3.13 Air Quality

3.13.1 Affected Environment

The proposed project is located in the Northern Sacramento Valley Air Basin, which includes Shasta, Tehama, Glenn, Butte, Colusa, Sutter, and Yuba counties. Air quality in the basin is regulated under the authority of both the federal Clean Air Act and the California Clear Air Act with the Tehama County Air Pollution Control District as the local agency responsible for regulating air quality in Tehama County. Pursuant to the federal Clean Air Act of 1970, EPA has established national ambient air quality standards (NAAQS) for several major pollutants. Pollutants of primary concern for this project are ozone and its precursors, and particulate matter less than 10 microns in aerodynamic diameter (PM_{10}). The State of California has established ambient air quality standards pursuant to the California Clean Air Act (see Table 3.13-1).

TABLE 3.13-1
State and National Ambient Air Quality Standards

			Federal Standard	
Pollutant	**Averaging Time**	**State Standard**	**Primary Standard**	**Secondary Standard**
PM_{10}	~~Annual Geometric Mean~~ 24-hour	~~30~~ 50 µg/m^3	150 µg/m^3	Same as primary
	~~24-hour~~ Annual Arithmetic Mean	~~50~~ 20 µg/m^3	~~150 µg/m^3~~ ---	Same as primary
Ozone	~~Annual Arithmetic Mean~~ 1-hour	~~---~~ 0.09 ppm (180 µg/m^3)	~~50 µg/m^3~~ ---	Same as primary
~~Ozone~~	~~1~~8-hour	~~0.09~~ 0.070 ppm (~~180~~ 137 µg/m^3)	~~0.12~~ 0.08 ppm (~~235~~ 157 µg/m^3)	Same as primary

ppm = parts per million.
µg/m^3 = micrograms per cubic meter.

Currently, Tehama County is not in attainment with the state standard for PM_{10} and ozone. Tehama County is in attainment with all the federal ambient air quality standards, including the federal PM_{10} standard~~,~~ and ~~was in~~the federal ozone standard. The County's attainment status with ~~the federal 1-hour ozone standard. Recent monitoring suggests that the area would not be in attainment with the federal 8-hour ozone~~respect to the federal $PM_{2.5}$ standard~~. Because of this status, the County Air Pollution Control District has developed an Air Quality Attainment Plan. The intent of this plan~~ is ~~to implement control strategies for the County to bring the air district into a level of attainment~~currently unclassified and, therefore, considered in attainment. Table 3.13-2 shows the attainment status for Tehama County.

Ozone is a pollutant formed through a complex series of temperature-dependent photochemical reactions involving precursor pollutants such

as nitrogen oxide (NO_x) and reactive organic gases (ROG) also referred to as volatile organic compounds (VOC). High ozone concentrations typically occur during multi-day periods of hot, sunny days accompanied by stagnant weather patterns. Under these conditions, pollution from outside the region is transported into the area, compounding the problem. This makes ozone a regional-scale pollutant and can affect rural areas outside major metropolitan areas.

TABLE 3.13-2
Tehama County Attainment Status

Pollutant	Attainment with State Standard?	Attainment with Federal Standard?
CO[a]	Yes	Yes
PM_{10}	No	Yes
$PM_{2.5}$[b]	---Unclassified	---Unclassified
Nitrogen Dioxide[b]	Yes	Yes
Ozone	No	Yes~~/No~~[e]
SO_2[b~~d~~]	Yes	Yes
Other	Yes	Yes

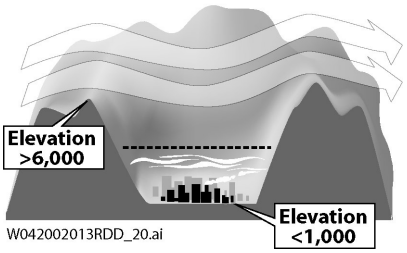
[a]Carbon monoxide.

~~[b]Attainment status for $PM_{2.5}$ will not be determined until the year 2005.~~

~~[e]The area was in attainment with the old federal 1-hour standard. Recent monitoring suggests that the area would not be in attainment with the new federal 8-hour standard.~~

[b~~d~~]Sulfur dioxide.

Pollution Concentration



The topography of the basin enhances the accumulation of ozone. Mountain ranges surrounding the Tehama County area reach heights of over 6,000 feet, making a barrier to locally created pollution as well as pollution transported northward from the Sacramento metropolitan area. Because of these conditions, the valley portion of the air basin (i.e., those areas below Elevation 1,000 feet) is often subjected to temperature inversions that restrict vertical mixing and dilution of pollutants.

~~In 1996, EPA promulgated~~promulgatedThe California Air Resources Board conducted a ~~new 8-hour standard for ozone (61 Federal Register 65752, December 3, 1996) to replace the previous 1-hour ozone standard. When this rule took effect, the County was in attainment with the old federal 1-hour standard. Table 3.13-3 shows 1-hour ozone concentrations at the Red Bluff Oak Street monitoring site and the Tuscan Butte monitoring site. However, recent monitoring suggest that the area may not be in attainment with the new federal 8-hour standard. The attainment status for this area is not yet available for the year 2000. The California Air Resources Board conducts a~~ basinwide study to quantify the relative contributions of local emissions, upwind transported emissions, and non-local vehicle emissions to exceedances of the

California ozone standard in Tehama County. The major finding of the 2000 study was that substantial transport of ozone and ozone precursors from the broader Sacramento Valley ~~was~~has been responsible for Tehama County's ozone violations. The study also concluded that localized pollution sources by themselves did not ~~exceed~~cause exceedances of the ozone standard.

Tehama County's emissions are a small part ~~(around 4.7 percent)~~ of the entire Sacramento Valley emissions inventory. ~~It is clear from this study that sources in Tehama County do not cause ozone violations.~~ Table 3.13-~~3~~4 shows the criteria pollutant emissions inventory for Tehama County in relation to the overall air basin. Natural source emissions make up a significant portion of the emissions.

TABLE 3.13-~~3~~4
2000 Estimated Annual Average Emissions—Tehama County

	Emission in Tons/Day							
	TOG[a]	ROG	CO	NO_x	SO_x[b]	PM	PM_{10}	$PM_{2.5}$
Stationary Sources	2.9 ~~2.74~~	1.3 ~~1.35~~	1.3 ~~1.12~~	1.7 ~~1.05~~	0.1 ~~0.01~~	1.6 ~~0.74~~	0.9 ~~0.45~~	0.5
Areawide Sources	21.4 ~~3.87~~	3.6 ~~2.44~~	15.7 ~~15.97~~	0.3 ~~0.31~~	0.0 ~~0.06~~	23.2 ~~24.02~~	13.6 ~~14.15~~	3.5
Mobile Sources	4.8 ~~5.76~~	4.4 ~~5.26~~	30.3 ~~48.52~~	17.6 ~~9.62~~	0.2 ~~0.66~~	0.8 ~~0.42~~	0.8 ~~0.42~~	0.7
Natural Sources	87.7 ~~1.07~~	70.8 ~~0.60~~	170.1 ~~14.91~~	5.3 ~~0.65~~	1.6 ~~-~~	18.0 ~~3.00~~	17.3 ~~2.89~~	14.7
Total	**116.8** **~~13.44~~**	**80.1** **~~9.65~~**	**217.3** **~~80.52~~**	**25.0** **~~11.62~~**	**2.0** **~~0.73~~**	**43.5** **~~28.18~~**	**32.6** **~~17.91~~**	**18.3**
Sacramento Valley Air Basin Total	**872.1**	**578.2**	**1538.1**	**302.7**	**9.3**	**443.8**	**266.7**	**107.2**

[a]Toxic organic gases.
[b]Sulfur oxide.
Source: California Air Resources Board, ~~2000~~2006, Emissions Inventory.
~~http://www.arb.ca.gov/emisinv/emsmain/emsmain.htm~~

In 1996, EPA promulgated a new 8-hour standard for ozone (61 Federal Register 65752, December 3, 1996) to replace the previous 1-hour ozone standard. When this rule took effect, the County was in attainment with the old federal 1-hour standard. At this time, the County is also in attainment with the new 8-hour standard for ozone. Table 3.13-4 shows 1-hour ozone concentrations at the Red Bluff Oak Street monitoring site and the Tuscan Butte monitoring site.

