (95 ft). It was recommended that the proposed interchange for the Dowd Road / Dalby Road connections should be located north of the existing County road intersection to minimize encroachments into the Yankee Slough 100-year floodplain.

Alignment D1 crosses **Big Yankee Slough** near the Dalby Road Dowd Road intersection. This crossing is not within the designated floodplain boundaries. The estimated 100-year water surface elevation is 28.0 m (92 ft). Alignments D1 and D13

cross Big Yankee Slough at the same location. The HEAPS proposed a bridge length of 30.5 m (100 ft) and a minimum soffit elevation of 29 m (95 ft).

Alignment D1 crosses an existing **irrigation aqueduct** approximately 549 m (1,800 ft) south of Riosa Road. The aqueduct is the jurisdiction of South Sutter Water District. A review of the proposed crossing by the District Hydraulics Branch in 1994 concluded that a double 3.7 m by 2.1 m (12 ft x 7 ft) reinforced concrete box culvert would have been required at the aqueduct crossing location.

Alternative D13 and the D 13 North Modified

The D 13 North Modified has the same floodplain encroachments as the D 13 alternative.

Proposed alignment D13 crosses **Ingram Slough** approximately 915 m (3000 ft) west of the existing SR 65. Please see the description for the Alternative alignment AA crossing of Ingram Slough as all proposed alignments cross Ingram Slough in close proximity to alignment AA.

Alignment D13 encroaches on the 100-year floodplain at **Auburn Ravine** in the vicinity of Moore Road for a distance of 305 m (1,000 ft). The floodplain at this location is designated Zone A. The HEAPS estimates a 100-year BFE of 39 m (128 ft) at the D13 alignment crossing. The HEAPS proposes a bridge length of 158.5 m (520 ft) and a minimum soffit elevation of 31.7 m (104 ft)

Alignment D13 encroaches on the 100-year floodplain at **Markham Ravin**e approximately 914 m (3,000 ft) south of Nicolaus Road for a distance of 91.4 m (300 ft). The floodplain at this location is designated Zone A. The estimated 100-year BFE is 30.8 m (101 ft). The HEAPS proposes a bridge length of 129.5 m (425 ft) and a minimum soffit elevation of 31.7 m (104 ft). The HEAPS advised that additional survey data would be required at Markham Ravine to determine backwater effects. The bridge length could be reduced based on additional studies.

Alignment D13 joins alignment D1 at a location approximately 2,286 m (7,500 ft) south of Wise Road. Please see the D1 alignment descriptions for floodplain encroachment and waterway crossing information north of the D1/D13 convergence.

4.7.1 Summary of Floodplain

Table 4-17 is a summary of the 100-year floodplain encroachment lengths. Figure 4-2 shows the location of these encroachments. The encroachments listed for D13 apply to all the D13 Modified alignments including the Preferred Alternative, D13 North Modified.

Table 4-17 Summary of 100 year Floodplain Encroachment Lengths

Alignment	Auburn Ravine	Markham Ravine	Markham Ravine Lower Tributary	Coon Creek	Yankee Slough
AAC2	320 m *(1050 ft)*	21 m *(70 ft)*	75 m *(250 ft)*	640 m *(2100 ft)*	213 m *(700 ft)*
A5C1	305 m *(1000 ft)*	122 m *(400 ft)*	183 m *(600 ft)*	884 m *(2900 ft)*	152 m *(500 ft)*
D1	396 m *(1300 ft)*	91 m, 61 m, &122m[1] *(300 ft, 200 ft & 400 ft)*	NA	1128 m *(3700 ft)*	213 m *(700 ft)*
D13	305 m *(1000 ft)*	91 m *(300 ft)*	NA	1128 m *(3700 ft)*	213 m *(700 ft)*

[1] Crosses at three locations
Source: Location Hydraulic Study Update (1999)

Alignment D13, with minimization measures, appears to have a low potential for impacts due to floodplain encroachments. The backwater analysis by Caltrans Structures Hydraulics indicates negligible increases to the floodplain base flood elevation at the proposed floodplain crossings. 900 mm equalizer culverts are recommended for the proposed roadway, within the floodplain limits at Coon Creek to minimize any loss of floodplain storage at this location. Equalizer culverts may be placed where terrain permits to reduce the duration and extent of storm water ponding.

With project features such as the bridges shown in Figure 4-2, following the recommended bridge lengths and soffits, and including flood basins as a feature of the project, overall floodplain encroachment would be minimal. Floodplain easements in the vicinity of Wise Road and the proposed project will also alleviate some potential flooding by providing storage for floodwaters during extreme events.

Figure 4-2 Location of Bridges

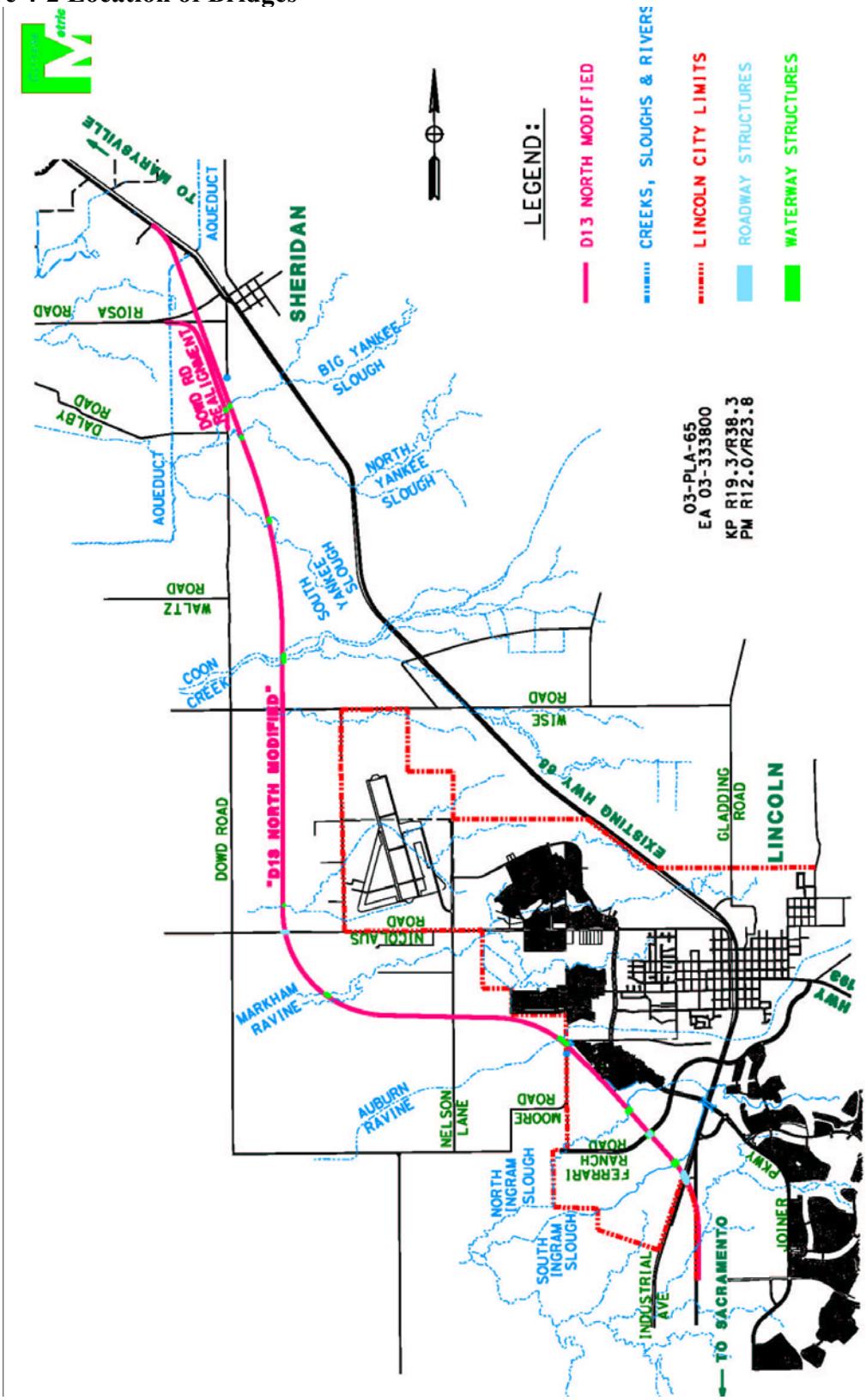
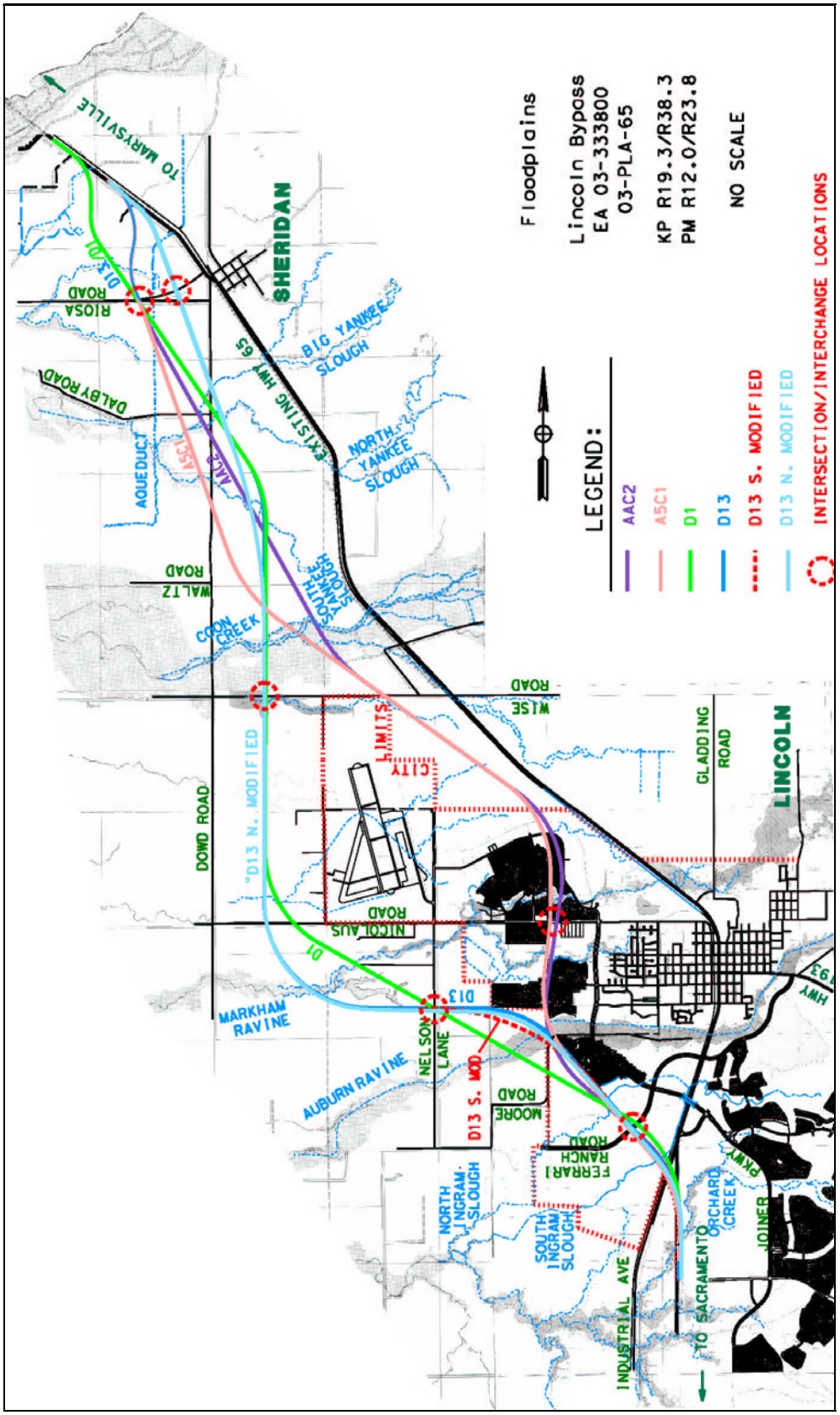


Figure 4-3 Flood Boundary Map



4.8 NATURAL RESOURCES

This section discusses and compares the impacts to biological resources and wetlands that are expected to occur as a result of the proposed project. All impact determinations are based on 76 m (250 ft) wide alignments, except where the development has occurred within this impact area.

For the Draft EIR/S, the measurement of impacts was based upon preliminary highway design. This allowed an equivalent comparison of alternatives without expending too much time refining design for all of the alternatives. Since the LEDPA has been concurred upon, additional design of the LEDPA alternative has occurred, and FWS guidelines on measuring impacts has been applied. Because more design has occurred and these guidelines have been applied to the LEDPA and not the other alternatives, the numbers for the LEDPA can no longer be compared with the numbers for the other alternatives.

Impacts have increased for the preferred alternative, however, those increases would have occurred for all the alternatives if the same design criteria were applied to the other alternatives. These increases in impacts are shown in Section 4.8.7. For the tables that compare alternatives, the impacts to the preferred alternative have not been altered to reflect new design elevation.

After analysis of the range of alternatives, the preferred alternative was approved as the LEDPA (D13 North Modified) and its impacts updated. A Biological Assessment documenting these specific impacts has been prepared and was used for Section 7 consultation with the U.S. Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration (NOAA) under the Federal Endangered Species Act and coordination with California Dept. of Fish and Game (CDFG) as necessary under the California Endangered Species Act. The Biological Opinion (BO) was issued on February 2, 2005. A request to modify the BO was sent to the FWS in January 2006 and they sent back an amendment to the BO on March 21, 2006.

To initiate the studies, an annotated list of special status plant and wildlife species potentially occurring within the project area was compiled. The list was generated by querying the California Natural Diversity Data Base (CNDDB 1998 and 2003) and California Native Plant Society Electronic Inventory (CNPS) for the Sheridan, Lincoln, Pleasant Grove and Roseville quadrangles, and by obtaining a FWS list of special status species potentially occurring in the project area. Species lists generated through this process are included in Chapter 7, Comments and Coordination. Personnel from FHWA, Caltrans, FWS, NOAA and CDFG were contacted to discuss potential species-related

issues and to review/coordinate survey efforts. Agency staff contacted and the issues discussed are listed in Chapter 7, Comments and Coordination.

Park and Ride

A Park and Ride facility has been proposed for all the alignments as a part of this project. The park and ride facility will be located within the proposed right-of-way of the alignment adjacent to Industrial Avenue and SR 65 intersection. In the initial analysis, braided ramps were included in the park and ride location and the impact footprint was substantially larger due to the braided ramps and the number of parking spaces in the park and ride lot. The braided ramps are no longer a part of this project and the park and ride lot has been reduced; therefore the impacts would have also been reduced substantially if separated out. Originally the park and ride lot was designed to accommodate approximately 1200 cars; however, the footprint for the park and ride has decreased to approximately 6 acres and will accommodate less than the original 1200 cars. The location of the Park and Ride is shown in Figure 2.4.