TABLE 3.13-~~43~~
Ozone Monitoring at Red Bluff Oak Street and Tuscan Butte

Location	Year	High 1-hour Ozone (ppm)	Second High 1-hour Ozone (ppm)
Red Bluff – Oak Street	2006 ~~1999~~	0.094 ~~0.110~~	0.090 ~~0.110~~
Red Bluff – Oak Street	2005 ~~1998~~	0.090 ~~0.120~~	0.089 ~~0.120~~
Red Bluff – Oak Street	2004 ~~1997~~	0.085 ~~0.100~~	0.083 ~~0.090~~
Red Bluff – Oak Street	2003 ~~1996~~	0.102 ~~0.090~~	0.099 ~~0.090~~
Tuscan Butte	2006 ~~1999~~	0.099 ~~0.128~~	0.099 ~~0.114~~
Tuscan Butte	2005 ~~1998~~	0.098 ~~0.120~~	0.095 ~~0.108~~
Tuscan Butte	2004 ~~1997~~	0.097 ~~0.101~~	0.096 ~~0.092~~
Tuscan Butte	2003 ~~1996~~	0.100 ~~0.108~~	0.099

~~Table 3.13-5 shows monitoring data for PM_{10} at the Red Bluff Riverside Drive monitoring stations.~~

~~Residential woodstove and fireplace use during wintertime inversion conditions is the major contributor of stationary source PM_{10}.~~

~~Mobile source emissions make up a significant portion of the ROG and NO_x emissions. Unpaved road emissions (areawide source) make up most of the PM_{10} emissions.~~

Residential woodstove and fireplace use during wintertime inversion conditions is the major contributor of stationary source PM_{10}. Unpaved road emissions (areawide source) make up most of the PM_{10} emissions. Table 3.13-5 shows monitoring data for PM_{10} at the Red Bluff Riverside Drive monitoring stations. There are no $PM_{2.5}$ monitoring stations in Tehama County.

TABLE 3.13-5
PM_{10} Monitoring at Red Bluff Riverside Drive

Location	Year	High 24-hour PM_{10} (µg/m^3)	Second High 24-hour PM_{10} (µg/m^3)	Days > 24-hour State Standard	~~Annual PM_{10} (µg/m^3)~~	~~Days > Annual State Standard~~
Red Bluff – Riverside Drive	2006 ~~1999~~	70.0 ~~98.0~~	66.0 ~~75.0~~	4 ~~8~~	~~28~~	~~48~~
Red Bluff – Riverside Drive	2005 ~~1998~~	41.0 ~~119.0~~	40.0 ~~67.0~~	0 ~~8~~	~~21.3~~	~~48~~
Red Bluff – Riverside Drive	2004 ~~1997~~	57.0 ~~58~~	55.0 ~~52~~	2	~~19~~	~~12~~
Red Bluff – Riverside Drive	2003 ~~1996~~	58.0 ~~56~~	46.0 ~~49~~	1	~~22.3~~	~~6~~

3.13.2 Environmental Consequences

This section provides a discussion of the consequences of the project alternatives on air quality as compared to the No Action Alternative.

Methodology

~~Air quality impacts of the various alternatives were evaluated by determining the worst-case emission for each process. Vehicle emissions were calculated using the URBEMIS 7G computer model. The direct project emission and total project~~

Tehama County Air Pollution Control District does not have any established emission thresholds for determining the significance of construction projects. However, emission estimates were calculated and provided below for information purposes only. To estimate the maximum daily construction emissions, emissions ~~were compared to the first-tier trigger thresholds. The fugitive dust emissions~~ of each pollutant were calculated ~~from the CEQA equation:~~

~~$E_{ce}(lbs/day) = 0.77 tons/acre/month * acres$~~ ~~Diesel- and gasoline-powered vehicle exhaust contains CO, ROG, NO_x, SO_x, and PM_{10}. Exhaust emissions from worker vehicles traveling to and from the site and onsite~~ for the individual construction activities ~~were considered. For the onsite construction vehicles, the daily emission rates were estimated based on the projected amount~~ of ~~material removed and added for the project, assuming~~ each ~~phase of the project takes 60 days. Specifically, the~~ alternative (for example, Mill Site, Conveyance Facility, and Bypass). It was assumed that none of the construction activities or phases would occur simultaneously. The worst-case daily emissions ~~from construction exhaust (E_{ce}) were assumed to be:~~

~~$$E_{ce}(lbs/day) = \frac{M(CY) * EF(g/CY)}{60days * 454(g/lbs)}$$~~

~~Where M is the total amount of material removed and added (in CY), EF is the pollutant-specific emission factor from the Bay Area Air Quality Management District CEQA Guidelines.~~

~~The maximum number~~ were determined by selecting the maximum emissions of ~~vehicle trips was considered, and emissions were estimated using the URBEMIS 7G computer software. During the peak of~~ each construction activity~~, it was assumed that there would be 20 workers, each with his or her own car and a maximum of three trucks per day. The URBEMIS 7G program requires the number of one-way trips, so the number of one-way trips is double the number of vehicles.~~. ~~Additionally, thresholds were established to determine significance and are shown in Table 3.13-6.~~

~~TABLE 3.13-6~~
~~Thresholds for Determining Significance~~

~~Pollutant/Source~~	~~Threshold~~	~~Applicable Rule~~
~~CO~~	~~550 lb/day~~	~~PSD~~
~~NO_x~~	~~219 lb/day~~	~~PSD~~
~~PM_{10}~~	~~82 lb/day~~	~~PSD~~
~~ROG~~	~~219 lb/day~~	~~PSD~~
~~SO_2~~	~~219 lb/day~~	~~PSD~~

~~Source: Prevention of Significant Deterioration.~~

~~lb/day = pounds per day.~~

It was assumed that construction of the proposed action would take approximately 3 years starting from 2009. The construction would involve activities such as site grubbing and clearing, earthwork, and cement and civil work. These activities would involve the use of diesel- and gasoline-powered equipment or vehicles that would generate emissions of criteria pollutants such as CO, NO_X, VOC, SO_X, PM_{10}, and $PM_{2.5}$. In addition, the site preparation and earthwork would result in fugitive PM_{10} and $PM_{2.5}$ emissions. The assumption was made that construction activities at each location would occur in three phases over the 3-year construction period. Phase I would involve clearing and grubbing; and Phase II would involve earthwork, excavation, sorting, and transporting excavated and fill material. Phase III would include concrete work and civil construction.

The Mill Site assumptions included three sub-phases for Phase II. Phase II-A included the excavation and transport of material from the proposed forebay (up to 580,000 CY). Phase II-B included onsite transport and temporary storage of approximately 170,000 CY of potential landfill material, and Phase II-C included transportation of the 170,000 CY of material to an offsite facility.

Exhaust emissions of VOC, CO, NO_X, SO_2, and PM_{10} from diesel-powered construction equipment were calculated by using emission factors derived from the California Air Resources Board OFFROAD2007 Emissions Model (California Air Resources Board, 2007). Default horsepower rating of each type of equipment was obtained from URBEMIS2007. $PM_{2.5}$ emission factors were not readily available from the OFFROAD model; they were estimated following the methodology recommended by South Coast Air Quality Management District (SCAQMD) and used its published fraction of $PM_{2.5}$ to PM_{10} for diesel combustion exhaust (SCAQMD, 2006a).

Exhaust emissions of VOC, CO, NO_X, SO_2, $PM_{2.5}$, and PM_{10} from on-road vehicles, including the heavy-duty diesel trucks and workers' commute, were calculated using emission factors generated by the EMFAC2007 model with the vehicle fleet representative of the Tehama County

(California Air Resources Board, 2007). The emissions from vehicles included both the onsite and offsite emissions and for vehicle traveling and idling.

Fugitive dust emissions from construction were calculated by using the total area of disturbance. Uncontrolled fugitive PM_{10} emissions were estimated using the default URBEMIS2007 emission factor of 10 pounds per acre of disturbed area. To be conservative, it was assumed that 3 acres of area would be disturbed on any given day. The PM_{10} was assumed to be 68 percent controlled by watering the site three times per day, according to the SCAQMD CEQA Handbook (SCAQMD, 2006b). No emission factors are available to calculate the fugitive $PM_{2.5}$ emissions. The $PM_{2.5}$ emissions were calculated following the methodology recommended by SCAQMD and using the $PM_{2.5}$ fraction of PM_{10} in fugitive dusts (SCAQMD, 2006a).