The footprint for the park and ride facility will be purchased at the time of acquisition for the selected alternative. The proposed park and ride lot will not be constructed until the demand necessitates it and funding is available. The impacts for the park and ride lot have been incorporated into the impacts for the D13 North Modified.

4.8.1 Regulatory Requirements

This section summarizes the responsibilities of key agencies involved in the review of the Natural Environment Study Report (NESR) and related project documents. Coordination with the agencies is also discussed. Copies of correspondence with the agencies are included in Appendix D and E.

U.S. Environmental Protection Agency (EPA)

EPA has primary responsibility for administration of the Clean Water Act and has oversight authority on 404 permitting issues. EPA has concurred with the project purpose and need and the range of alternatives to be evaluated. EPA provided written agreement that the preferred alternative is the LEDPA on July 9, 2003, and provided a preliminary concurrence on the Mitigation and Monitoring Plan on December 12, 2004.

U.S. Army Corps of Engineers (USACE)

The USACE is a signatory agency under the NEPA/404 Memorandum of Understanding (MOU) and has concurred with the projects purpose and need and the range of alternatives. Under Section 404 of the Clean Water Act, the USACE regulates the discharge of dredged or fill material into waters of the U.S. A Section 404 permit will be required authorizing the discharge of dredged or fill material associated with roadway construction into vernal pools and other wetlands and regulated waters.

The USACE verified the original wetland delineation for the Study Area in 1991, and has provided direction on updating the delineation and re-verifying the findings. A meeting was held with USACE personnel on March 10, 1998 (Cavanaugh, March 10, 1998) to discuss the possibility of delaying the update and re-verification of wetlands until a preferred alternative was chosen. It was agreed that that approach would be acceptable.

USACE concurred with the LEDPA on August 8, 2003 during the NEPA/404 process and has given concurrence on the Draft Habitat Mitigation and Monitoring Plan (HMMP) on December 27, 2004. Caltrans sent a revised Wetland Delineation to USACE in March 2004 for re-verification. The 404 permit was also submitted to USACE in March for review and comment. Caltrans will need to obtain concurrence on the final HMMP as well as a re-verification of the Wetland Delineation before USACE will issue a permit for the project.

U.S. Fish and Wildlife Service (FWS)

Under the Fish and Wildlife Coordination Act of 1958, Federal agencies are required to coordinate during project planning stages with the FWS and with the State agency responsible for fish and wildlife resources on activities that modify any body of water. Under Section 7 of the Federal Endangered Species Act, Federal agencies are required to consult with FWS on any action that "may affect" a Federally listed threatened or endangered species or designated critical habitat. FWS is also a signatory agency to the NEPA/404 Integration MOU and has concurred with the purpose and need and the range of alternatives evaluated for the project.

FWS will continue to be involved in the project through review of environmental documents, participation in the 404 permitting process and in Section 7 consultation for potential project effects on listed species.

In February 2004, Caltrans began discussing the project and the Section 7 consultation with FWS. During the next several months Caltrans, FHWA and FWS worked towards satisfying the requirements of the Section 7 consultation process. FWS issued a BO on February 2, 2005 (Appendix J). The BO states that the project as described will not jeopardize the continued existence of those species that are impacted by the project. A request to modify the BO was sent to the FWS in January 2006. They sent an amended BO on March 21, 2006.

National Oceanic and Atmospheric Administration (NOAA Fisheries)

Under Section 7 of the Federal Endangered Species Act, Federal agencies are required to consult with NOAA Fisheries on any action that "may affect" a Federally listed threatened or endangered species or designated critical habitat for which NOAA

has responsibility. For this project, NOAA Fisheries has responsibility for reviewing project effects to anadromous fish.

Caltrans submitted a request for Section 7 consultation with NOAA in May of 2004, concurrence on the "not likely to adversely affect" determination on Central Valley Steelhead and Essential Fish Habitat for Pacific Salmon (May 19, 2004) was obtained.

California Regional Water Quality Control Board (RWQCB)

A Section 401 Water Quality Certification from the Regional Water Quality Control Board is required in conjunction with the Section 404 permitting process. A 401 Certification will be required before the 404 permit is issued. Application to the RWQCB is generally made after the environmental document is complete.

California Department Of Fish and Game (CDFG)

Coordination with CDFG will be necessary under the Fish and Wildlife Coordination Act and under the California Endangered Species Act for potential impacts to State listed species. In addition, a Section 1602 Agreement will be required from CDFG to authorize work in streams and other waterbodies. CDFG have also been involved in the review of project environmental documents and in the 404 permitting process as a reviewing agency on the USACE's public notice.

Executive Order 11990 Protection of Wetland (May 24, 1977)

On federally funded projects, impacts on wetlands must be identified in the environmental document. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific "Wetlands Only Practicable Alternative Finding" in the Final Environmental Document. It can be found in Section 4.8.10 of this document.

4.8.2 Impacts to Plant Communities

The potential impacts to plant communities within each alternative are presented in Table 4-18. Figure 3-14 in Chapter 3 shows the plant communities along with the project footprint. The total area of each community type within the project Study Area is also provided for perspective. This information is presented graphically in a bar chart in Figure 4-4.

Figure 4-4 Comparison of Potential Impacts to Key Resources

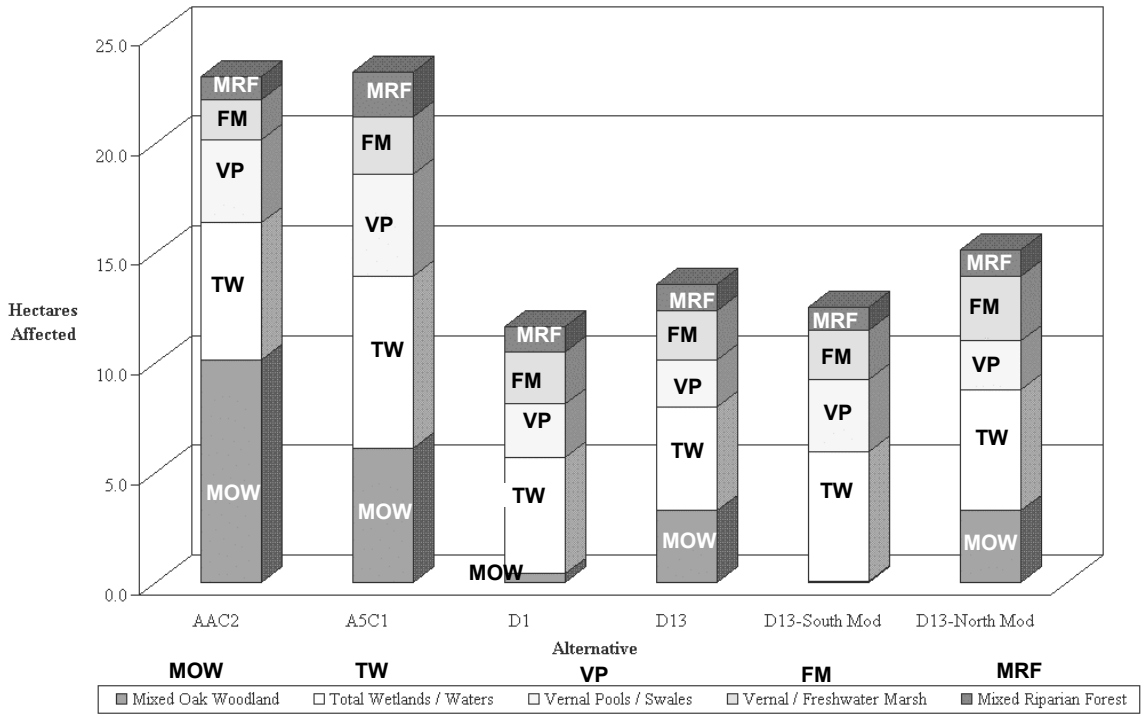


Table 4-18 Potential Impacts to Plant Communities Occurring in the Study Area

Community	Total Within Study Area	A5C1	AAC2	D1
Developed/Disturbed	176.93 ha	30.72 ha	23.43 ha	14.89 ha
	437.2 ac	*75.9 ac*	*57.9 ac*	*36.8 ac*
	8.5 %	15.1%	11.9%	7.6%
Agricultural Lands	873.99 ha	52.17 ha	51.11 ha	81.67 ha
	2159.6 ac	*128.9 ac*	*126.3 ac*	*201.8 ac*
	42.2 %	25.7%	26.1%	41.7%
Non-native Grassland	211.42 ha	14.97 ha	19.83 ha	18.86 ha
	522.4 ac	*37 ac*	*49.0 ac*	*46.6 ac*
	10.2 %	7.4%	10.1%	9.6%
Mixed Oak Woodland	49.37 ha	6.11 ha	10.16 ha	0.40 ha
	122.0 ac	*15.1 ac*	*25.1 ac*	*1.0 ac*
	2.4 %	3.0%	5.2%	0.2%
Mixed Riparian Forest	17.85 ha	2.06 ha	1.05 ha	1.3 ha
	44.1 ac	*5.1 ac*	*2.6 ac*	*2.8 ac*
	0.9 %	1.0%	0.5%	0.6%
Valley Freshwater Marsh	61.47 ha	2.23 ha	1.34 ha	2.06 ha
	151.9 ac	*5.5 ac*	*3.3 ac*	*5.1 ac*
	3.0 %	1.1%	0.7%	1.1%
Great Valley Willow Scrub	1.9 ha	0.08 ha	0.08 ha	0.12 ha
	4.7 ac	*0.2 ac*	*0.2 ac*	*0.3 ac*
	0.1 %	0.0%	0.0%	0.1%

Community	Total Within Study Area	A5C1	AAC2	D1
Grassland / Northern Hardpan Vernal Pool Complex	646.43 ha	90.73 ha	85.67 ha	73.82 ha
	1597.3 ac	*224.2 ac*	*211.7 ac*	*182.4 ac*
	31.2 %	44.7	43.7%	37.7%
Grassland/Northern Volcanic Mudflow Vernal Pool Complex	11.9 ha	2.95 ha	2.51 ha	2.19 ha
	29.4 ac	*7.3 ac*	*6.2 ac*	*5.4 ac*
	0.6 %	1.5%	1.3%	1.1%
Vernal Marsh	10.32 ha	0.36 ha	0.49 ha	0.32 ha
	25.5 ac	*.9 ac*	*1.2 ac*	*0.8 ac*
	0.5 %	0.2%	0.2%	0.2%
Open Water	11.33 ha	0.53 ha	0.53 ha	0.32 ha
	28.0 ac	*1.3 ac*	*1.3 ac*	*0.8 ac*
	0.5 %	0.3%	0.3%	0.2%
Total	**2072.91 ha**	**202.92 ha**	**196.20 ha**	**195.79 ha**
	5122.1 ac	***501.4 ac***	***484.8 ac***	***483.8 ac***
	100.0 %	**100.0%**	**100.0%**	**100.0%**

Community	Total Within Study Area	D13	D13 – Modified South	D13 - Modified North
Developed/ Disturbed	176.93 ha	16.27 ha	18.29 ha	18.78 ha
	437.2 ac	*40.2 ac*	*45.2 ac*	*46.4 ac*
	8.5 %	7.6%	8.7%	**8.7%**
Agricultural Lands	873.99 ha	102.11 ha	92.84 ha	94.74 ha
	2159.6 ac	*252.3 ac*	*229.4 ac*	*234.1 ac*
	42.2 %	47.7%	44.1%	**44.1%**
Non-native Grassland	211.42 ha	18.41 ha	18.74 ha	12.42 ha
	522.4 ac	*45.5 ac*	*46.3 ac*	*30.7 ac*
	10.2 %	8.6%	8.9%	**5.8%**
Mixed Oak Woodland	49.37 ha	3.28 ha	0.08 ha	3.28 ha
	122.0 ac	*8.1 ac*	*0.2 ac*	*8.1 ac*
	2.4 %	1.5%	0.0%	**1.5 %**
Mixed Riparian Forest	17.85 ha	1.21 ha	1.05 ha	1.21 ha
	44.1 ac	*3.0 ac*	*2.6 ac*	*3.0 ac*
	0.9 %	0.6%	0.5%	**0.6 %**
Valley Freshwater Marsh	61.47 ha	2.06 ha	2.06 ha	1.98 ha
	151.9 ac	*5.1 ac*	*5.1 ac*	*4.9 ac*
	3.0 %	1.0%	1.0%	**0.9 %**
Great Valley Willow Scrub	1.9 ha	0.08 ha	0.08 ha	0.08 ha
	4.7 ac	*0.2 ac*	*0.2 ac*	*0.2 ac*
	0.1 %	0.0%	0.0%	**0.0%**
Grassland / Northern Hardpan Vernal Pool Complex	646.43 ha	67.18 ha	73.78 ha	78.11 ha
	1597.3 ac	*166 ac*	*182.3 ac*	*193.0 ac*
	31.2 %	31.4%	35.1%	**36.4 %**

Community	Total Within Study Area	D13	D13 – Modified South	D13 - Modified North
Grassland/Northern Volcanic Mudflow Vernal Pool Complex	11.9 ha	2.87 ha	2.87 ha	2.87 ha
	29.4 ac	*7.1 ac*	*7.1 ac*	*7.1 ac*
	0.6 %	1.3%	1.4%	**1.3%**
Vernal Marsh	10.32 ha	0.16 ha	0.16 ha	0.97 ha
	25.5 ac	*0.4 ac*	*0.4 ac*	*2.4 ac*
	0.5 %	0.1%	0.1%	**0.5 %**
Open Water	11.33 ha	0.24 ha	0.32 ha	0.24 ha
	28.0 ac	*0.6 ac*	*0.8 ac*	*0.6 ac*
	0.5 %	0.1%	0.2%	**0.1%**
Total	2072.91 ha	213.88 ha	210.28 ha	214.69 ha
	5122.1 ac	*528.5 ac*	*519.6 ac*	*530.5 ac*

The project may have direct and indirect impacts on special status species and their habitats. Direct effects are defined by the Presidents Council on Environmental Quality (CEQ) as those effects that are caused by the project or action and occur at the same time and place as the project or action. Indirect effects are caused by the project or action, but occur later in time or are farther removed in distance, but still foreseeable.

Direct effects of this project may include the permanent removal of vegetation and associated wildlife within the construction footprint, as well as temporary effects resulting from construction access and staging. Indirect effects include changes in hydrology (flooding or de-watering), shading (under bridges or adjacent to large fills), increased disturbance and noise, introduction of exotic species, etc. Except for altered hydrology, the potential for indirect effects is generally limited to the area directly adjacent to the new roadway.

Provisions will be made in the project design to allow passage through the project area all critical natural drainage features. Consequently, project effects due to altered hydrology will be minimal except, perhaps, in the direct vicinity of the project footprint.