General Conformity

Clean Air Act Section 176(c), General Conformity, established certain statutory requirements for federal agencies with proposed federal activities to demonstrate conformity of the proposed activities with each state's implementation plan for attainment of NAAQS. General conformity applies only to non-attainment and maintenance areas. Because the proposed project is in an area that is in attainment with all NAAQS, a conformity analysis is not required.

Significance Criteria

Significance criteria represent the thresholds that were used to identify whether an impact would be potentially significant. These criteria are based on Appendix G of the *CEQA Guidelines* and professional judgment.

Impacts on air quality would be significant if they would result in any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

The main area of concern for construction impacts is fugitive dust emissions.

The main area of concern for construction impacts is fugitive dust emissions. If project impacts are found to be significant, then mitigation should be applied~~. If standard mitigation measures are applied, then the impacts are considered to be insignificant for the construction impacts~~. Because the area is non-attainment with the state ambient air quality standards for PM_{10}, standard fugitive dust mitigation measures would need to be applied (see Section 3.7.3, Mitigation). When standard fugitive dust mitigation measures are applied, PM_{10} construction impacts would be insignificant.

Vehicle emissions of NO_x and ROG during construction are also of concern because the area is non-attainment with the state ambient air quality standards for ozone (see Section 3.7.3, Mitigation).

Tehama County Air Pollution Control District does not have any established emission thresholds for determining significance of construction projects. The worst-case daily emissions for each construction activity are provided below as additional information.

No Action Alternative

No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

1A: 4-month Improved Ladder Alternative

Construction-related Impacts.

Impact 1A–AQ1: Fugitive Dust Emissions. During ground surface preparation for this alternative, most of the PM_{10} emissions would be composed of fugitive dust. Emission sources would include vehicles and construction equipment traveling over dirt surfaces, site clearing, grading, cut and fill operations, and wind-blown dust.

Short-term impacts with regard to dust generated during construction would be considered potentially significant because of the current exceedance of the state PM_{10} standards; however, when standard fugitive dust mitigation measures are applied, PM_{10} construction impacts would be insignificant.

Impact 1A–AQ2: Construction Equipment and Vehicle Exhaust Emissions. Table 3.13-6~~7~~ shows the ~~vehicle~~ emissions that would be expected during project construction. ~~CO and NO_x would exceed the significance threshold.~~ No significant or unusual odors are anticipated to be generated during construction.

~~TABLE 3.13-7~~
~~Impact 1A–AQ2: Construction Equipment and Vehicles Exhaust Emissions and Fugitive Dust~~

~~Location~~	~~PM_{10}~~	~~CO~~	~~ROG~~	~~NO_x~~	~~So_x~~
~~Mill Site~~	~~6.94~~	~~435.54~~	~~29.04~~	~~133.82~~	~~14.52~~
~~Left Bank Fish Ladder~~	~~1.03~~	~~64.62~~	~~4.31~~	~~19.85~~	~~2.15~~
~~Right Bank Fish Ladder~~	~~0.37~~	~~23.00~~	~~1.53~~	~~7.07~~	~~0.77~~
~~Conveyance Facility~~	~~4.03~~	~~253.30~~	~~16.89~~	~~77.83~~	~~8.44~~
~~Disturbed Land~~	~~51.33~~				
~~Worker Vehicle Trips~~	~~0.10~~	~~1.36~~	~~0.16~~	~~0.27~~	~~0.10~~
~~Entrained Road Dust~~	~~0.61~~				
~~**Total (lb/day)**~~	~~**64.41**~~	~~**777.82**~~	~~**57.93**~~	~~**238.84**~~	~~**25.98**~~
~~***Significance Threshold (lb/day)***~~	~~***82***~~	~~***550***~~	~~***219***~~	~~***219***~~	~~***219***~~

TABLE 3.13-6
Impact 1A-AQ2: Construction Equipment and Vehicles Exhaust Emissions and Fugitive Dust

		VOC (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Mill Site	Phase I	9.8	42.0	86.2	0.1	11.2	4.9
	Phase II-A	14.0	54.1	99.7	0.1	12.2	5.8
	Phase II-B	17.5	73.5	146.3	0.1	13.9	7.4
	Phase II-C	15.8	73.8	160.6	0.1	14.2	7.6
	Phase III	32.1	128.6	355.0	0.4	21.1	13.9
Right Bank Fish Ladder	Phase I	5.3	21.7	42.9	0.0	9.5	3.3
	Phase II	11.9	48.2	134.9	0.1	12.6	6.1
Conveyance Facility	Phase I	15.2	66.7	134.2	0.1	13.3	6.8
	Phase II	21.0	90.8	230.6	0.2	16.5	9.6
Left Bank Fish Ladder	Phase I	15.2	67.5	134.2	0.1	13.3	6.9
	Phase II	5.3	21.7	42.9	0.0	9.5	3.3
	Phase III	11.8	46.0	133.9	0.1	12.6	6.1
Maximum Daily Emissions for Alternative 1A		32.1	128.6	355.0	0.4	21.1	13.9

Notes:

It is assumed that the construction phases would not overlap with each other. Therefore, the maximum daily emissions represent the worst-case daily emissions from one of the phases.

Fugitive PM_{10} and $PM_{2.5}$ emissions took into account 68 percent control efficiency by watering the site three times a day (according to the control efficiencies in SCAQMD Air Quality Handbook Table 11-4).

The impact on air quality under Alternative 1A would be temporary but significant for ~~CO and~~PM_{10}, NO_x, and ~~NO_x~~ VOC because of the County's current exceedance of the state PM_{10} and ozone standards. However, ~~Construction impacts would be temporary, and~~ when mitigation is applied, the impacts would be less than significant.

Operations-related Impacts. *Impacts from operations under Alternative 1A would not be significant since (1) the project would not increase traffic flow to the area, ~~and~~ (2) the pumps would only be operated ~~turned on~~ at limited times, and (3) the pumps would be electrically powered with no associated direct emissions; therefore, no mitigation is required.*

1B: 4-month Bypass Alternative

Construction-related Impacts.

Impact 1B–AQ1: Fugitive Dust Emissions. Impacts from construction under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A–AQ1).

Short-term impacts with regard to dust generated during construction would be considered potentially significant because of the current exceedances of the state PM_{10} standards; however, when standard fugitive dust mitigation measures are applied, PM_{10} construction impacts would be insignificant.

Impact 1B–AQ2: Construction Equipment and Vehicle Exhaust Emissions. Table 3.13-~~7~~8 shows the ~~vehicle~~ emissions that would be expected during project construction. ~~CO and NO_x would exceed the significance threshold.~~ No significant or unusual odors would be anticipated to be generated during construction.

~~TABLE 3.13-8~~
~~Impact 1B–AQ2: Construction Equipment and Vehicles Exhaust Emission and Fugitive Dust~~

~~Location~~	~~PM_{10}~~	~~CO~~	~~ROG~~	~~NO_x~~	~~SO_x~~
~~Mill Site~~	~~6.94~~	~~435.54~~	~~29.04~~	~~133.82~~	~~14.52~~
~~Bypass Channel~~	~~6.92~~	~~434.37~~	~~28.96~~	~~133.46~~	~~14.48~~
~~Right Bank Fish Ladder~~	~~0.37~~	~~23.00~~	~~1.53~~	~~7.07~~	~~0.77~~
~~Conveyance Facility~~	~~4.03~~	~~253.30~~	~~16.89~~	~~77.83~~	~~8.44~~
~~Disturbed Land~~	~~51.33~~				
~~Worker Vehicle Trips~~	~~0.10~~	~~1.36~~	~~0.16~~	~~0.27~~	~~0.10~~
~~Entrained Road Dust~~	~~0.61~~				
~~**Total (lb/day)**~~	~~**70.30**~~	~~**1,147.57**~~	~~**76.58**~~	~~**352.45**~~	~~**38.31**~~
~~***Significance Threshold (lb/day)***~~	~~***82***~~	~~***550***~~	~~***219***~~	~~***219***~~	~~***219***~~

TABLE 3.13-7
Impact 1B–AQ2: Construction Equipment and Vehicles Exhaust Emission and Fugitive Dust

		VOC (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Mill Site	Phase I	9.8	42.0	86.2	0.1	11.2	4.9
	Phase II-A	14.0	54.1	99.7	0.1	12.2	5.8
	Phase II-B	17.5	73.5	146.3	0.1	13.9	7.4
	Phase II-C	15.8	73.8	160.6	0.1	14.2	7.6
	Phase III	32.1	128.6	355.0	0.4	21.1	13.9
Bypass Channel	Phase I	15.2	67.5	134.2	0.1	13.3	6.9
	Phase II	17.5	74.3	146.4	0.1	13.9	7.4
	Phase III	16.5	64.4	181.9	0.2	14.5	7.9
Right Bank Fish Ladder	Phase I	5.3	21.7	42.9	0.0	9.5	3.3
	Phase II	11.9	48.2	134.9	0.1	12.6	6.1
Conveyance Facility	Phase I	15.2	66.7	134.2	0.1	13.3	6.8
	Phase II	21.0	90.8	230.6	0.2	16.5	9.6
Maximum Daily Emissions for Alternative 1B		32.1	128.6	355.0	0.4	21.1	13.9

Notes:

It is assumed that the construction phases would not overlap with each other. Therefore, the maximum daily emissions represent the worst-case daily emissions from one of the phases.

Fugitive PM_{10} and $PM_{2.5}$ emissions took into account 68 percent control efficiency by watering the site three times a day (according to the control efficiencies in SCAQMD Air Quality Handbook Table 11-4).

The impact on air quality under Alternative 1B would be temporary but significant for ~~CO and~~ PM_{10}, NO_x, and ~~NO_x~~ VOC because of the County's current exceedance of the state PM_{10} and ozone standards. Construction impacts would be temporary, and when mitigation is applied, the impacts would be less than significant.

Operations-related Impacts. ***Impacts from operations under Alternative 1B would not be significant since (1) the project would not increase traffic flow to the area, ~~and~~ (2) the pumps would only be operated ~~turned on~~ at limited times, and (3) the pumps would be electrically powered with no associated direct emissions; therefore, no mitigation is required.***

2A: 2-month Improved Ladder Alternative

Construction-related Impacts.

Impact 2A–AQ1: Fugitive Dust Emissions. Impacts from construction under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–AQ1).

Short-term impacts with regard to dust generated during construction would be considered potentially significant because of the current exceedances of the state PM_{10} standards; however, when standard

fugitive dust mitigation measures are applied, PM_{10} construction impacts would be insignificant.

Impact 2A–AQ2: Construction Equipment and Vehicle Exhaust Emissions. Table 3.13-89 shows the ~~vehicle~~ emissions that would be expected during project construction. ~~CO and NO_x would exceed the significance threshold.~~ No significant or unusual odors would be anticipated to be generated during construction.

~~**TABLE 3.13-9**~~
~~Impact 2A- AQ2: Construction Equipment and Vehicles Exhaust Emissions and Fugitive Dust~~

~~Location~~	~~PM_{10}~~	~~CO~~	~~ROG~~	~~NO_x~~	~~SO_x~~
~~Mill Site~~	~~9.91~~	~~621.45~~	~~41.43~~	~~190.94~~	~~20.72~~
~~Left Bank Fish Ladder~~	~~1.03~~	~~64.62~~	~~4.31~~	~~19.85~~	~~2.15~~
~~Right Bank Fish Ladder~~	~~0.37~~	~~23.00~~	~~1.53~~	~~7.07~~	~~0.77~~
~~Conveyance Facility~~	~~4.03~~	~~253.30~~	~~16.89~~	~~77.83~~	~~8.44~~
~~Disturbed Land~~	~~51.33~~				
~~Worker Vehicle Trips~~	~~0.10~~	~~1.36~~	~~0.16~~	~~0.27~~	~~0.10~~
~~Entrained Road Dust~~	~~0.61~~				
~~**Total (lb/day)**~~	~~**67.38**~~	~~**963.73**~~	~~**64.32**~~	~~**295.96**~~	~~**32.18**~~
~~***Significance Threshold (lb/day)***~~	~~***82***~~	~~***550***~~	~~***219***~~	~~***219***~~	~~***219***~~

TABLE 3.13-8
Impact 2A-AQ2: Construction Equipment and Vehicles Exhaust Emissions and Fugitive Dust

		VOC (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Mill Site	Phase I	9.8	42.0	86.2	0.1	11.2	4.9
	Phase II-A	14.0	54.1	99.7	0.1	12.2	5.8
	Phase II-B	17.5	73.5	146.3	0.1	13.9	7.4
	Phase II-C	15.8	73.8	160.6	0.1	14.2	7.6
	Phase III	32.1	128.6	355.0	0.4	21.1	13.9
Right Bank Fish Ladder	Phase I	5.3	21.7	42.9	0.0	9.5	3.3
	Phase II	11.9	48.2	134.9	0.1	12.6	6.1
Conveyance Facility	Phase I	15.2	66.7	134.2	0.1	13.3	6.8
	Phase II	21.0	90.8	230.6	0.2	16.5	9.6
Left Bank Fish Ladder	Phase I	15.2	67.5	134.2	0.1	13.3	6.9
	Phase II	5.3	21.7	42.9	0.0	9.5	3.3
	Phase III	11.8	46.0	133.9	0.1	12.6	6.1
Maximum Daily Emissions for Alternative 2A		32.1	128.6	355.0	0.4	21.1	13.9

Notes:

It is assumed that the construction phases would not overlap with each other. Therefore, the maximum daily emissions represent the worst-case daily emissions from one of the phases.

Fugitive PM_{10} and $PM_{2.5}$ emissions took into account 68 percent control efficiency by watering the site three times a day (according to the control efficiencies in SCAQMD Air Quality Handbook Table 11-4).

~~*The impact on air quality under Alternative 2A would be temporary but significant for CO and NO_x. Construction impacts would be temporary, and when mitigation is applied, the impacts would be less than significant.*~~

Operations-related Impacts. *Impacts from operations under Alternative 2A would not be significant since (1) the project would not increase traffic flow to the area, ~~and~~ (2) the pumps would only be operated ~~turned on~~ at limited times, and (3) the pumps would be electrically powered with no associated direct emissions; therefore, no mitigation is required.*

2B: 2-month with Existing Ladders Alternative

Construction-related Impacts.

Impact 2B–AQ1: Fugitive Dust Emissions. Impacts from construction under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–AQ1).

Short-term impacts with regard to dust generated during construction would be considered potentially significant because of the current exceedances of the state PM_{10} standards; however, when standard fugitive dust mitigation measures are applied, PM_{10} construction impacts would be insignificant.

Impact 2B–AQ2: Construction Equipment and Vehicle Exhaust Emissions. Table 3.13-~~10~~9 shows the ~~vehicle~~ emissions that would be expected during project construction. ~~CO and NO_x would exceed the significance threshold.~~ No significant or unusual odors are anticipated to be generated during construction

~~**TABLE 3.13-10**~~
~~Impact 2B–AQ2: Construction Equipment and Vehicles Exhaust Emissions and Fugitive Dust~~

~~Location~~	~~PM_{10}~~	~~CO~~	~~ROG~~	~~NO_x~~	~~SO_x~~
~~Mill Site~~	~~9.91~~	~~621.45~~	~~41.43~~	~~190.94~~	~~20.72~~
~~Conveyance Facility~~	~~4.03~~	~~253.30~~	~~16.89~~	~~77.83~~	~~8.44~~
~~Disturbed Land~~	~~51.33~~				
~~Worker Vehicle Trips~~	~~0.10~~	~~1.36~~	~~0.16~~	~~0.27~~	~~0.10~~
~~Entrained Road Dust~~	~~0.61~~				
~~**Total (lb/day)**~~	~~**65.98**~~	~~**876.11**~~	~~**58.48**~~	~~**269.04**~~	~~**29.26**~~
~~***Significance Threshold (lb/day)***~~	~~***82***~~	~~***550***~~	~~***219***~~	~~***219***~~	~~***219***~~

TABLE 3.13-9
Impact 2B–AQ2: Construction Equipment and Vehicles Exhaust Emissions and Fugitive Dust

		VOC (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Mill Site	Phase I	9.8	42.0	86.2	0.1	11.2	4.9
	Phase II-A	14.0	54.1	99.7	0.1	12.2	5.8
	Phase II-B	17.5	73.5	146.3	0.1	13.9	7.4
	Phase II-C	15.8	73.8	160.6	0.1	14.2	7.6
	Phase III	32.1	128.6	355.0	0.4	21.1	13.9
Conveyance Facility	Phase I	15.2	66.7	134.2	0.1	13.3	6.8
	Phase II	21.0	90.8	230.6	0.2	16.5	9.6
Maximum Daily Emissions for Alternative 2B		32.1	128.6	355.0	0.4	21.1	13.9

Notes:

It is assumed that the construction phases would not overlap with each other. Therefore, the maximum daily emissions represent the worst-case daily emissions from one of the phases.