As shown in Table 4-18, the greatest impacts, regardless of the alternative alignment, are to agricultural lands and annual grassland, with and without vernal pools. These are the most common communities in the project area. The western alignments (D1, D13, D13 South Modified and D13 North Modified) have a proportionately greater impact on agricultural lands, while the eastern alignments (A5C1 and AAC2) have a proportionately greater impact on vernal pool habitats. All alternatives would impact wildlife associated with the affected plant communities. Agricultural land and non-native grasslands (both with and without vernal pools) are the most common habitats, and the extent of wildlife impacts is directly related to the acreage of these habitats affected by each alternative. While there is much less acreage of mixed oak woodland, mixed

riparian forest and valley freshwater marsh within the Study Area, these communities provide higher quality wildlife habitat, generally due to the availability of water and/or greater structural diversity. Further, the more limited extent of these habitats in the Study Area amplifies the importance of project impacts to these habitats. Consequently, impacts to these high quality communities are generally considered more likely to have impacts to wildlife.

Disturbance to wildlife habitat will likely disrupt intra- and inter-specific wildlife interactions, particularly to the less mobile amphibians, reptiles and small mammals. During the initial phases of construction, these less mobile wildlife species may be killed outright, while more mobile species such as birds and larger mammals will be displaced into adjacent habitat that is likely currently occupied, resulting in increased competition and predation pressures on the newly displaced individuals as well as those already present in the habitat. These interactions could lead to increased stress, which in turn could lead to reduced reproduction.

4.8.3 Wildlife Corridors

Although the riparian communities, particularly along Auburn Ravine and Coon Creek, provide relatively unobstructed wildlife corridors through the Study Area, these corridors are crossed by existing SR 65, the UPTC tracks, and a number of secondary roads and farm roads. Existing SR 65 is immediately adjacent to the UPTC tracks through most of the Study Area, and the main drainage (Auburn Ravine, Markham Ravine, Coon Creek) are conveyed through culverts beneath these features. These culverts have a combined length of up to 61 m (200 ft). Consequently, the SR 65/ UPTC tracks represent an existing hindrance to wildlife movement along the east side of the Study Area.

The new freeway corridor, which will be constructed on a raised road prism, will impede local wildlife movements for several species of amphibians, reptiles and mammals. Movement by smaller, less mobile species may be blocked by the roadway, possibly limiting the availability of resources and hindering dispersal and genetic exchange within populations. More mobile species (e.g., lizards, snakes, skunks, raccoons, ground squirrels, coyotes) may incur increased mortality by attempting to cross the freeway. Culverts will be provided at drainage locations and may provide crossings for wildlife, but are not expected to completely avoid the potential impacts to wildlife movements. However, further consideration regarding culvert characteristics and sizes conducive to wildlife movements will be done as design is finalized. Where feasible, design will incorporate elements that would alleviate wildlife crossing impacts but that do not jeopardize the integrity of the project design.

A5C1 and AAC2 Alignments

These alternatives follow the eastern corridor (on the east side of the airport). As noted previously, this corridor has a proportionately greater percentage of developed/disturbed acreage and less agricultural land than the western corridor. While the impact to non-native grassland is somewhat less with these alternatives, the impact to grassland/vernal pool complex is substantially (73%) greater than with the western alignments. The A5C1 Alignment has the greatest potential impact to mixed riparian forest (2.06 ha [5.1 ac]) of any alternative. Much of this habitat is associated with Coon Creek. This habitat is structurally diverse and represents the highest quality wildlife habitat available in the Study Area. A number of mammal, bird, reptile and amphibian species would potentially be affected, including some special status species. Indirect impacts may also occur due to displacement of more sensitive species away from the highway corridor. The AAC2 alignment crosses Coon Creek further east, where the riparian corridor is much narrower. Consequently, the direct impact 1.05 ha (2.6 ac) and indirect impact to the riparian corridor are reduced.

D1 and D13

These alternatives follow the western alignment (west of the airport) around Lincoln. As noted previously, these alternatives impact much more agricultural land and less developed/disturbed acreage than the A5C1 and AAC2 alignments. While these alternatives would impact a somewhat greater area of non-native grassland, the impacts to grassland/vernal pool complex would be substantially (43%) less. The impacts to mixed oak woodland would also be less. The D1 alignment impacts only 0.40 ha (1.0 ac) of this community, compared with 10.16 ha (25.1 ac) for the AAC2 alignment and 6.11 ha (15.1 ac) for the A5C1 alignment. Marsh impacts are somewhat greater with these alternatives due to the crossing of extensive marsh habitat along Markham Ravine.

The D1 and D13 alternatives will affect wildlife associated with agricultural lands and grasslands (with and without vernal pools) that comprise about 90 percent of the alignment acreage. Impacts to wildlife species associated with woodland and forest habitats would be reduced with these alternatives compared to the eastern alternatives. Marsh impacts are greater with these alignments, and the marsh habitat affected is of particularly high quality, including a high diversity of open water, emergent wetlands and willow scrub habitats. Consequently, impacts to waterfowl and wading birds will likely be greater with these alternatives. Potential impacts to fish and other aquatic species may also be greater with these alignments, during both construction and long term, due to the larger area of aquatic habitat that would be crossed.

D13 North and South Modified

D13 North Modified has similar impacts to most plant communities compared with D13. D13 South Modified avoids the large oak woodland at the southern end of the Study Area; consequently, the impact to oak woodland with the D13 South Modified is reduced by 95% compared with D13 and D13 North Modified. However, the D 13 South Modified alignment impacts more vernal pools, marsh and total wetlands than the D1, D13 and D13 North Modified alignment.

4.8.4 Special Status Plants & Animals

The proposed project may directly impact special status plants. Indirect impacts may also occur. The species potentially affected include Ahart's dwarf rush, Bogg's Lake hedge hyssop, dwarf downingia and legenere. Ahart's dwarf rush and Bogg's Lake hedge-hyssop have only been found in the eastern portion of the Study Area and may be limited to the eastern corridor. The downingia occurs throughout the Study Area. While the legenere has not been observed, it is likely to occur. For purposes of comparing alternatives, it is assumed that Ahart's dwarf rush and Bogg's Lake hedge hyssop are more likely to be present within the A alignments, while dwarf downingia and legenere are equally likely to be present in all alignments. These are all vernal pool plants; thus, the potential for impacts is directly related to the extent of vernal pool impacts within an alignment. The greatest potential for vernal pool impacts is with the AAC2 and A5C1 alignments. Consequently, the greatest potential impact to special status plant species would also result from alternatives AAC2 and A5C1.

The preferred alternative (D13 North Modified) had less impact to vernal pools, 1.78 ha (4.4 acres) when compared to AAC2 and A5C1, 3.44 ha (8.5 acres) and 4.29 ha (10.6 acres) respectively. Impacts to these special status plants can be mitigated through minimization of vernal pool impacts in the final alignment routing and through preservation and re-creation of appropriate habitat to a less than significant impact per CEQA.

Wildlife

Mammals

The project may potentially affect a number of protected wildlife species. Several special status bat species (greater western mastiff bat, small-footed myotis, long-eared myotis, fringed myotis, long-legged myotis, Yuma myotis, pale big-eared bat and Townsend's western big-eared bat) may potentially occur in the Study Area based on the availability of suitable habitat. These bats may use trees and/or buildings and other structures (e.g., bridges) for roosting and may forage over a variety of habitats in the Study Area. Alternatives that impact large numbers of trees (e.g., AAC2) and buildings

and other structures would have greater potential to impact bats. Pre-construction surveys will be required to accurately assess the potential for impacts to bats. Impacts can be minimized through timing of construction, excluding bats from structures and minimizing impacts to potential roost sites.

The San Joaquin pocket mouse is a federal species of concern. It is not listed as threatened or endangered. This species occurs in grasslands and oak savanna habitats with friable soils. San Joaquin pocket mice were not observed in the study area. Implementation of proposed avoidance and minimization measures to minimize impacts to oak woodlands and other habitats would reduce potential impacts to this species.

Birds

A number of special status bird species are known to occur in the Study Area and may be affected by the project. Forest and woodland areas provide habitat for Cooper's hawk, sharp-shinned hawk and Swainson's hawk. Habitat for northern harrier, burrowing owl, tricolored blackbird, California horned lark, grasshopper sparrow and lark sparrow occurs throughout the Study Area. Habitat for double-crested cormorant, white-faced ibis and American bittern occurs along Markham Ravine and other locations. Nests or nesting behavior has been observed for several of these species. Foraging habitat for prairie falcon, golden eagle, mountain plover and ferruginous hawk also occurs in the Study Area.

The project will directly eliminate foraging and/or nesting habitat used by these species. The AAC2 alignment, which had the highest potential impacts of 10.16 ha (25.1 ac) mixed oak woodland, may impact nesting and/or foraging habitat for Cooper's, sharp-shinned and Swainson's hawks. The western alignments (D1 and D13 and D13 North Modified and D13 South Modified) affect the largest acreage of agricultural land, grassland, riparian forest and marsh; consequently, these alternatives would potentially have greater impacts to special status bird species.

Pre-construction surveys of the selected alignment are required in order to accurately determine the potential for impacts to special status bird species. In addition to avoidance of key habitat and habitat preservation, construction timing will help mitigate potential impacts.

Swainson's Hawk

The Swainson's hawk is a threatened species under the California Endangered Species Act (CESA). The primary reason for the decline of this species, as with other raptors, is thought to be agricultural conversion of native habitats, primarily grassland and riparian forest. This species requires fields or grasslands for foraging and breeds in stands with few trees in juniper-sage flats, riparian areas and oak savanna.

Swainson's hawk nesting habitat in, and in the vicinity of, the project area consists of the taller trees in the Coon Creek, Auburn Ravine and Pleasant Grove Creek riparian corridors. More than 80% of the total project area is suitable foraging habitat for the hawk, which consists for the most part of agricultural lands (active and fallow) and grasslands. At least eight different Swainson's hawks were observed within the project area and a 16.1 km (10 mi) radius. The observations included one pair of hawks constructing a nest and a second pair exchanging prey, indicating the establishment of a territory. At least three of the hawks were observed within the Study Area, including one of the pairs. The combination of extensive foraging habitat adjacent to several suitable riparian nesting sites makes the Study Area highly suitable for this species.

Potential impacts to this species from the proposed project include direct loss of up to 160 ha (400 ac) of foraging habitat, with additional indirect effects due to disturbance along the highway corridor. Given the high value of the nesting and foraging habitat within the project area and the increasing urbanization of the nearby Lincoln area, this is a potentially significant impact under CEQA.

Mitigation for impacts was determined using guidance from DFG guidelines for determining mitigation. Mitigation includes preserving 400 acres of existing grassland habitat in the vicinity of the project through fee title or conservation easement depending on extent of active management. The mitigation described above and additional avoidance and minimization measures for potential impacts to Swainson's hawk foraging habitat will reduce impacts to less than significant under CEQA.

Reptiles

Special status reptiles observed or expected to occur in the natural environment Study Area (Study Area) include the northwestern pond turtle and California horned lizard. Potential impacts to pond turtles will be greatest with the western alignments that remove more aquatic habitat. The horned lizard occurs in a variety of habitat types; consequently, potential impacts to this species are generally related to the overall acreage of habitat impacted.

Amphibians

The special status amphibians potentially occurring in the Study Area are the western spadefoot toad and the California red-legged frog. Spadefoots occupy a variety of lowland habitats, and potential impacts to this species are related to the overall acreage of habitat impacted by the selected alignment.

Red-legged frogs inhabit lowlands and foothills in or near permanent sources of deep water. The frog prefers ponds or creeks with extensive shoreline vegetation but will

disperse 1.6 km (1 mi) or more during or after rain events. Although suitable habitat for the California red-legged frog exists in the project area, due to the presence of non-native predators (i.e.,bullfrog, crayfish, largemouth bass etc.) this species is not expected to occur.

Fish

Federal candidate fall-run Chinook salmon were observed in low numbers in Auburn Ravine, Coon Creek and Ingram Slough. The federally threatened Central Valley steelhead may also occur in similar habitat in the project area. Both of these species are under the jurisdiction of NOAA Fisheries. Pacific lampreys have been observed and the river lamprey could potentially occur; these are both species of special concern.

Bridge construction activities will occur within the live stream at both Coon Creek and Auburn Ravine and Ingram Slough. The existing open channel at these bridge locations will be restricted to culverts during the construction period, forcing fish to move through the culvert pipes. Temporary impacts include the potential loss of 1.52 ha (3.76 ac) of woody riparian and shaded riverine aquatic (SRA) habitat and 0.06 ha (0.15 ac) of open water. There will also be a permanent loss of 0.69 ha (1.70 ac) of woody riparian and SRA habitat for Central Valley steelhead and Central Valley fall-run Chinook salmon.

The following avoidance and minimization measures are proposed to offset any effects to these species or their habitat. Bridges or culverts are proposed for the stream crossings where the species are likely to occur. In stream work will be limited to the period between June 1 and October 31 when fish are least likely to be present in the project area so as not to block migration or otherwise impede fish movements. Revegetation of construction areas following the completion of bridge construction will offset the loss of SRA habitat. In addition, the shading of the streams by the bridge structures and off-site preservation and restoration of SRA habitat will further minimize the loss of SRA. Erosion and siltation best management practices will be implemented to avoid habitat degradation.

A biological assessment was completed under Section 7 of the Federal Endangered Species Act and sent to the NOAA on May 10, 2004. NOAA concurred on May 19, 2004, that the project is not likely to adversely affect the Central Valley steelhead with the proposed avoidance and minimization measures. During the Section 7 consultation, NOAA also determined, per the Magnuson-Stevens Fishery Conservation and Management Act, the project would not adversely affect any Essential Fish Habitat for Pacific Salmon (Fall-run Chinook salmon). The proposed measures will minimize the project effects on these species.

Chinook Salmon

The federally threatened Central Valley steelhead and federal candidate Central Valley fall-run chinook salmon are likely to occur in the project area. Streams likely to support these species include Coon Creek and Auburn Ravine. Ingram Slough does not provide spawning habitat for this species in the project area or upstream of the project area. Although the project area lacks suitable spawning habitat for these species, suitable spawning habitat does occur upstream and fish may pass through the project area during migration.

Juvenile fall-run/late fall-run chinook salmon have been observed in low numbers in the project area in Auburn Ravine, Coon Creek and Ingram Slough. The previous NES reported that these fish were most likely surplus fingerlings planted by CDFG. It is documented that CDFG planted surplus fingerlings in drainages within the project area in an attempt to maximize natural rearing habitat. The reaches of the drainages that flow through the project area do not contain suitable spawning habitat for fall-run/late fall-run salmon but upstream reaches of Auburn Ravine and Coon Creek contain potential spawning habitat. In addition, drainage and tributaries within the project area could provide non-natal rearing habitat for salmon fry in early stages of development.

Central Valley Steelhead

Although not observed in the Study Area during previous surveys, Central Valley steelhead could potentially utilize upstream reaches of Auburn Ravine and/or Coon Creek as spawning habitat. In addition, drainage and tributaries within the project area could provide non-natal rearing habitat for steelhead fry in early stages of development.

Potential project-related impacts to steelhead would be similar to those for chinook salmon.