Fugitive PM_{10} and $PM_{2.5}$ emissions took into account 68 percent control efficiency by watering the site three times a day (according to the control efficiencies in SCAQMD Air Quality Handbook Table 11-4).

The impact on air quality under Alternative 2B would be temporary but significant for ~~CO and~~ PM_{10}, NO_x, and ~~NO_x~~ VOC because of the County's current exceedance of the state PM_{10} and ozone standards. Construction impacts would be temporary, and when mitigation is applied, the impacts would be less than significant.

Operations-related Impacts. ***Impacts from operations under Alternative 2B would not be significant since (1) the project would not increase traffic flow to the area, ~~and~~ (2) the pumps would only be operated ~~turned on~~ at limited times, and (3) the pumps would be electrically powered with no associated direct emissions; therefore, no mitigation is required.***

3: Gates-out Alternative

Construction-related Impacts.

Impact 3–AQ1: Fugitive Dust Emissions. Impacts from construction under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–AQ1).

Short-term impacts with regard to dust generated during construction would be considered potentially significant because of the current exceedances of the state PM_{10} standards; however, when standard fugitive dust mitigation measures are applied, PM_{10} construction impacts would be insignificant.

Impact 3–AQ2: Construction Equipment and Vehicle Exhaust Emissions. Table 3.13-10~~11~~ shows the ~~vehicle~~ emissions that would be expected during project construction. ~~CO and NO_x would exceed the significance threshold.~~ No significant or unusual odors would be anticipated to be generated during construction.

~~TABLE 3.13-11~~
~~Impact 3–AQ2: Construction Equipment and Vehicles Exhaust Emissions and Fugitive Dust~~

~~Location~~	~~PM_{10}~~	~~CO~~	~~ROG~~	~~NO_x~~	~~So_x~~
~~Mill Site~~	~~19.71~~	~~1236.43~~	~~82.43~~	~~379.89~~	~~41.21~~
~~Conveyance Facility~~	~~4.03~~	~~253.30~~	~~16.89~~	~~77.83~~	~~8.44~~
~~Disturbed Land~~	~~51.33~~				
~~Worker Vehicle Trips~~	~~0.10~~	~~1.36~~	~~0.16~~	~~0.27~~	~~0.10~~
~~Entrained Road Dust~~	~~0.61~~				
~~**Total (lb/day)**~~	~~**75.78**~~	~~**1,491.09**~~	~~**99.48**~~	~~**457.99**~~	~~**49.75**~~
~~***Significance Threshold (lb/day)***~~	~~***82***~~	~~***550***~~	~~***219***~~	~~***219***~~	~~***219***~~

TABLE 3.13-10
Impact 3–AQ2: Construction Equipment and Vehicles Exhaust Emissions and Fugitive Dust

		VOC (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Mill Site	Phase I	9.8	42.0	86.2	0.1	11.2	4.9
	Phase II-A	14.0	54.1	99.7	0.1	12.2	5.8
	Phase II-B	17.5	73.5	146.3	0.1	13.9	7.4
	Phase II-C	15.8	73.8	160.6	0.1	14.2	7.6
	Phase III	32.1	128.6	355.0	0.4	21.1	13.9
Conveyance Facility	Phase I	15.2	66.7	134.2	0.1	13.3	6.8
	Phase II	21.0	90.8	230.6	0.2	16.5	9.6
Maximum Daily Emissions for Alternative 3		32.1	128.6	355.0	0.4	21.1	13.9

Notes:

It is assumed that the construction phases would not overlap with each other. Therefore, the maximum daily emissions represent the worst-case daily emissions from one of the phases.

Fugitive PM_{10} and $PM_{2.5}$ emissions took into account 68 percent control efficiency by watering the site three times a day (according to the control efficiencies in SCAQMD Air Quality Handbook Table 11-4).

The impact on air quality under Alternative 3 would be temporary but significant for ~~CO and~~ PM_{10}, NO_x, and ~~NO_x~~ VOC because of the County's current exceedance of the state PM_{10} and ozone standards. Construction impacts would be temporary, and when mitigation is applied, the impacts would be less than significant.

Operations-related Impacts. ***Impacts from operations under Alternative 3 would not be significant since (1) the project would not increase traffic flow to the area, ~~and~~ (2) the pumps would only be operated ~~turned on~~ at limited times, and (3) the pumps would be electrically powered with no associated direct emissions; therefore, no mitigation is required.***

3.13.3 Mitigation

This section discusses mitigations for each significant impact described in Environmental Consequences.

1A: 4-month Improved Ladder Alternative

Mitigation 1A–AQ1. To mitigate for short-term air quality impacts associated with the proposed project from dust generated during periods of construction activities, a fugitive dust emissions control plan ~~dust control program~~ would be implemented in accordance with Tehama County Air Pollution Control District Rule 4:24, with the following components:

- Equipment and manual watering would be conducted on all stockpiles, dirt/gravel roads, and exposed or disturbed soil surfaces, as necessary, to reduce airborne dust.
- The contractor or builder would designate a person to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. This person would respond to citizen complaints.
- Dust-producing activities would be suspended when high winds create construction-induced visible dust plumes moving beyond the site in spite of dust control.
- All trucks hauling soil and other loose material would be covered, or would be required to have at least 2 feet of freeboard.
- All unpaved access roads and staging areas at construction sites would have soil stabilizers applied as necessary.
- Streets in and adjacent to construction area would be kept swept and free of visible soil and debris.
- Traffic speeds on all unpaved roads would be limited to 15 miles per hour.

Mitigation 1A–AQ2. To mitigate for short-term air quality impacts associated with the proposed project from construction equipment emission, an equipment control program would be implemented with the following components:

- Properly maintain equipment.
- Limit idling time when the equipment is not in operation.

1B: 4-month Bypass Alternative

Mitigation 1B–AQ1. See Mitigation 1A–AQ1.

Mitigation 1B–AQ2. See Mitigation 1A–AQ2.

2A: 2-month Improved Ladder Alternative

Mitigation 2A–AQ1. See Mitigation 1A–AQ1.

Mitigation 2A–AQ2. See Mitigation 1A–AQ2.

2B: 2-month with Existing Ladders Alternative

Mitigation 2B–AQ1. See Mitigation 1A–AQ1.

Mitigation 2B–AQ2. See Mitigation 1A–AQ2.

3: Gates-out Alternative

Mitigation 3–AQ1. See Mitigation 1A–AQ1.

Mitigation 3–AQ2. See Mitigation 1A–AQ2.

3.14 Traffic and Circulation

3.14.1 Affected Environment

Regional access to the project area is provided by I-5 and California State Highway 99.

Regional Access

Regional access to the project area is provided by I-5 and California State Highway 99. I-5 is the principle north-south arterial along the west side of the Central Valley. Highway 99 is also a main north-south arterial for California, extending from Red Bluff south along the east side of the Central Valley. Figure 3.14-1 illustrates transportation access near the project site.

Union Pacific Railroad

Union Pacific Railroad tracks traverse the City of Red Bluff along State Highway 36, intersect South Main Street, and continue along Old Highway 99. Train traffic generally passes through the area between the hours of 4 p.m. and 8 a.m. and is mainly general freight. The nearest passenger stops are at Redding and Chico. An average of 12 trains pass through the area on a daily basis, with an estimated average traffic delay of approximately 2 minutes (City of Red Bluff, 1991).