Invertebrates

The Federally listed vernal pool fairy shrimp (vpfs) and vernal pool tadpole shrimp (vpts) have been recorded in the project area or immediate vicinity and are assumed to be present within all alignments. California linderiella also occur in vernal pools in the study area. These species are generally restricted to vernal pools; thus, alternatives with greater potential impacts to vernal pools (A5C1 and AAC2) will likely have greater impact to these invertebrates. Because all alignments impact vernal pools, it is not possible to avoid impacting these species. Mitigation in accordance with FWS guidelines is required.

Due to the length of the corridor and distribution of pools in the project area, it is not possible to completely avoid vernal pool impacts. Eight vernal pool complexes were

previously identified within the study area based on geographic and hydrologic connectivity. All of the alignments evaluated cross six of these eight complexes. The complexes range from small, disturbed units completely surrounded by existing development to large, diverse units including tracts of undisturbed, high quality and high-density pools. The project will directly impact vernal pools that provide potential habitat for VPFS and VPTS, and the presence of both species is inferred in these habitats.

Indirect impacts to listed invertebrates may also occur outside of the project alignment due to altered pool hydrology. Contributing watershed, while not necessarily critical to the volume of water available to a pool, may play an important role in water level dynamics. Substantial loss of watershed may result in fluctuating water levels during the winter that could affect both plant and invertebrate populations within the pool (Hanes and Stromberg 1996). Effects are further limited to pools and swales that are down slope from the roadway alignment.

The D13 North Modified alternative will have a direct impact to 10.90 ha (26.94 ac) of vernal pools/swales and an indirect impact of 5.49 ha (13.56 ac) to vernal pools/swales. These revised impacts were submitted to FWS in a supplement to the Biological Assessment (BA). The BA concluded that the project would have an adverse effect on the VPFS and VPTS. The FWS concurred and responded with their Biological Opinion, which states that with the implementation of the proposed mitigation measures that are described in Section 4.8.8 of this document, the project will not likely jeopardize the continued existence of the VPFS and VPTS. The project will still cause direct take of the species, which has been authorized by the FWS as a result of the completed Endangered Species Act consultation. With the implementation of the mitigation measures listed in the Biological Opinion, the project will have a less than significant impact on these listed vernal pool species.

Critical Habitat for Vernal Pool Fairy Shrimp (VPFS) and Vernal Pool Tadpole Shrimp (VPTS)

Critical habitat was designated for the VPFS and VPTS on August 6, 2003. VPFS critical habitat extends as far north as Jackson County, Oregon, and as far south as Ventura County, California. There are 32 units of critical habitat mapped for this species. Most of the vernal pools in the study area are within designated critical habitat for VPFS (Unit 12) and most of the project impacts to vernal pools and swales within the preferred alignment (D13 North Modified) affect critical habitat for this species.

Designated critical habitat for VPTS extends from Shasta County, California at the northern extent to Kings County and Tulare County, California at the southern end. No critical habitat for this species is designated within the project area, nor within Placer

County. The critical habitat areas for this species closest to the project area are south of the city of Sacramento in Sacramento County, and a small polygon designated in Yuba County, east of Marysville. Construction of the project will not impact critical habitat for VPTS.

Valley Elderberry Longhorn Beetle (VELB)

There are a number of recent records for VELB (i.e., positive identification of exit holes) in the project vicinity, including records from Roseville and Rocklin, about 16 km (10 miles) south of the project area, and from the Bear River, immediately north of the project area.

VELB may occur in the project area, although the beetle's host plant, elderberry, is not common in the project area and no signs of beetles (exit holes) have been recorded in the project study area.

Two areas along the American River in the Sacramento metropolitan area were designated as critical habitat for VELB. In addition, an area along Putah Creek in Solano County, and the area east of Nimbus Dam on the American River in Sacramento County, is identified as important habitat for the recovery of the species. The study area is not located within critical habitat for VELB.

Potential project related impacts to VELB are limited to direct impacts to elderberry plants during project construction. Indirect impacts are not expected to occur as no other plants were observed along the project alignment.

The project will affect two elderberry plants occurring in a clump with 10 stems of sufficient size (>1 inch diameter at ground level) to provide habitat for VELB. The elderberry plants are both located along an old breakout channel of Auburn Ravine. No exit holes were observed on either plant. Although this area is away from the active stream channel, and in an area classified as woodland habitat, per FWS guidelines, these plants are classified as riparian.

A BA was submitted to the FWS for impacts to the VELB in April 2004. The BA concluded that the project would potentially have a direct impact on the VELB. The FWS concurred in a BO and further stated that with the implementation of the mitigation measures spelled out in the BA, and discussed in Section 4.8.8, the project would not likely jeopardize the continued existence of the VELB. The BO also contained authorization for incidental take of the insect. With the implementation of the mitigation measures described in Section 4.8.8, the project will have a less than significant effect on the VELB under CEQA.

4.8.5 Impacts to Key Resources

Table 4-19 provides a side-by-side comparison of the impacts to key resources associated with each of the six alternatives. Figure 4-4 on page 4-68 provides a graphical presentation of this same information. As the table and figure show, none of the alternatives is obviously superior in terms of the impacts to key resources. These resources are broadly distributed throughout the project corridor and none of the alignments minimizes impacts to all resources.

In addition to project impacts on biological resources, another factor that must be considered in evaluating alternatives is the effectiveness of available avoidance and minimization measures in offsetting project-related losses. It is not possible to fully offset impacts to mixed oak woodland and mixed riparian forest, regardless of the avoidance and minimization measures employed since many of the trees are over 100 years old, and development of mature riparian forest requires decades. Young trees can be planted and, over time, viable habitat will develop. However, the temporal loss of habitat value while the trees grow and the habitat structure develops cannot be directly offset. Vernal pool impacts may also be difficult to offset due, in part, to the high probability of special status species being present. In comparison, freshwater marsh impacts are relatively easy to offset. Consequently, impacts to oak woodlands, riparian forest and vernal pool habitats should be viewed as more important than impacts to freshwater marsh.

Table 4-19 Comparison of Direct Impacts to Key Resources

Alignment	Natural Communities	Wetlands / Waters	Summary
A5C1	93.68 ha (231.5 acres) grasslands containing vernal pools 2.06 ha (5.1 acres) riparian forest 6.11 ha (15.1 acres) oak woodland	7.85 ha (19.4 acres) wetlands/waters 4.656.5 ha (11.5 acres) vernal pools/swales 2.59 ha (6.4 acres) of marsh Two high value vernal pool complexes	Greatest total wetland, vernal pool, grassland w/ vernal pools and riparian forest impacts of any alternative
AAC2	88.18 ha (217.9 acres) grasslands containing vernal pools 1.05 ha (2.6 acres) riparian forest 10.16 ha (25.1 acres) oak woodland	6.23 ha (15.4 acres) wetlands/waters 3.80 ha (9.4 acres) vernal pools/swales 1.83 ha (4.5 acres) of marsh Two high value vernal pool complexes	Less impact to riparian forest, total wetlands and vernal pools than A5C1; large impact to oak woodlands
D1	76.01 (187.8 acres) grasslands containing vernal pools 1.13 ha (2.8) riparian forest 0.4 ha (1.0 acre) oak woodland	5.30 ha (13.1 acres) wetlands/waters 2.43 ha (6.0 acres) vernal pools/swales 2.38 ha (5.9 acres) of marsh One high value marsh	Less impact to vernal pool grasslands, vernal pools and total wetlands than AAC2 and A5C1. Small impact to oak woodlands.

Alignment	Natural Communities	Wetlands / Waters	Summary
D13	70.05 ha (173.1 ac) grasslands containing vernal pools 1.21 ha (3.0 ac) riparian forest 3.28 ha (8.1 ac) oak woodland	4.73 ha (11.7 ac) wetlands/waters 2.14 ha (5.3 ac) vernal pools/swales 2.22 ha (5.5 ac) of marsh One high value marsh	Comparable to D1 except for greater impact to oak woodlands, less impact to vernal pools.
D13 Mod. South	76.65 ha (189.4 ac) grasslands containing vernal pools 1.05 ha (2.6 ac) riparian forest 0.08 ha (0.2 ac) oak woodland	5.91 ha (14.6 ac) wetlands/waters 3.28 ha (8.1 ac) vernal pools/swales 2.22 ha (5.5 ac) of marsh One high value marsh	Greatest impact to wetlands and vernal pools of any D alternative. Smallest impact to oak woodlands of any alternative.
D13 Mod. North - Preferred Alternative	80.98 ha (200.1 ac) grasslands containing vernal pools 1.21 ha (3.0 ac) riparian forest 3.28 ha (8.1 ac) oak woodland	5.5 ha (13.6 ac) wetlands/waters 2.23 ha (5.5 ac) vernal pools/swales 2.95 ha (7.3 ac) of marsh One high value marsh	Impacts comparable to D13 except for greater impact to grassland/vernal pool complex.

Table 4-20 Preferred Alternative Revised Impacts

D13 North Modified	Wetlands/ Non-wetland Waters	Natural Communities Wildlife, Fisheries	Water Quality	Agricultural Land
Direct Impacts	0.11 ha (0.26 ac) non - wetlands/waters 10.9 ha (26.9 ac) vernal pools/swales 6.54 ha (16.15 ac) of vernal and freshwater marsh	0.01 ha (0.02 ac) willow scrub 17.13 ha (42.33 ac) non-native grassland 113.49 ha (280.43 ac) grassland northern hardpan vernal pool complex 1.65 ha (4.07 ac) grassland/northern volcanic mudflow vernal pool complex 0.69 ha (1.70 ac) mixed riparian forest 5.35 ha (13.22 ac) mixed oak woodland 9.55 ha (23.59 ac) vernal pool fairy shrimp critical habitat	333.1 ha (823 ac) footprint with 9 stream crossings	157.19 ha (388.40 ac)
Indirect Impacts [1]	8.5 ha (21.0 ac) vernal pools/swales	6.93 ha (17.12 ac) vernal pool fairy shrimp critical habitat	377.2 ha (932 ac) footprint	

[1] Indirect impacts were determined based upon USFWS guidelines and in cooperation during Section 7 consultation

4.8.6 Jurisdictional Waters

The wetlands delineation was completed in 1994, and verified by the USACE. (See Chapter 7, Comments and Coordination) After discussion with the USACE, it was agreed that for the purposes of comparison of the alternatives, the 1994 delineation would be used (Personal communication, Cavanaugh, March 10,1998). An additional wetland verification was completed and submitted to USACE for approval and verification in March 2004. The proposed project will impact wetlands and other waters subject to regulation by the USACE and/or CDFG.

Impacts to wetlands and other jurisdictional waters within each alternative alignment are presented in Table 4-21. The table shows acreage of each wetland type

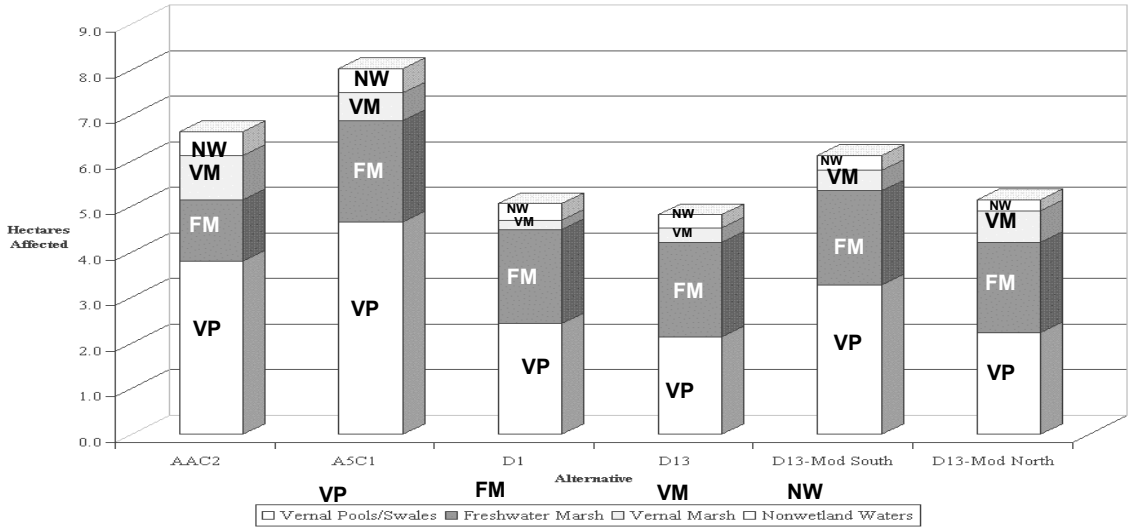
within each alternative alignment. The total acreage of jurisdictional waters within the project area is also provided for comparison.

Figure 4-5 provides a graphical presentation of the impacts to USACE jurisdictional waters with each project alternative. Figure 3-18 in Chapter 3, shows an aerial with the wetlands marked along with an overlay of the proposed project.

Table 4-21 Impacts to Jurisdictional Waters Occurring in the Study Area

USACE Wetlands	Total Within Study Area	A5C1	AAC2	D1	D13	D13 - Mod. South	D13 - Mod. North (Preferred Alternative)
Willow Scrub	1.90 ha	0.08 ha	0.08 ha	0.12 ha	0.08 ha	0.08 ha	0.08 ha
	4.70 ac	*0.20 ac*	*0.20 ac*	*0.30 ac*	*0.20 ac*	*020 ac*	*0.20 ac*
Freshwater Marsh	61.47 ha	2.23 ha	1.34 ha	2.06 ha	2.06 ha	2.06 ha	1.98 ha
	151.90 ac	*5.50 ac*	*3.30 ac*	*5.10 ac*	*5.10 ac*	*5.10 ac*	*4.90 ac*
Vernal Marsh	10.32 ha	0.36 ha	0.49 ha	0.32 ha	0.16 ha	0.16 ha	0.97 ha
	25.50 ac	*0.90 ac*	*1.20 ac*	*0.80 ac*	*0.40 ac*	*0.40 ac*	*2.40 ac*
Vernal Pool	31.24 ha	4.29 ha	3.44 ha	2.06 ha	1.74 ha	2.87 ha	1.78 ha
	77.20 ac	*10.60 ac*	*8.50 ac*	*5.10 ac*	*4.30 ac*	*7.10 ac*	*4.40 ac*
Vernal Swale	2.87 ha	0.36 ha	0.36 ha	0.36 ha	0.40 ha	0.40 ha	0.45 ha
	7.10 ac	*0.90 ac*	*0.90 ac*	*0.90 ac*	*1.00 ac*	*1.00 ac*	*1.10 ac*
Total USACE Wetlands	107.81 ha	7.33 ha	5.71 ha	4.94 ha	4.45 ha	5.58 ha	5.26 ha
	266.40 ac	*18.10 ac*	*14.10 ac*	*12.20 ac*	*11.00 ac*	*13.80 ac*	*13.00 ac*
USACE Waters of U.S.	11.33 ha	0.53 ha	0.53 ha	0.36 ha	0.28 ha	0.32 ha	0.24 ha
	28.00 ac	*1.30 ac*	*1.30 ac*	*0.90 ac*	*0.70 ac*	*0.80 ac*	*0.60 ac*
Total USACE Jurisdictional Waters	119.14 ha	7.85 ha	6.23 ha	5.3 ha	4.73 ha	5.91 ha	5.50 ha
	294.40 ac	*19.40 ac*	*15.40 ac*	*13.10 ac*	*11.70 ac*	*14.60 ac*	*13.6 ac*
CDFG Jurisdictional Waters	92.55 ha	4.90 ha	2.99 ha	3.68 ha	3.64 ha	3.52 ha	3.52 ha
	228.7 ac	*12.10 ac*	*7.40 ac*	*9.10 ac*	*9.00 ac*	*8.70 ac*	*8.70 ac*

Figure 4-5 Potential Impacts to USACE Jurisdictional Waters



CDFG jurisdiction excludes vernal pools and other wetland features that are not part of a stream or lake; however, riparian habitat, freshwater marsh, willow scrub and open water habitats are included in CDFG jurisdiction.

As shown in the preceding table and figure, all alignments impact jurisdictional waters, including wetlands. The eastern corridor alternatives impact a proportionately greater area of vernal pools and swales, including the high value vernal pool complex west of the clay pits identified in the Wetland Value Assessment (Chapter 3, Wetlands/Jurisdictional Waters Assessment). The western corridor alternatives impact slightly more marsh habitat, including the high value marsh complex along the east end of Markham Ravine identified in the Wetland Value Assessment. Overall, the impacts to jurisdictional waters are greater with the eastern corridor alternatives, and particularly the A5C1 alignment, which affects more jurisdictional waters than the next highest impacting alternative, AAC2.

4.8.7 Updated Impacts to Plant Communities for D13 North Modified (Preferred Alternative)

Impacts were calculated based upon preliminary design information to provide a basis for comparison of the alternatives. After receiving the LEDPA concurrence from EPA and USACE, impacts were calculated for the preferred alternative considering refined design and using the 250 foot buffer around vernal pools recommended by the FWS. The revised impacts are listed in Table 4-22. All of the other alternatives, if chosen as the LEDPA; would have similar increased impacts to resources with these revisions. Therefore, the conclusion that D13 North Modified is the LEDPA has not changed.

The increase in impacts is due to revised design information that was applied to the LEDPA and the application of FWS guidelines and recommendations regarding direct and indirect impacts. Initially the impacts of vernal pools were calculated as follows; if a vernal pool was partially within the project footprint and partially outside of the footprint, the portion that was within the direct project impact area was calculated as being directly impacted and the area outside of the project footprint was calculated as indirectly impacted. In addition, anything that was within a 250-foot corridor on either side of the project limits was calculated as being indirectly impacted (according to FWS guideline interpretation). However, after this original impact calculation was submitted to FWS, FWS during the Section 7 consultation requested that the calculations be revised to meet their interpretation of the guidelines. Therefore, any vernal pool that is partially impacted by the project is now considered directly impacted and vernal pools that are considered

hydrologically connected per FWS are now considered indirectly impacted even if they are beyond the original 250-foot indirect corridor area.

Table 4-22 Revised Impacts to Plant Communities Occurring in the Study Area

Community	Total Within Study Area	Original D13-Modified North	Revised D13 - Modified North (Preferred Alternative)
Developed/ Disturbed	176.93 ha	18.78 ha	30.82 ha
	437.2 ac	*46.40 ac*	*76.15 ac*
	8.5 %	8.75%	9.26%
Agricultural Lands	873.99 ha	94.74 ha	157.19 ha
	2159.6 ac	*234.10 ac*	*388.40 ac*
	42.2 %	44.13%	47.21%
Non-native Grassland	211.42 ha	12.42 ha	17.13 ha
	522.4 ac	*30.70 ac*	*42.33 ac*
	10.2 %	5.79%	5.15%
Mixed Oak Woodland	49.37 ha	3.28 ha	5.35 ha
	122.0 ac	*8.10 ac*	*13.22 ac*
	2.4 %	1.53%	1.61%
Mixed Riparian Forest	17.85 ha	1.21 ha	.69 ha
	44.1 ac	*3.00 ac*	*1.70 ac*
	0.9 %	0.57 %	0.21 %
Valley Freshwater Marsh	61.47 ha	1.98 ha	.99 ha
	151.9 ac	*4.90 ac*	*2.44 ac*
	3.0 %	.92%	.30 %
Great Valley Willow Scrub	1.9 ha	0.08 ha	0.01 ha
	4.7 ac	*0.20 ac*	*0.02 ac*
	0.1 %	0.04%	0.0%
Grassland / Northern Hardpan Vernal Pool Complex	646.43 ha	78.11 ha	113.49 ha
	1597.3 ac	*193.00 ac*	*280.43 ac*
	31.2 %	36.38 %	34.09 %
Grassland/Northern Volcanic .Mudflow Vernal Pool Complex	11.9 ha	2.87 ha	1.65 ha
	29.4 ac	*7.10 ac*	*4.07 ac*
	0.6 %	1.34%	.49%
Vernal Marsh	10.32 ha	0.97 ha	5.55 ha
	25.5 ac	*2.40 ac*	*13.71 ac*
	0.5 %	0.45 %	1.67 %
Open Water	11.33 ha	0.24 ha	0.11 ha
	28.0 ac	*0.60 ac*	*0.26 ac*
	0.5 %	0.11%	0.03%
Total	**2072.91 ha**	**214.69 ha**	**332.96 ha**
	5122.1 ac	***530.5 ac***	***822.73 ac***
	100.0 %	**100.0%**	**100.0%**

The greatest changes in impacts for the D13 North Modified (Preferred Alternative) are in the Agricultural Lands and Grassland/Northern Hardpan Vernal Pool Complex

categories. The original impacts to Agricultural Lands was calculated at 94.74 ha (234.10 ac) compared to the revised impacts of 157.19 ha (388.40 ac), an increase of 62.45 ha (154.30 ac). The original Grassland/Northern Hardpan Vernal Pool Complex impacts were calculated as 78.11 ha (193.00 ac) compared to 113.49 (280.43 ac), a difference of 35.38 ha (87.43 ac). These figures represent corrections in design and changes in impacts due to application of regulatory methodology.

4.8.8 Proposed Avoidance, Minimization and Mitigation Measures for Natural Resources

Introduction

The project was designed to avoid the natural resources as much as possible and has also employed many design features that serve to avoid and minimize as much as possible the natural resources in the study area. In spite of these efforts, impacts to natural resources and protected species still occur. Therefore, mitigation for the impact to these resources is required. The overall goal of the mitigation program is to offset project impacts to: 1) jurisdictional wetlands and other waters in terms of area and functions and values; 2) oak riparian forest and woodlands and individual oak and other trees; and 3) State and/or federally listed special status species: Swainson's hawk, vernal pool fairy shrimp and tadpole shrimp and valley elderberry longhorn beetle, Central Valley steelhead and Central Valley fall-run chinook salmon.

This goal will be achieved through the following three elements: 1) permanent preservation of existing high quality vernal pools and other wetlands, riparian habitats, oak woodlands, and grasslands; 2) restoration of habitats temporarily impacted during project construction; and 3) compensation through creation of new wetlands, riparian habitats, oak woodlands, and other habitats with functions and values comparable to or better than the impacted areas. The use of all of these strategies will increase the likelihood that project impacts to biological resources and wetlands are appropriately offset.

On-site restoration of temporary impacts following completion of construction is also a preferred strategy that assures replacement of functions and values where they have been temporarily interrupted. Restoration of degraded habitats will be employed wherever possible and offers greater assurance of success compared with creation of habitats in areas where they never occurred.

Finally, this approach relies on advance mitigation of impacts wherever possible to reduce temporal loss of habitat functions and provide greater assurance of success. If mitigation can be implemented in advance and shown to be successful, it also reduces or

eliminates the need to increase mitigation ratios in order to compensate for temporal habitat losses and the risk of mitigation failure.

Mitigation of various types and at various ratios is proposed depending on the resource affected. The proposed mitigation ratios are based on the goals described above, and consider temporal habitat loss and the risk of mitigation failure. Agency mitigation guidelines are also addressed. A summary of the proposed mitigation elements is presented in Table 4-23. Additional mitigation for impacts to these species is described in the Mitigation and Monitoring Plan (MMP) and includes preservation of habitat and additional revegetation and monitoring requirements. A draft MMP was reviewed by USACE, EPA and FWS and preliminary concurrence was obtained from USACE and EPA in December 2004. A final mitigation plan will be prepared in conjunction with the regulatory agencies and will be submitted for final approval before the project is constructed.

Table 4-23 Proposed Compensatory Mitigation Requirements for Preferred Alternative D13 North Modified

Habitat Type	Impact	Proposed Mitigation Strategy	Proposed Preservation	Proposed Creation	Proposed Restoration
Jurisdictional Waters					
Vernal pools and swales (for Section 404 purposes) Note: This mitigation element is fully met through vernal pool invertebrate mitigation described below	Direct: 4.23 ha (10.45 ac)	Preservation of vernal pool wetlands at a 3:1 ratio and creation at a 1:1 ratio Preservation of vernal pool wetlands at a 1:1 ratio	12.85 ha (31.76 ac)	4.19[1] ha (10.35 ac)	_____
	Indirect: 12.16 ha (30.05 ac)		12.16 ha (30.05 ac)		
	Total: 16.39 ha (40.50 ac)		Total: 25.16 ha (61.81 ac)		
Vernal marsh, freshwater marsh, and non wetland open water habitats	Permanent: 6.64 ha (16.41 ac)	Creation of new marsh habitat at a 1:1 ratio Creation or restoration of marsh habitat at 1:1 ratio	_____	6.64 ha (16.41 ac)	_____
	Temporary: 0.18 ha (0.45 ac)			0.18 ha (0.45 ac)	
Willow scrub habitats	0.008 ha (0.02 ac)	Creation of new willow scrub habitat at a 1.5:1 ratio	_____	0.012 ha (0.03 ac)	_____

Habitat Type	Impact	Proposed Mitigation Strategy	Proposed Preservation	Proposed Creation	Proposed Restoration
Mixed riparian forest habitats	Permanent: 0.69 ha (1.70 ac) Temporary: 1.52 ha (3.76 ac)	Preservation of existing habitat at a 2:1 ratio for offsetting permanent impacts Habitat restoration/creation providing sufficient area for tree planting at a maximum density of 400 trees/ac on-site and 242 trees/ac off-site; for 6,550 planted trees, this equates to 9.96 ha (24.61 ac), a 4.5:1 habitat replacement ratio	1.38 ha (3.40 ac)	Restoration/creation with a total area of 9.96 ha (24.61 ac), including 1.52 ha (3.76 ac) on-site and 8.44 ha (20.85 ac) off-site Total area of 9.96 ha (24.61 ac)	
Mixed riparian forest trees	431 trees with 16,637 cm (6,550 in) total dbh	Tree planting @ 1 sapling per 1" dbh impact	_____	Planting of 6,550 tree saplings on 9.96 ha (24.61 ac)	
Swainson's hawk	236 ha (584 ac) foraging habitat w/in 16 km (10 mi) of active nest	Preservation of existing grassland habitat through fee title or conservation easement according to CDFG ratios	153.8-177.7 ha (380-439 ac) preserve depending on extent of active mgmt allowed	NA	NA
Central Valley steelhead and fall-run Chinook salmon	Temporary: 1.52 ha (3.76 ac) SRA habitat; 0.06 ha (0.15 ac) open water Permanent: 0.69 ha (1.70 ac) SRA habitat	Included under open water and mixed riparian forest mitigation above			
VELB	2 plants with 10 stems >1" diameter	Transplant elderberries / additional plantings per 1999 FWS guidelines	0.10 ha (0.24 ac) conservation area	_____	Planting of 29 elderberries and 29 associates
Vernal pool fairy shrimp/ tadpole shrimp (based on FWS guidelines for direct/indirect impacts)	Direct: 10.90 ha 26.94 ac Indirect: 5.49 ha (13.56 ac)	Combined preservation/ creation of vernal pool wetlands at a 3:1 ratio Preservation of vernal pool wetlands at a 2:1 ratio	19.53 ha (48.257 ac) 5.49 ha (13.56 ac) Total: 25.01 ha (61.81 ac)[2]	4.19 ha (10.35 ac)	_____

[1] Based on maximum creation potential at Aitken Ranch.

[2] Includes 4.48 ha (11.06 ac) preservation already implemented at Aitken Ranch.

Compensatory Mitigation Sites

The Biological Opinions "Terms and Conditions" require Caltrans to protect a total of 72 wetted acres of vernal pool crustacean habitat in perpetuity including 62 acres of existing and 10 acres of created habitat. The BO specifies four locations for acquisition and protection of the required habitat including the Aitken Ranch, the Rockwell-Mariner property and the Bryte Ranch Conservation Bank and Beach Lake. Mitigation at Aitken Ranch, Bryte Ranch and Beach Lakehas already been implemented. A conservation easement will be used to secure the Rockwell Mariner site.

The **Aitken Ranch** property is located just to the west of the City of Lincoln in western Placer County. The 128 ha (317 ac) property includes about 1,700 m (5,575 feet) of the Auburn Ravine riparian corridor as well as grassland/vernal pool complex and seasonal and perennial marsh. Aitken Ranch supports upland annual grasslands containing vernal pools and swales, mixed riparian forest dominated by valley oak, marsh/open water habitats, and ruderal disturbed areas.

The grasslands, riparian forest and marsh communities at Aitken Ranch provide moderate to high value for wildlife. Based on surveys performed by Wildlands, a variety of common terrestrial wildlife species is present on the property.

An USACE verified delineation has been performed for the Aitken Ranch property. The USACE confirmed the presence of 11.40 ha (28.18) ac of wetlands and other waters of the United States on the 128 ha (317 ac) parcel. This total includes 2.66 ha (6.57 ac) of vernal pools, 1.82 ha (4.49 ac) of seasonal swales, 0.57 ha (1.40 ac) of seasonal wetlands, 2.68 ha (6.63 ac) of emergent marsh, 1.72 ha (4.25 ac) of open water (pond), 1.11 ha (2.75 ac) of perennial stream and 0.03 ha (0.09 ac) of intermittent stream.

The Aitken Ranch Habitat Development Plan (HDP) meets the mitigation needs of the SR 65 project for vernal pool wetlands, oak woodlands and riparian forest.

The 232 ha (573 ac) **Bryte Ranch Conservation Bank** is located in eastern Sacramento County, extending north from the intersection of Calvine and Grant Line Roads. The property is owned by Bryte Ranch LLC. A conservation easement in favor of the California Department of Fish and Game (CDFG) has been recorded on the property and CDFG is funded through an endowment to provide management oversight. If title is transferred in the future, the property transfer documents will state that the new owner will be responsible for carrying out the mitigation plan for the property.

The site is characterized by flat to gently rolling terrain comprised of annual grassland dominated by non-native species including sticky tarweed (*Holocarpha virgata*), wild oat (*Avena fatua*), and soft brome (*Bromus hordeaceus*).