The diversion dam is accessed via County Road 99 West and Altube Avenue.

Roadways

The diversion dam is accessed via County Road 99 West and Altube Avenue. Road 99 West, accessible from the northbound and southbound lanes of I-5, is classified by Tehama County as an arterial and collector road (see Figure 3.14-1). Table 3.14-1 shows the peak-hour (PH) average traffic counts from the City of Red Bluff Department of Public Works for Road 99 West south of I-5 (this traffic count does not include truck traffic from Wal-Mart).

TABLE 3.14-1
Road 99 West Peak-hour Average Traffic Counts[a]

Hour	Northbound	Southbound
6:00 A.M.	443.25	--
11:00 A.M.	--	365.75
3:00 P.M.	735.5	681.5

[a]Traffic counts from 1997.

Altube Avenue, classified by Tehama County as a minor local street, primarily serves USBR traffic and occasional traffic for adjacent orchards.

The Mill Site is accessible via Diamond Avenue.

The Mill Site is accessible via Diamond Avenue. Diamond Avenue is classified by the City of Red Bluff as a two-lane collector road and is directly accessed from southbound I-5. To access the avenue from the northbound lane, it is necessary to exit I-5 to South Main Street and

follow South Main Street north to Diamond Avenue. A driveway that once served the Diamond Mill site still exists on Diamond Avenue. The majority of traffic that uses this road is heavy trucks and commuters. Traffic counts are not available.

Access to recreation facilities on the left bank is provided by Sale Lane. Sale Lane is classified by the City of Red Bluff as a two-lane major rural and urban collector road, and is accessed by northbound and southbound lanes of I-5 to Antelope Boulevard/Highway 36 East. Antelope Boulevard/Highway 36 East is classified by the City of Red Bluff as a major arterial/rural highway, and is located in central Red Bluff. Sale Lane exists in both the City of Red Bluff and Tehama County; therefore, both entities have jurisdiction of the road. Table 3.14-2 shows the PH traffic counts from the Tehama County Department of Public Works for Sale Lane.

Access to recreation facilities on the left bank is provided by Sale Lane.

TABLE 3.14-2
Sale Lane Peak-hour Traffic Counts[a]

Hour	Northbound	Southbound
2:00 P.M.	161	--
1:00 P.M.	--	179

[a]This traffic count data was collected in February of 2001, and may change significantly in the summer months because of an increase in recreation activity at Lake Red Bluff.

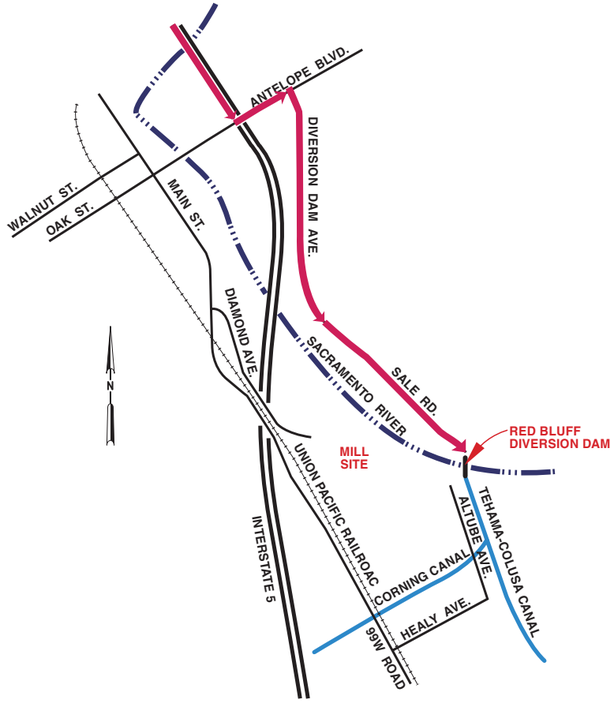
Pedestrian/Bicycle Access

Short-range bicycle and pedestrian facilities for Tehama County have not been programmed but will be developed, primarily in urbanized areas, as the need arises (Tehama County, 1997). The City has developed bicycle route designations denoting the type and quality of the route. The majority of the bikeway system comprises Class III routes. Class III routes are defined as bicycle pathways that are shared usage of streets with no specific separation of different modes of traffic. Street signage is often used to designate a roadway as a bicycle route. Routes include all major and minor arterials and collector streets of the City, including Main Street and Antelope Boulevard. A portion of the designated City bicycle route extends along Sale Lane, toward the Recreation Area.

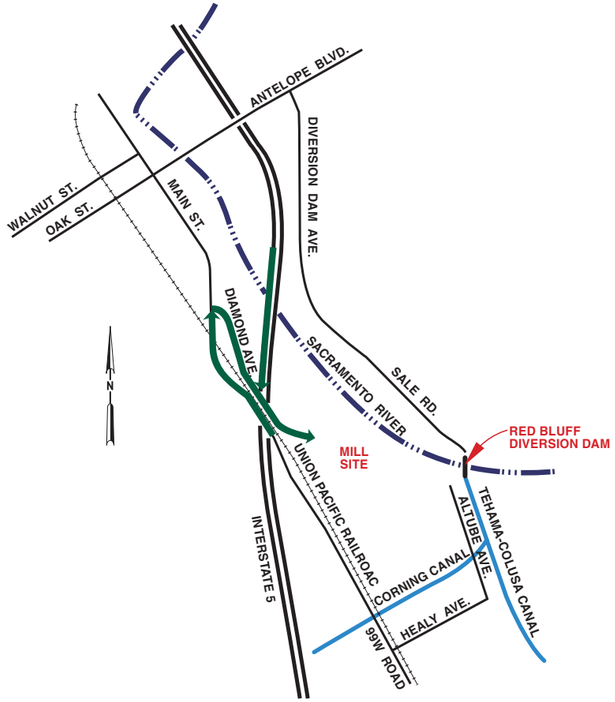
3.14.2 Environmental Consequences

Methodology

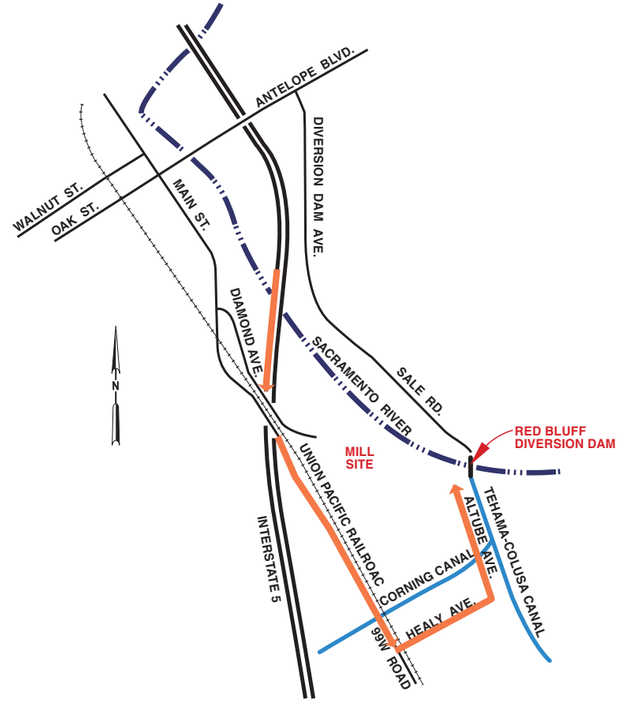
Level of Service (LOS) was established by the Institute of Transportation Engineers as a guideline for quantifying the subjective measure of traffic tolerance. Three distinct guidelines can be used to determine the LOS of a section of roadway: segmental volumes, volume to capacity (V/C) ratios, or delays at intersections. Once LOS is determined, a letter designation ranging from A to F is applied to the section of roadway



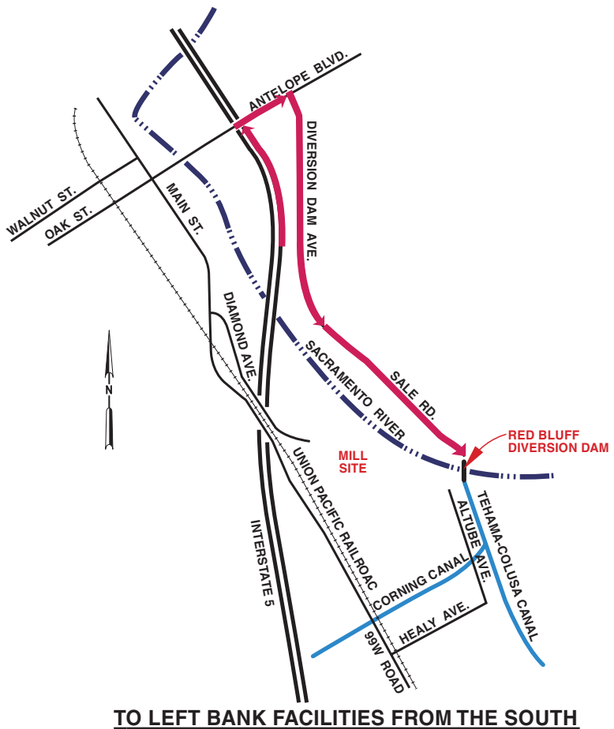
TO LEFT BANK FACILITIES FROM THE NORTH



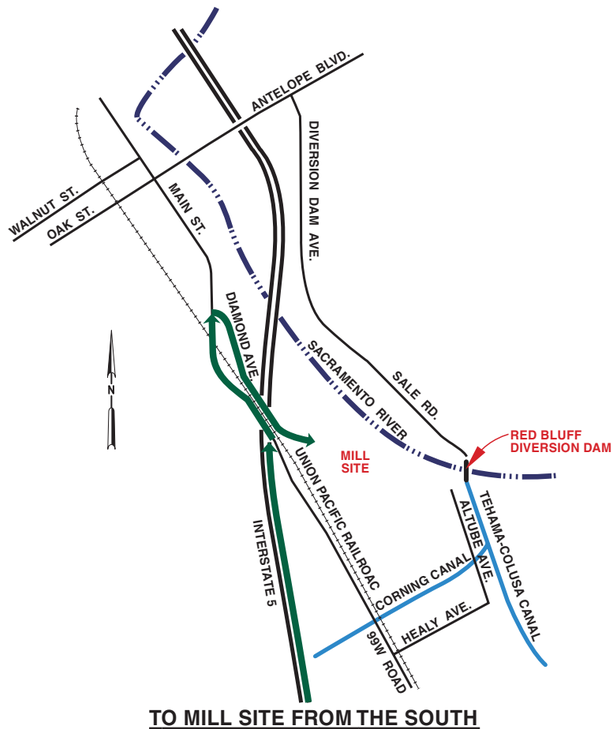
TO MILL SITE FROM THE NORTH



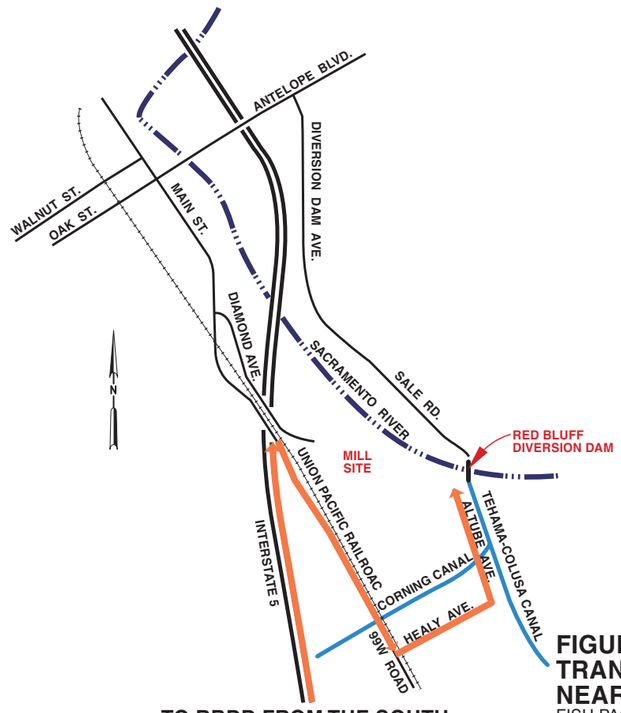
TO RBDD FROM THE NORTH



TO LEFT BANK FACILITIES FROM THE SOUTH



TO MILL SITE FROM THE SOUTH



TO RBDD FROM THE SOUTH

FIGURE 3.14-1
TRANSPORTATION ACCESS NEAR PROJECT SITE
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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being analyzed. LOS "A" represents fully unconstrained traffic flow, and LOS "F" represents an unstable flow situation bordering on gridlock. The Federal Highway Administration (FHA) Capacity Manual Update (1985) provides the formulas used to evaluate roadway LOS. Data provided in Table 3.14-3 represent the V/C method of computing LOS.

TABLE 3.14-3
Level of Service Threshold Volume to Capacity Ratios for Urban/Suburban Roadway Types

Level of Service	Freeway Conditions	Highway/Urban Conditions
LOS A	V/C 0 to 0.35 Free flow. Individual users virtually unaffected by presence of others in traffic stream. Freedom to select desired speed and maneuver within traffic stream is extremely high. General level of comfort and convenience is excellent.	V/C 0 to 0.05 Free-flow operations at average travel speeds of about 90 percent of free-flow speed. Vehicles unimpeded in ability to maneuver. Stopped delay at signalized intersections is minimal.
LOS B	V/C 0.36 to 0.54 Stable flow. Presence of other users in traffic stream begins to be noticeable. Freedom to select speed relatively unaffected, but slight decline in freedom to maneuver within traffic stream from LOS A. Level of comfort and convenience somewhat less than LOS A.	V/C 0.06 to 0.17 Reasonably unimpeded operations at average speeds of about 70 percent of free flow. Ability to maneuver only slightly restricted, and stopped delays not bothersome.
LOS C	V/C 0.55 to 0.77 Stable flow, but begins range of flow where individuals are significantly affected by interactions with others in traffic stream. Selection of speed is affected; maneuvering requires substantial vigilance. General level of comfort and convenience declines noticeably at this level.	V/C 0.18 to 0.34 Stable operations, but ability to maneuver and change lanes more restricted than LOS B. Longer signal delays and lower speeds reduce average speed to about 50 percent of free flow. Motorists experience appreciable tension.
LOS D	V/C 0.78 to 0.93 High-density, but stable flow. Speed and freedom to maneuver severely restricted. Poor level of comfort and convenience. Small increases in flow would generally cause operational problems at this level.	V/C 0.35 to -0.58 Small increases in flow may cause substantial increases in approach delay and decreases in speed to about 40 percent of average free flow.
LOS E	V/C 0.94 to 1.00 Operating conditions at or near capacity level. Speeds reduced to low but relatively uniform value. Freedom to maneuver extremely difficult. Comfort and convenience extremely poor and frustration generally high. Operations usually unstable; small increases in flow or minor perturbations would cause breakdown.	V/C 0.59 to 1.00 Significant approach delays and average speed of about one-third free flow or lower.
LOS F	V/C 1.01+ Forced or breakdown flow. Traffic exceeds capacity. Queues form where traffic flow is characterized by stop-and-go waves.	V/C 1.01+ Extremely low speeds from one-third to one-quarter of free-flow speed. Intersection congestion likely at critical signalized locations.

Source: FHA, 1985.
Note: V/C ratios are analyzed with PH volumes.

The significance of construction-related traffic is based on the addition of construction and detour traffic to the roadway system and the impact to existing operations of these roadways.

The significance of construction-related traffic is based on the addition of construction and detour traffic to the roadway system and the impact to existing operations of these roadways. Standards have not been established by FHA for LOS of roadways during construction. However, for the purposes of this report, Appendix G of the *CEQA Guidelines* is used to define the standard of significance for temporary traffic impacts in the project area.

Tehama County and the City of Red Bluff do not have an established LOS. The City of Red Bluff has PH intersection and roadway volume and LOS measurements for several key roadways and intersections. Both the City and County Public Works departments determine the significance level of a project on a case-by-case basis. Typically, a project's level of impact is determined by the type, location, and duration of construction.