The northern portion of the site supports high-density vernal pools. The southern portion of the site supports scattered vernal pools and a seasonal wetland drainage. The central portion of the site is dominated by one large wetland feature, which exhibits both vernal pool and marsh-like characteristics. Vegetation in the pools is largely consistent with other pools in the geographic area. The lower terrace of the property has many of the same, but is generally less diverse due to past agricultural practices.

A wetland delineation was conducted for the site during August and September 1998 in accordance with the 1987 USACE Manual (Environmental Laboratory 1987). A total of 67.56 ha (166.94 ac) of jurisdictional waters were verified by the USACE in

1999. The property includes 742 vernal pools with an area of 55.9 ha (138.2 ac) and 1.5 ha (3.6 ac) of interconnecting swales.

The 57.5 ha (142-acre) **Beach Lake Mitigation Bank** (BLMB) is located immediately south of Morrison Creek between the Sacramento River and I-5, west of the City of Elk Grove, in Sacramento County. The BLMB is located within the Stone Lakes National Wildlife Refuge. In 1994, Caltrans entered into a formal mitigation banking agreement with Federal Highways Administration, EPA, FWS, USACE and CDFG. Caltrans currently owns the property in fee. Once the mitigation credits are exhausted, Caltrans plans to transfer ownership of the property to FWS as part of the Stone Lakes refuge.

The BLMB consists of a complex of wetland habitats with intervening uplands. Before wetland enhancement, most of the property was in agricultural use. Natural communities on the site included cottonwood forest, Valley oak riparian forest, willow scrub, freshwater marsh, and seasonal marsh. These habitats were primarily associated with Beach Lake and Morrison Creek. In 1992, Caltrans delineated 14.8 ha (36.6 ac) of wetlands on the property.

The BLMB was designed primarily for mitigation of freshwater valley wetlands (excluding vernal pools). Wetlands include three constructed ponds supporting seasonal and permanent marsh and woody riparian habitats comprised of forested, shrub/scrub, and woodland types.

The **Rockwell/Mariner property** is one of the last un-fragmented vernal pool/grassland complexes remaining in western Placer County. The 792-acre parcel, which contains vernal pools and upland, provides connectivity between neighboring Auburn Ravine grassland vernal pool area to the south and the Coon Creek floodplain and riparian area to the north. Without this link, maintenance of an un-fragmented, inter-connected reserve system will be difficult to achieve. The result of which effects migratory pathways (i.e. continuity), genetic integrity, and overall biodiversity.

Given the quality of the vernal pool complexes known to exist on the Rockwell/Mariner property, it is likely that many Federal and State protected species, both plant species and the fairy shrimp and the tadpole shrimp would be found there. In addition, the upland areas would support Federal and State protected species such as the Swainson's hawk and other grassland birds and mammals.

The Rockwell-Mariner property was identified in 2004 as a second vital site needing protection due to the property's particular location and apparent high concentration of undisturbed vernal pool crustaceans habitat. As a proposed conservation measure, Caltrans would acquire the property to preserve its significant existing habitat

values. As a result, the site would also be protected from any future development that might follow the building of the bypass.

Mitigation of wetlands, waters of U.S. and riparian habitat

Caltrans has investigated a number of options for mitigating impacts to wetlands and riparian habitats. The options considered fall into four categories: 1) use banked credits at Caltrans Beach Lake Mitigation Bank in Sacramento County; 2) purchase mitigation credits from an existing or proposed, private mitigation bank that serves the project area; 3) purchase land or conservation easements over land with high quality resources and preserve it in perpetuity; and 4) use surplus lands purchased for construction of the Lincoln Bypass as mitigation areas.

After consideration of these mitigation options, Caltrans determined that the most effective mitigation approach was a combination of the following elements:

1. Perform on-site restoration of marsh and riparian habitats temporarily impacted during project construction and create on-site vernal marsh habitat at the Yankee Slough crossing;
2. The Aitken Ranch conservation area fulfills much of the proposed compensatory mitigation for the SR 65 project. Aitken Ranch has quality vernal pools and swales, mixed riparian forest, and grassland for preservation, and areas appropriate for proposed compensatory habitat creation activities.
3. Purchase fee title or a conservation easement over a private property (properties) located within the vicinity of SR 65 project area.
4. Use available credits at the Beach Lake mitigation bank for offsetting impacts to freshwater marsh and riparian habitats. Beach Lake is a FWS approved Caltrans mitigation bank located in Sacramento County that has well established riparian and marsh habitats available for use on the SR 65 project.
5. Purchase vernal pool preservation credits from an approved conservation bank to make up any shortage in required preservation credits.

Caltrans is also working with Placer Legacy and the Environmental Protection Agency to conserve the Coon Creek riparian corridor through purchase of conservation easements within the Coon Creek watershed. This project feature will help preserve open space along the Coon Creek corridor in perpetuity.

Mitigation Measures for Vernal and Freshwater Marsh, Open Water and Willow Scrub

Vernal and freshwater marsh, open water, and willow scrub are discussed together because they typically occur in geographic proximity (e.g., as part of a single wetland system). The project will result in permanent, direct impacts to 5.55 ha (13.71 ac) of

vernal marsh habitats, 0.99 ha (2.44 ac) of freshwater marsh habitats, 0.008 ha (0.02 ac) of willow scrub habitat, and 0.11 ha (0.26 ac) of open water habitat. An additional 0.12 ha (0.30 ac) of freshwater marsh and 0.06 ha (0.15 ac) of open water will be temporarily impacted during project construction. The basic approach for mitigation of these wetland and open water habitats is to create replacement habitat that provides functions and values comparable with the habitats to be impacted. Restoration of 0.12 ha (0.30 ac) of freshwater marsh habitat temporarily impacted during construction will occur on site at Ingram Slough; restoration of 0.06 ha (0.15 ac) of temporary impact to open water will occur on site at Auburn Ravine. Mitigation (0.81 ha/2.00 ac) for a portion of the permanent impact to vernal marsh will also be provided on site at Yankee Slough. The remainder of the vernal marsh mitigation (4.74 ha /11.71 ac), freshwater marsh mitigation (0.99 ha/2.44 ac), willow scrub mitigation (0.01 ha/0.03 ac), and open water mitigation (0.11 ha/0.26 ac) will occur off site at Aitken Ranch and Beach Lake Mitigation Bank.

Mitigation for vernal and freshwater marsh and open water habitats is proposed at a 1:1 ratio; mitigation for willow scrub habitat is proposed at a 1.5:1 ratio. Normally, these ratios are increased in order to offset the risk of mitigation failure and the temporal loss of habitat functions as the replacement habitat develops. However, for this project, mitigation for these habitats is already in place and will be well established by the time project impacts occur. Created wetland habitats at Beach Lake have been in place for over ten years and are well developed. Habitats at Aitken Ranch will also have been in place for several years before construction of the SR 65 project begins.

Mitigation Measures for the Valley Vernal Pool Fairy Shrimp and Tadpole Shrimp

Mitigation for vernal pool fairy shrimp and tadpole shrimp will be accomplished through preservation and creation of vernal pool and swale habitats as described above. Table 4-24 shows the direct and indirect impacts to vernal pools. Table 4-25 shows the proposed conservation areas, both preservation and creation along with the acreage proposed at each site.

Table 4-24 Vernal Pool Impacts and Mitigation

	Acreage Affected	Acres of Preservation	Acres of Creation
Direct Total	26.94 ac	70.47 ac	10.35 ac
Indirect Total	13.56 ac	27.12 ac	--
Total	40.50 ac	97.59 ac	10.35 ac

Table 4-25 Proposed Conservation Areas to Create and Preserve Vernal Pool Habitat in Perpetuity

	Aitken Ranch	Rockwell/Mariner	Bryte Ranch	Total Acreage
Preservation	11.06 ac	43.22 ac	7.53 ac	61.81 ac
Creation	10.35 ac	-	-	10.53 ac
Total	21.41 ac	43.22 ac	7.53 ac	72.16 ac

Mitigation Measures for Swainson's Hawk

Mitigation for impacts to the State listed Swainson's hawk will be accomplished in accordance with CDFG guidelines. The guidelines require the acquisition of Habitat Management lands at various ratios based on the distance of the proposed project from an active nest tree. Habitat Management lands may be acquired in fee title, or through a conservation easement, based on the following criteria:

For projects within one mile of an active nest tree:

- Option A: One acre of Habitat Management lands for each acre of development where at least 10 percent of the Habitat Management lands are provided through fee title or conservation easement that allows active management of the habitat; the remaining 90 percent can be provided through conservation easement, acceptable to CDFG, on agricultural lands that provide foraging habitat for Swainson's hawks; or
- Option B: One-half acre of Habitat Management lands for each acre of development where all of the lands are provided through fee title or a conservation easement that allows for active management of the habitat.

For projects within five miles, but farther than one mile, from an active nest tree:

- Three-fourths acre of Habitat Management lands for each acre of development where all of the lands are provided through fee title or conservation easement, acceptable to CDFG, on agricultural lands that provide foraging habitat for Swainson's hawks.

For projects within ten miles, but farther than five miles, of an active nest tree:

- One-half acre of Habitat Management lands for each acre of development where all of the lands are provided through fee title or conservation easement, acceptable to CDFG, on agricultural lands that provide foraging habitat for Swainson's hawks.

Due to the linear nature of the SR 65 project, the distance to an active nest tree varies along the alignment. The total area of impacted foraging habitats within each

distance range to active nests was calculated, and the mitigation requirements are summarized below.

Table 4-26 Swainson's hawk Mitigation Measures (CEQA)

Distance to Nest Tree	Area	Mitigation Requirement
Less than one mile	47.7 ha (118 acres)	a) 47.7 ha (118 acres) of suitable lands, 10% must be available for active management; or b) 23.9 ha (59 acres) of suitable lands, all of which must be available for active management
Greater than one mile/less than five miles	141.2 ha (349 acres)	105.9 ha (261.7 acres) of suitable lands
Greater than five miles/less than ten miles	47.3 ha (117 acres)	23.7 ha (58.5 acres) of suitable lands
Greater than ten miles	0	No measures required
Total	**236.3 ha (584 acres)**	**177.6 ha (438.2 acres) with option a; or 153.5 ha (379.2 acres) with option b**

To accomplish part of this mitigation, 97.2 ha (240.5 acres) of grassland habitat will be preserved in perpetuity at Aitken Ranch. This preserved grassland consists of the matrix in which the preserved vernal pools and swales are located, and will be managed for both Swainson's hawk and vernal pool species. The active management of Aitken Ranch for Swainson's hawk will allow option "b" for mitigation acreage requirements to be used; therefore, an additional 56.1 ha (138.7 acres) of Swainson's hawk grassland preservation will need to be provided at another suitable location.

Mitigation Measures for Valley Elderberry Longhorn Beetle

Mitigation for impacts to VELB will be accomplished in accordance with the 1999 FWS Mitigation Guidelines (USDI Fish and Wildlife Service 1999). These guidelines specify that elderberry plants will be avoided whenever possible. If avoidance is not possible, elderberry shrubs will be transplanted. In addition, each elderberry stem measuring greater than one inch in diameter that is impacted (either by removal or transplanting) will be replaced with seedlings or cuttings at a ratio ranging from 1:1 to 8:1. Impacted elderberry shrubs in riparian communities require greater replacement ratios than impacted elderberry shrubs in non-riparian settings. Studies have shown that VELB occur in greater abundance in dense native plant communities with a mixed understory; accordingly, the guidelines require associated natives to be planted at a 1:1 or 2:1 ratio for each elderberry seedling planted. The replanting must occur in a specified conservation area. Elderberry shrubs must be surrounded by a 30.48 m (100 ft) buffer from any disturbance or activity. Firebreaks may not be included in conservation areas or buffer zones. The replanting ratios are summarized in Table 4-27 below.

If the elderberry plants cannot be transplanted, FWS may allow replanting at a higher ratio than stated in the guidelines for each plant that cannot be transplanted. Each transplanted elderberry shrub must be provided with an area of 548.6 m^2 (1,800 ft^2), with a maximum of five elderberry cuttings or seedlings planted within that 548.6 m^2 (1,800 ft^2) area. A maximum of five associated natives may be planted within the same area. Every five additional elderberry seedlings or cuttings and associated natives must be provided with an additional 548.6 m^2 (1,800 ft^2).

The preferred alternative would directly impact two elderberry plants that include ten stems over one inch diameter at ground level. The plants are located in an area where they cannot be avoided without major project modifications that would likely result in other impacts. The elderberry plants are both located along an old breakout channel of Auburn Ravine. Since this area was historically part of a larger riparian system, these plants are considered located within a riparian setting. No exit holes were observed on the plants. Proposed mitigation, consistent with FWS guidelines, is as follows:

1. The two elderberry shrubs which are located within 6 m (20 ft) of the centerline of the proposed alignment will be transplanted to a Service-approved conservation area that will be protected in perpetuity.
2. To compensate for direct affects to the beetle, prior to ground-breaking activities at the project site, Caltrans will establish 29 rooted elderberry seedlings and 29 associated native plants at a Service-approved conservation area.
3. The proposed conservation area is the Aitken Ranch property. The two transplanted shrubs, seedlings and plantings will be established on this property. The minimum area required is 0.10 ha (0.24 ac) to ensure that no more than five elderberry seedlings and five associated native plants are planted per 548.6 m^2 (1,800 ft^2). The conservation area shall be managed and monitored in perpetuity as outlined in the Beetle Conservation Guidelines (FWS 1999).

Table 4-27 Elderberry Mitigation per the Biological Opinion (FWS)

Size Category	No. of Stems	Exit Holes	Ratio	Elderberry Seedlings	Associated Species Ratio	Associated Species Plantings
1" - 3"	3	No	2:1	6	1:1	6
1" – 3"	0	Yes	4:1	0	2:1	0
3" – 5"	5	No	3:1	15	1:1	15
3" - 5"	0	Yes	6:1	0	2:1	0
>5"	2	No	4:1	8	1:1	8
>5"	0	Yes	8:1	0	2:1	0
TOTAL	**10**			**29**		**29**

Mitigation measures for the Central Valley Steelhead and Fall-Run Chinook salmon

In addition to the creation of mixed riparian forest habitat along Auburn Ravine at Aitken Ranch, Caltrans will re-vegetate all temporarily impacted riparian habitat (shaded riverine aquatic habitat) along the sections of Coon Creek and Auburn Ravine that are disturbed by project activities. Trees will be planted along the banks near bridge

structures and within placed riprap, with monitoring to ensure sufficient survival for habitat development. A total of 15.22 ha (3.76 ac) of riparian forest habitat will be replaced on site with 1,504 plantings, consisting of 977 oak saplings/acorns plus 527 other riparian species at a density of 988 trees per ha (400 trees per ac).

Avoidance and Minimization for Natural Communities

1. To the maximum extent feasible, the final project alignment shall be routed to avoid or minimize impacts to high quality natural communities including oak woodland, riparian forest and grasslands with high concentrations of vernal pools.
2. Crossings of Auburn Ravine, Markham Ravine and Coon Creek shall be located where riparian resources are least extensive; crossings shall be aligned perpendicular to the riparian corridor to minimize the crossing impact.
3. Unavoidable impacts to mixed riparian forest shall be offset with a combination of on-site restoration and off-site creation or restoration of riparian forest habitat through in-kind planting of 1 tree sapling per 1" dbh impact for all trees lost; on-site planting will be at a maximum density of 400 trees/acre; off-site planting will be at a maximum density of 242 trees/acre. Overall, this is equivalent to a 4.5:1 ratio. In addition, preservation of existing oak riparian habitat at a 2:1 ratio will be secured to offset permanent loss of mature riparian oak habitat.
4. Unavoidable impacts to oak woodland habitats shall be offset through creation or restoration of oak woodland habitat to accommodate in-kind planting of one oak sapling per 1" dbh of trees impacted at maximum density of 200 trees/acre (equivalent to 2:1 ratio); and (2) preservation of existing oak woodland habitat at a 2:1 ratio. Oak woodland habitat used to offset impacts shall be protected in perpetuity through conservation easement, deed restriction or other equivalent measures.
5. Prior to construction during the spring breeding season, a qualified biologist shall conduct pre-construction surveys of impact areas to check for nesting birds. If nesting activity is detected, construction activities shall avoid nest sites until the biologist determines that the young have fledged or nesting activity has ceased.
6. Drainage shall be passed through the roadway prism via bridge or culvert. Culverts shall be straight (without bends) to facilitate wildlife movements.
7. All significant habitats located outside of construction areas shall be designated as Environmentally Sensitive Areas (ESA) and so designated on construction plans and specifications. No encroachment into ESA shall be allowed.
8. Where feasible, culverts will be designed with characteristics that will be conducive to wildlife movements.

4.8.9 Executive Order 13112: Invasive Species

Executive Order (EO) 13112 requires that federal agencies prevent and control the introduction and spread of invasive species. Federal agencies cannot authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species. To comply with EO 13112 Caltrans will implement the following measures:

- Construction supervisors and managers will be informed of the importance of controlling and preventing the spread of noxious weeds;
- Construction equipment leaving an identified invasive plant area will be cleaned at a designated vehicle wash facility;
- Prior to arriving at the project site, construction equipment (from a noxious weed-infested area or area of unknown weed status) will be cleaned of all attached soil or plant parts at a designated vehicle wash facility;
- Measures set forth in the Stormwater Pollution Prevention Plan (SWPPP) will be implemented to re-vegetate and restore disturbed areas immediately after construction is complete. Re-vegetation will require the use of certified weed-free native and non-native species mixes. The SWPPP will also specify that all disturbed areas will be weeded and reseeded in subsequent years if determined necessary.

4.8.10 Wetlands Only Practicable Alternative Finding

On federally funded projects, impacts on wetlands must be identified in the environmental document and alternatives that avoid wetlands must be considered. There is no avoidance alternative. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific "Wetlands Only Practicable Alternative Finding" in the Final Environmental Document.

Since the determination of the preferred alternative (D13 North Modified) Caltrans has investigated numerous avoidance and minimization measures to reduce potential project impacts to listed species and other biological resources. A number of these measures have been incorporated into the project; these measures are summarized below:

- The footprint of the park and ride lot at the south end of the project will be reduced from 1500 to 200 spaces (with an initial construction of 150 spaces). In addition, the area for future braided ramps will be removed.
- Roadside ditches and side-slopes will be modified to minimize project footprint impacts south of Nelson Lane.
- The proposed interchange at Nelson Lane will be reduced to an at-grade intersection to reduce the project footprint in this area.

- The reach of Yankee Slough that meanders within the roadway footprint will be recreated outside of the roadway footprint to recreate pre-project hydrology and restore vernal marsh habitat on site.
- The height (profile) of the roadway north of North Yankee Slough and Riosa Road will be lowered to reduce the footprint at this location. This change avoids additional impacts from hauling operations.
- Proposed passing lanes will be eliminated at two locations to avoid the need to raise the height of the roadway and increase the footprint.
- The clearance between the catch line and the proposed right-of-way will be reduced from 5.0 m (16.4 ft) to 3.0 m (9.8 ft) on both sides of the freeway throughout the project limits.
- A proposed "v" ditch on both sides of the proposed alignment will be removed to decrease the project footprint.
- The minimum grade will be changed from 0.3% to 0.0 % wherever possible throughout the project limits. This change will decrease the height of the roadway, thus decreasing the side slopes and project footprint.
- A proposed detention basin east of the project corridor, just south of the South Sutter Water District canal, will be eliminated to avoid impacts to vernal pools at this location.
- All wetlands, riparian areas, and other sensitive vegetation/habitats adjacent to designated work areas will be designated as environmentally sensitive areas (ESAs) and clearly indicated as such on project construction plans. Project specifications will include a requirement that ESAs are clearly delineated with brightly colored fencing, rope or equivalent before beginning construction.
- Measures consistent with the current Caltrans' Construction Site BMPs Manual (including the SWPPP and WPCP Manuals [http://www.dot.ca.gov/hq/construc/Construction_Site_BMPs.pdf]) will be implemented to minimize erosion and runoff during construction.
- Storm water runoff from the proposed roadway will be collected and routed into water treatment systems (e.g., bioswales, biostrips, or detention basins) before discharging into drainages in the project area.

All practicable measures to minimize harm have been implemented. Based upon the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

4.9 CULTURAL RESOURCES

A cultural resources inventory resulted in the identification of fifteen archaeological resources and the evaluation of eight pre-1946 architectural resources. The Historic Architectural Survey Report (HASR) and the supplemental HASR (completed in 1989 and 1990) evaluated a total of eight properties, two of which were determined to be potentially eligible for listing in the NRHP: the Fickewirth Ranch and the Sheridan Cash Store (a.k.a. Country Store). Two additional properties in the vicinity of the project have been listed on the National Register since 1990; the Lincoln Public Library at 590 Fifth Street (listed 12/10/90) and the Women's Club of Lincoln at 499 E Street (listed 5/30/01). Both of these buildings are within the town of Lincoln and not directly affected by the project.

In the Supplemental HASR (dated August 1990), 39 properties were treated in accordance with the December 20, 1989 "Memorandum of Understanding Regarding Evaluation of Post-1945 Buildings, Moved Pre-1945 Buildings, and Altered Pre-1945 Buildings." Of the 39 properties, 21 do not predate 1957 and thus require no further study. The remaining eighteen properties predate 1957 and were formally evaluated and determined to not be eligible for listing in the NRHP. The application of "Caltrans Interim Policy for the Treatment of Buildings Constructed in 1957 or Later" was documented in a statement of findings in the Supplemental HASR completed in September 2002. Appendix D contains the letters from SHPO.

Four of the archaeological finds were adjacent to, but outside of, the project study area and were not considered further. Eight of the remaining eleven archaeological resources were recorded as isolated finds or features and three were recorded as archaeological sites. Two of these three sites are considered potentially eligible for inclusion in the National Register of Historic Places (NRHP) until they have been evaluated for significance.

These two sites are potentially affected by the AAC2 alignment. The alignment passes through one of the sites and is in close proximity to the other. If the AAC2 alternative were chosen as the preferred alternative, the first site would have been tested for significance and eligibility for listing in the NRHP. An assessment of the impacts on this site cannot be made until the deposit has been evaluated.

Preliminary plans indicate that the third site will not be directly impacted by the proposed construction. As a result, the site will be designated as an environmentally sensitive area (ESA) to ensure its protection. If design plans are modified such that the site is impacted, it will be tested for significance for listing in the NRHP, and an assessment of the effects would be made at that time.

Two of the eight architectural resources were determined eligible for the NRHP by consensus of the State Historic Preservation Officer (SHPO) on October 21, 1991; the Fickewirth Ranch and the Sheridan Cash Store. Copies of the correspondence with SHPO can be found in Appendix D.

The Sheridan Cash Store is adjacent to A5C1, AAC2, D1, and D13, but will not be affected by any of these alternatives. The storefront sits approximately 24 m (80 ft) from the pavement edge of SR 65. This distance will not change if the highway is relinquished to the county, nor will additional right-of-way be required for any potential road improvements near the store. Traffic and its attendant noise are likely to decrease if any of the longer build alternatives are selected.

The eligibility of the Sheridan Cash Store under Criterion A is based on its association with Sheridan's economic development and for embodying the characteristics of its time, period or method of construction. The brick false-front store was designated a Point of Historical Interest by the California Historic Resource Commission on August 3, 1990, by virtue of being the only remaining commercial brick building in Sheridan. No new elements will be introduced into the setting; thus none of the proposed alignments will alter the characteristics of the property that qualify it for the NRHP.

The Fickewirth Ranch is located at 2780 Dowd Road, approximately 4.8 km (3.0 mi) south of the town of Sheridan. The property consists of a residence, a tank house, a windmill, a long shed (originally a chicken house), a timber-framed hay barn, a one-time blacksmith shop and several smaller miscellaneous sheds. The residence and most of the outbuildings were constructed in 1901. The house was originally built as a one-story Queen Anne cottage; a second story was added about 1912. The buildings on the property have been maintained in their original form with little or no modification. Materials used to maintain the property were of the same kind as the original, thereby serving to preserve the original character and integrity of the farm complex. The house is one of the earliest intact residences remaining in the local area.

Mr. and Mrs. Fickewirth currently own the ranch. The property is approximately 1524 m by 762 m (5000 ft by 2500 ft).

The Fickewirth Ranch has been determined eligible for the NRHP at the local level under Criterion C as an embodiment of its time, period, and method of construction. All of the structures on the property, in their form and function, contribute to this determination. Furthermore, the property remains in its rural setting.

Alternatives D1 and D13 and A5C1 would require a portion of the Fickewirth Ranch. The Department's and the FHWA, in applying the Criteria of Effect and Adverse Effect (36 CFR 800.9) have concluded that a "Finding of No Effect" is appropriate for

each of the three alignments going through this property, and have obtained SHPO's concurrence on this determination. SHPO concurred with this determination on January 30, 1995. Copies of this correspondence can be found in Appendix D.

On February 2, 2006, Caltrans sent a letter to Mr. Wayne Donaldson, State Historic Preservation Officer (SHPO), seeking his office's concurrence in the substitution of a finding of "no adverse effect" pursuant to revised regulations issued by the Advisory Council on Historic Preservation (ACHP) (36 CFR Part 800), to replace the 1995 finding of "no effect," a term not found in the current ACHP regulations. The SHPO concurred in this finding on February 16, 2006. Both letters may be found in Appendix D.

The letter also advised the SHPO that his office's concurrence in FHWA's determination of no adverse effect could serve as the basis of a finding of *de minimis* impact under Section 4(f) of the Department of Transportation Act of 1966, 49 U.S.C. 303. Under the 40-year-old provisions of Section 4(f), the Secretary of Transportation may not use land from a property on or eligible for the National Register of Historic Places unless there is 1) no prudent and feasible alternative to the use of that land and 2) the Secretary has undertaken all possible planning to minimize harm to the historic property. Under a recently enacted amendment to Section 4(f), however, that statute will be considered satisfied if the project would result in a *de minimis* impact on the protected property. For historic sites, the new law states that the Secretary may find such a *de minimis* impact if consultation with the SHPO results in a determination that a transportation project will have "no adverse effect" on the historic site or that there will be "no historic properties affected" by the proposed project. With regard to the Fickeworth Ranch, the SHPO has concurred in the FHWA's determination of "no adverse effect" as the result of the "strip takes" contemplated by Alternatives D1, D13, and A5C1. Accordingly, the provisions of Section 4(f) would be considered satisfied should any of these alternatives be selected.

4.9.1 Application of the Criteria of Effect on the Fickewirth Ranch

Alternatives A5C1, D1 and D13 pass through the 104 ha (258 ac) agricultural parcel containing the Fickewirth Ranch. The proposed alignment for Alternative A5C1 lies approximately 457 m (1500 ft) from the ranch complex, while Alternative D1 and D13 are about 610 m (2000 ft) from the buildings. The elevation drops approximately 1.5 m (5 ft) between the building complex and each of the alignments. The proposed highway for these two alternatives will not be seen from the building complex, although vehicles on the highway will be visible. A similar condition would exist for the A5C1 alternative. Furthermore, the view of the alignments would largely be blocked from the Fickewirth residence by the surrounding outbuildings.

Projected traffic counts on this section of the proposed freeway are anticipated to be relatively low. A noise level projection model found that any increase in sound would be well below the criteria level of a significant noise impact as the minimum distance of 183 m (600 ft) from the ranch complex. The proposed alternatives are all at a much greater distance; thus, the increase in noise from the new highway will be negligible. Furthermore, because it is located immediately adjacent to Dowd Road, traffic and its attendant impacts have always been a factor in the setting of the ranch complex. The addition the proposed freeway at a distance of 457 to 610 m (1500-2000 ft) will not create elements that did not previously exist.

The eligibility of the Fickewirth Ranch is based on the type and period of the building complex. As no new elements would be introduced into the setting of the property, none of the alignments would alter any characteristic of the property that qualifies it for the National Register of Historic Places. Thus, the proposed project will have no adverse effect on the Fickewirth Ranch.

4.10 HAZARDOUS WASTE

The preferred alternative (D13 North Modified) proposed project work scope involves yellow traffic stripe removal at the beginning and end of the project limits, as well as the limits of work within all the local roads.

The preferred alternative requires the acquisition of several parcels. A record search dated January 5, 2004 and an updated Initial Site Assessment dated February 26, 1999 was reviewed. With the exception of two suspected contaminated parcels, no hazardous waste is expected to be encountered within the proposed parcels to be acquired. Access was denied to the suspicious properties, however; approximate clean up costs for hazardous waste could be as much as one million dollars.

Two parcels are expected to contain soil and groundwater hazardous waste contamination and other unknown contaminants. Access was denied to these property, but approximate clean up costs for hazardous waste could be as much as one million dollars. A hazardous waste Preliminary Site Investigation (PSI) is required to evaluate the condition of those properties and the need for avoidance and/or clean-up prior to acquisition.

Any building or other structure to be acquired will be evaluated for the presence of asbestos and lead-based paint. Due to the agricultural nature of the area, many of the parcels contain above ground storage tanks, which will require a PSI. In addition, many of the residences are equipped with septic systems; unknown conditions relating to the septic systems may exist.

Due to the former use of waste oil, potentially containing polychlorinated biphenyls (PCB's) to control dust in the railroad right-of-way, the railroad areas within the alignment could contain PCB affected soil as well as lead and/or diesel. These areas will require a PSI.

4.10.1 Avoidance and Minimization Recommendations

Avoidance and Minimization Measure: Survey and sampling analysis for Asbestos containing Materials & Lead-based paint

Comprehensive asbestos and lead-based paint surveys that meet the requirements of current EPA and OSHA regulations are will be implemented prior to any demolition activities associated with structures in the proposed alignment corridor. Any component that is impacted by demolition activities will be characterized to ensure proper handling and disposal.

Avoidance and Minimization Measure: Sampling and Testing of Yellow Traffic Striping along Existing Roadway

Depending upon the road widening/connection option used, yellow striping along existing SR 65 may require removal. However, if striping paint is to be removed or impacted in any manner, sampling and testing of the yellow striping scheduled for removal will be performed to determine the presence of lead and the need for mitigation prior to or during construction if the lead content is above the regulatory thresholds. A Lead Compliance Plan and a Health and Safety Plan will be prepared to address worker safety when working with potentially lead-bearing paint.

Avoidance and Minimization Measure: Sampling and Analysis of Transformer Fluid from Electrical Transformers.

A site reconnaissance indicated the presence of pole mounted electrical transformers that are potential sources of PCB's. If leaks from electrical transformers that either will remain within the project construction zone or will require removal and/or relocation are encountered before or during construction, the transformer fluid will be sampled and analyzed by qualified personnel for detectable levels of PCBs. If PCBs are detected, the transformer will be removed and disposed of in accordance with regulatory agency requirements. Any stained soil encountered below electrical transformers with detectable PCBs levels will also be handled and disposed of in accordance with regulatory agency requirements. It is anticipated that, with the current standard of care, removal of any transformers for the project will not pose a significant hazardous materials risk.

Avoidance and Minimization Measure: Testing for Aerially Deposited Lead in Surface/Near-Surface soils.

A preliminary investigation and screening for ADL will be performed along the proposed project. Segments that will encroach/connect into existing SR 65 State Right-of-way shall be screened in order to determine the levels of lead in soil. Should ADL be encountered above regulatory thresholds, the soil will be handled and/or disposed of in accordance with regulatory agency requirements. A Lead Compliance Plan and a Health and Safety Plan will be prepared to address worker safety when working with potentially lead-bearing soils.

Avoidance and Minimization Measure: Soil and Groundwater sampling for hazardous waste contaminants.

A preliminary investigation and screening for soil and groundwater impacts from hazardous materials or wastes and/or petroleum hydrocarbons on a site-specific basis will be performed prior to acquisition in order to determine the levels of contamination. Should soil and or groundwater contamination be encountered above regulatory thresholds, the soil will be handled and/or disposed of in accordance with regulatory agency requirements. A Health and Safety Plan shall be prepared to address worker safety when working with potentially contaminated soils; Special Provisions apply to this type of project.

4.11 VISUAL RESOURCE IMPACTS

Visual character within the Study Area is changing due to planned growth as indicated in the Lincoln General Plan, Land Use Map (refer to Chapter 3 Affected Environment; Social, Economic and Land Use Section). Eventually, as more land becomes developed in this corridor, the rural visual quality will slowly transform into urban build-out. Development diminishes visual quality and character due to soundwalls and structures built adjacent to the right-of-way.

The D13 North Modified alternative is expected to result in similar visual impacts as the other D alternatives. All six alignments begin in the same general location, approximately 1.6 km (1 mi) south of the City of Lincoln. The alignments then cross over the UPTC railroad tracks and pass through west Lincoln where development is occurring. A park and ride site is planned slightly north of the overhead between the UPTC railroad tracks and existing SR 65. The large overhead (also known as an overpass) will provide expansive panoramic views from the roadway. Views from the overhead will provide a variety of visual elements, such as the City of Lincoln,

pastureland, creek corridors, and oak woodland, the Sierra Nevada, Sutter Buttes and Coast Range.

This overhead could provide areas for planting on its soil-covered slopes. Once plantings mature, trees will provide an important visual vertical element. Once development and build-out occurs, this overhead may become the gateway to the City of Lincoln. It is very important to have an aesthetically pleasing, architecturally interesting structure since the overhead will dominate over surrounding uses, becoming a prominent visual feature.

All of the alignments, except for D1, break up a small cluster of rural home sites at the bend in Moore Road. This disrupts the unity and harmony of such enclaves and may lead to viewer confusion. It may be necessary to screen residences from the proposed highway. Screening methods include dense plantings for screening and barriers, possible soundwalls for noise attenuation and/or fencing with wood slats. A landscape architect will suggest the most feasible and appropriate screening method.

In and around Moore Road and Auburn Ravine is predominantly oak woodland. All the alignments run through this fading piece of California heritage land, causing the removal of prime oak habitat. California white oaks, also known as valley oaks, are the predominant species. Minimization of impacts to these heritage oak trees is of prime importance.

All of the alignments traverse Auburn Ravine. The bridge crossing Auburn Ravine will be integrated into existing landforms with a simple, clean and aesthetically pleasing design. If the channel needs to be relocated, its banks will be replanted with native species and restored to its existing conditions. This creek corridor provides a prime location for oak plantings.

The AC corridor

The **AAC2** and **A5C1** pull away from SR 65 approximately 322 km (200 ft) farther northward causing a wider bend to the west. After crossing Ingram Slough, these alignments remove part of the Aitken Ranch Turkey Farm, causing the removal of three buildings and divide the rural home sites on Moore Road.

The AAC2 and A5C1 alignments continue northwest, requiring a second railroad overhead before tying into existing SR 65. This overhead is very similar to the first overhead where the Lincoln Bypass pulls away from existing SR 65. However, northbound views now show the rural nature of the foothills, the Sierra Nevada, Sutter Buttes, Coon Creek and nearby agriculture along with the rural community of Sheridan. Just before the Lincoln Bypass ends, the four-lane expressway narrows down into a two-lane highway and ties into existing SR 65. The Joiner Ranch Project Area to the east of

the AC corridor is rapidly developing. Figure 4-6 illustrates the typical height, size, color and location of a soundwall that may occur along the Lincoln Bypass. Since the circulation of this draft document, many homes on the South end of the project have been constructed or are in various stages of being built. The photograph depicted in Figure 4-9 has changed and now contains several houses.

From this key view, the height of the soundwall will obliterate most views of existing oaks in the background. However, oak tree replacement may occur adjacent to freeway soundwalls. This simulation shows mature oak trees. However, one must also remember that in the future, this area will be completely developed to the soundwall.

The **A5C1 and AAC2** alignments begin approximately one-half mile north of Nicolaus Road with a wide gradual northwest curve. Both alignments follow the same route for approximately two miles before breaking apart south of Coon Creek, passing through vernal pools for approximately 4.8 km (3 mi) between Nicolaus and Dowd Roads.

Alignment **AAC2** connects into the AA alignment north of the Nicolaus Road interchange and Markham Ravine, near the power lines on the Foskett property, following the same route as A5C1 until the Nader Ranch. After the Nader Ranch, AAC2 curves northward in a wide, gradual curve and crosses Coon Creek approximately 243 m (800 ft) upstream from the A5C1 alignment. By going between oak clusters, this alignment promotes more of the feeling of crossing from one area and entering another area.

Figure 4-6 Visual Simulation

After crossing Coon Creek, **A5C1** curves widely through agricultural lands, with an overcrossing at Dowd Road. Rural ranches and meandering creek corridors are visible to the east while traveling through the relatively flat terrain. Two bridges are needed for Yankee slough and Dalby Road will be realigned. A5C1 gradually rises into the unique mile-wide foothill that was described in Chapter 3. An interchange is planned for Riosa Road.

The D corridor

The **D1 and D13** alignments, including the D13 North Modified, veer west of the Lincoln Municipal Airport. Both D1 and D13 present negative views for residents of the rural subdivision on Rockwell Lane. These residents now have panoramic rural views of Markham Ravine and agricultural areas to the south. Once the bypass is built, head and taillights will be the most dominant visual intrusion to the south.

After curving to the northwest, crossing Ingram Slough and cutting through the corner of Aitken Farms, the **D13** alignment breaks up the small rural cluster of home sites at the bend in Moore Road. After crossing Auburn Ravine, it then curves gradually to the west. This section of the proposed alignment provides exceptional views of sunrises and sunsets.

The Nelson Road interchange provides changes in topography while also allowing oak restoration areas. D13 parallels the rural Rockwell Lane subdivision. The closest structures within this rural subdivision are a minimum of 457 m (1500 ft) away from the D13 alignment. Even though this rural subdivision diminishes the integrity of the natural visual setting, it provides a middle ground focal point. This 457 m (1500 ft) distance retains the visual quality of this rural subdivision, both from the residents' viewpoint and for users of the Lincoln Bypass.

Alignment D13 then widely curves to the north, crossing Markham Ravine. The bridge should be simple; complimenting existing landscapes through color, size, form, texture and an aesthetically pleasing architectural design as previously discussed. In addition, a small triangular portion of land adjacent to the creek crossing could be used for oak tree replacement. Additional plantings along the creek corridor could provide areas for oak replacement while also augmenting receding oak populations. This wide curving alignment straightens out near Nicolaus Road where a future overcrossing is planned. D13 then continues northward through agricultural areas until it combines with the D1 alignment.

The major difference between the D alignments is that D1 is slightly farther northward, disrupting the rural Rockwell Lane subdivision. Two home sites would be demolished and other homes may be as close as 30.5 to 76 m (100 to 250 ft) away from the proposed alignment.

The pooling, tributary area of Markham Ravine on the south side of the proposed D1 alignment allows attractive views for Lincoln Bypass travelers during the wet months. In addition, this alignment cuts through the southern tip of a long eucalyptus windbreak, adding an immediate vertical visual element directly adjacent to the right-of-way.

D1 has the same overall visual qualities of D13 except for the area near Auburn Ravine. The rural neighborhood at the bend in Moore Road is now entirely on the north side of the proposed route. Visually and socially, it is wise to not break up this neighborhood. By leaving the enclave of homes intact, the foreground views of rustic home sites tucked inside oak woodland provide visual integrity and promote the rural quality of this region. Once development occurs, the rural home sites may disappear, leaving mixed-use development. D1 joins with D13 just past Nicolaus Road.

All of the longer alignments **(A5C1, AAC2, D1 and D13**) generally cross the same area from Wise Road on to where they join with existing SR 65. These alignments either cross over or weave through small hills north of Coon Creek. These low-lying foothills exaggerate the feeling of traveling and passing through an area due to their vertical relief upon otherwise horizontal fields. The alignments cross extensive vernal pools, agriculture and non-native grasslands for over 2.4 km (1.5 mi) before arriving at the unique, mile-wide rolling foothill between Dalby and Riosa Rds.

Even though these alignments tie into existing SR 65 at different locations before reaching the Bear River, they are within 457 m (1,500 ft) of each other. The D1 and D13 alignments go through existing fruit and nut orchards whereas A5C1 and AAC2 do not. Disturbing the existing orchards and their geometric plant spacing will cause the visual quality and character to be altered. However, orchards normally create interesting, geometric views from the roadway.

4.11.1 Avoidance and Minimization Measures to Reduce Visual Impacts

These measures encompass the enhancement of positive effects as well as the reduction or elimination of negative effects. The goal is to restore the indigenous appearance to areas affected by construction and to form the highway so it blends into adjacent terrain. In achieving this goal, the highway should appear to be a part of the natural landscape. The most effective measure is to minimize and avoid project impacts by designing the project with as little disturbance to the land as possible.

Oak Resolutions and Regulations

The California Senate passed a resolution effective September 1, 1990 protecting heritage oak stands. State agencies shall “assess and determine the effects of their land use decisions or actions within any oak woodlands.” State agencies should "preserve and protect native oak woodlands to the maximum extent feasible... or provide for

replacement plantings" according to SCR17. There are eight stands of oaks meeting the criteria as heritage trees within the Study Area. In addition, Placer County adopted a tree preservation ordinance in October of 1991. This ordinance was established to preserve and protect the remaining native oak and other species of trees within Placer County. Within the project area, landmark trees and trees within a riparian zone provide the majority of trees affected by this ordinance.

Oak Removal

Tree removal will be kept to a minimum. Because of the loss in change of spatial enclosure and the number of heritage oak stands, it is particularly important to leave existing trees as close to the highway as safety will allow. Prior to clearing operations, trees needing to be removed will be individually marked for cutting and all other trees will be protected from damage. Identification of a preferred alignment is not an easy task due to many constraints, some of which include oak preservation, wetland habitats, potential endangered species and scenic quality considerations. All proposed alignments remove portions of existing mature oak woodlands. The total dbh varies between the alignments but D1 has the least oaks being removed and AAC2 has the most oaks being removed. Below approximates total oak removal for each alignment:

D1 alignment	17.8 m (700 in) of oaks to be removed
D13 alignment	43.2 m (1,700 in) of oaks to be removed
A5C1 alignment	68.6 m (2,700 in) of oaks to be removed
AAC2 alignment	85.1 m (3,350 in) of oaks to be removed

Oak Replacement

Replacement of oak woodland habitat will be necessary under SCR 17 for the Lincoln Bypass. It is best to locate replacement trees in areas where existing oaks have been removed. Creek corridors also provide an exceptional location to augment existing oak woodlands with additional replacement oaks. In addition, wider rights-of-way allow naturalistic arrangement of replacement oaks while also enhancing visual quality and character. Caltrans Landscape Architects will provide re-vegetation plans, which will further enhance the Lincoln Bypass. More information on oak woodland replacement can be found in Section 4.8.8.

Vegetation Preservation

The natural vegetative layers of tree canopy, understory vegetation of small trees and shrubs, groundcovers, native grasses and natural mulches will be re-established.

4.11.2 Erosion Control

Potential damage from erosion and runoff can be severe. Sedimentation barriers such as simple hay bales or soil filter fabrics attached to fences (silt fences) can help prevent erosion. To establish effective re-vegetation on slopes, topsoil will be collected from the project site before construction, stockpiled, and later applied to the completed slopes. Erosion control plans can be custom-tailored to specific sites by a landscape architect. Erosion control is discussed in depth in the Water Quality Section of this chapter.

If re-vegetation is not accomplished, roadside scars will become prominent on cut and fill slopes. The magnitude of these visual impacts depends upon how the slopes are treated. All slope treatments will blend with existing features, simulating natural forms. This consists of rounding the top and edges of the cuts and fills to present a softer transition line between constructed and existing slopes. Particularly where a significant tree or group of trees can be saved, slopes could be cut steeper to preserve them. In addition, slopes will be designed to be flat enough to readily re-vegetate them. A 4:1 slope is recommended. This means that for every four feet of horizontal length the slope will rise vertically one foot.

Contour grading may increase the overall size and length of graded areas, requiring adequate right-of-way to be wider than the 70 m (230 ft) as proposed. The unique, mile-wide foothill near Dalby and Riosa Roads is a prime example where contour-grading principles will be employed along with establishing wider right-of-way, smoothing the natural to standard transition edge along the roadway.

Bridges and Other Structures

Special attention will be given to structures since they have a strong impact on the visual quality of a highway. All structures will be aesthetically pleasing when viewed from the road and other viewpoints. Landforms will blend into bridge abutments to maintain visual continuity for the motorist. Structures will complement the natural landscape in color and not dominate existing landforms.

Soundwalls

Soundwalls are an important element in highway design where homes and other noise-sensitive properties are close to the right-of-way. The compatibility between highways and residential areas is substantially improved by the provision of attractively designed soundwalls. Planting is effective in complementing and softening the appearance of soundwalls. Visual impacts must be considered once final locations of soundwalls are determined.