City of Red Bluff

The objective of the City of Red Bluff Circulation Element of the General Plan is to efficiently transport people and goods throughout Red Bluff. Several objectives and respective policies have been established in the Circulation Element that implement the goal of creating problem-free circulation throughout the City of Red Bluff. The Circulation Element addresses factors such as noise, land use, housing, and safety as integral parts of its overall circulation plan.

The City of Red Bluff defines their roadways using the 1985 Highway Capacity Manual. Table 3.14-4 provides the definitions used to classify roadways within the City's jurisdiction.

Tehama County

The Tehama County General Plan Circulation Element covers all territory within the County boundaries. It also takes into account any area outside of its jurisdiction which, "bears relation to its planning (Government Code Section 65300)." The overall goals of the Circulation Element are to work toward a circulation and transportation system that will maintain and improve the social, natural, and economic quality of life in Tehama County (Tehama County, 1997).

Tehama County has assigned functional classifications to its roads. These classifications group roads and highways by the character of service they provide, and help guide the improvement of the existing and future circulation network. Table 3.14-5 provides the definition of the seven classifications assigned to Tehama County's roads.

TABLE 3.14-4
City of Red Bluff Circulation Element, Roadway Classifications

Roadway Designation	Definition
Freeway	Characterized by high speed and limited and controlled access, freeways primarily serve regional and long-distance travel.
Rural Highway	Rural highways are generally higher-speed, medium-capacity, two-lane roadways with one lane for travel in each direction. Passing of slower vehicles requires the use of the opposing lane where traffic gaps allow. Undivided multi-lane highways without full control of access as found in freeways may also be classified as rural highways.
Arterial	Major: These streets are generally higher-speed, higher-capacity transportation corridors that link the community with highways and freeways. Minor: Medium-speed and medium-capacity transportation corridors, these roads are principally for travel between larger land uses within the community.
Collector	Relatively low-speed and low-capacity transportation corridors, collector streets are generally two lanes connecting neighborhoods with other neighborhoods as well as with the arterial system.
Local Street	Local streets are low-speed, low-capacity streets that provide direct access to adjacent land uses and are typically meant only for local, as opposed to through, traffic.

Source: City of Red Bluff, 1991.

TABLE 3.14-5
Tehama County Circulation Element, Functional Classifications

Roadway Designation	Definition
Highway	Provides regional, statewide, and national transportation connections and includes I-5 and all other state highways. Access from highways to adjacent properties shall be limited for safety and traffic efficiency. Right-of-way widths are to be determined by the California Department of Transportation (Caltrans).
Arterial	Provides connections between links in the highway network and connects major destinations within the highway network. Major community facilities such as community-serving retail centers, industrial parks, office and business parks, and educational facilities should be located in proximity to arterial. Access from arterial to adjoining properties should be limited for safety and traffic efficiency. Curbside parking should be prohibited where feasible. Average daily traffic (ADT) on arterial can range from 3,000 ADT in rural areas to 36,000 ADT in urban areas. For the purpose of Section 66484 of the Subdivision Map Act, an arterial shall be considered a major thoroughfare.
Collector	Accommodates traffic between arterial streets and/or activity centers. Within residential areas, traffic is funneled onto collectors and then to connecting arterials. Small-scale retail, industrial, or commercial establishments may have direct access to collectors, but direct access to individual residential lots should be limited where feasible to improve traffic safety and efficiency. Curbside parking should be prohibited where feasible. Average daily traffic can range from 600 ADT in rural areas to 20,000 ADT in urban areas. For the purpose of Section 66484 of the Subdivision Map Act, a collector shall be considered a major thoroughfare.

TABLE 3.14-5
Tehama County Circulation Element, Functional Classifications

Roadway Designation	Definition
Subcollector	Provides connection between local streets and collector or arterial streets. Subcollectors generally serve 300 or more housing units with average daily traffic ranging from 400 to 1,000 ADT. Direct access from adjoining parcels is permitted. Curbside parking is permitted, but should be discouraged for safety and aesthetic reasons, where densities are concentrated such as in clustered or planned unit developments.
Major Local Street	Provides access from 500 to 300 housing units to a subcollector, collector, or arterial. Minor local streets may funnel into a major local street. Major local streets provide direct access to individual adjoining properties.
Local Street	Provides access for 25 to 49 potential residences. Local streets provide direct access to individual adjoining properties.
Minor Local Street	Provides access for 5 to 24 potential residences. The number of units served depends on the road length and type of housing unit. Minor local streets are the only streets that may dead end in a cul-de-sac or court; however, if such is the case, the number of potential residences to be served shall not exceed 25 without some form of emergency access. The maximum length of street should not exceed 1,000 feet with only a single means of egress.

Source: Tehama County, 1997.

Significance Criteria

Significance criteria represent the thresholds that were used to identify whether an impact would be potentially significant. These criteria are based on Appendix G of the *CEQA Guidelines* and professional judgment.

Impacts on traffic would be significant if they would result in any of the following:

- An increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- Exceed, either individually or cumulatively, a LOS standard established by the County congestion/management agency for designated roads or highways.

No Action Alternative

No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

1A: 4-month Improved Ladder Alternative

Construction-related Impacts.

Impact 1A–TC1: Left Bank Construction. Traffic generated during construction of the proposed project would temporarily increase traffic to Sale Lane and Antelope Boulevard/Highway 36 East. Table 3.14-6 lists the LOS and PH intersection and roadway volumes of the local roads and corresponding intersections that are expected to be traveled during construction.

TABLE 3.14-6
LOS for Existing Roadways and Intersections[a]

Traffic Type	Location	Existing LOS	PH Volume[b]
Roadway	Antelope Boulevard between Highway 36 East/Sale Lane	B	620
Intersect	Antelope Boulevard between Sale Lane/Belle Mill Road	D	1,804
	Antelope Boulevard/ Highway- 36 East	A	724
	Antelope Boulevard at Belle Mill Road	E	2,444

[a]City of Red Bluff, 1991.
[b]Traffic volumes measured in June 1990 through February 1991.

Many of the vehicles associated with construction would be heavy-duty trucks, including 20-yard earth-moving trucks, 10-yard concrete trucks, and commuter traffic. Table 3.14-7 shows the approximate daily number of vehicles needed for construction of the left bank fish ladder.

Traffic impacts from construction of the proposed left bank fish ladder are anticipated to be minimal on Antelope Boulevard between Sale Lane and Belle Mill Road. However, large construction vehicles could exceed the capacity of Sale Lane. Sale Lane is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.

Because the traffic increase to Antelope Boulevard/Highway 36 East would be temporary, impacts to traffic from construction of the left bank fish ladder would be less than significant; therefore, no mitigation is required.

The impact from construction-related vehicles on Sale Lane could directly damage roadways. This would be a significant impact.

TABLE 3.14-7
Anticipated Vehicles Needed for Construction of Left Bank Fish Ladder

Construction Activity	Description/Location	Vehicle Type	Vehicles per Day
Earthwork	Cut and fill work on the left bank fish ladder would be require the removal of approximately 16,000 CY of material. Approximately 5,000 CY would be disposed of onsite. The remainder of the excavated material would be hauled to an offsite disposal area.	20-yard trucks	40-50
		Personal vehicles (for construction crew)	25
Concrete Trucks	Concrete lining of fish ladder would require a steady supply of concrete material. It is unknown whether a construction contractor would use a portable batch plant to supply materials onsite.	8- to 10-yard trucks	25
		Personal vehicles (for construction crew)	25
Miscellaneous	If a portable batch plan is used, it would require material to make concrete on-site. Additional miscellaneous traffic includes pile-driving equipment, construction inspectors, painters, carpenters, iron workers, repair trucks.	20-yard trucks	15
		Varying types	25
Total			**165**

Impact 1A–TC2: Right Bank Construction. The remainder of construction traffic would be to the proposed Mill Site fish screen and conveyance facilities and right bank fish ladder. Access to the Mill Site would be via Diamond Avenue off Main Street and I-5. Currently, Diamond Avenue predominantly consists of heavy truck and commuter traffic. Existing LOS have not been measured for the Diamond Avenue/Main Street intersection. Construction of the fish screen would require a large amount of earth movement and transport, as well as commuter traffic.

Table 3.14-8 shows the approximate number of daily vehicles needed for construction of the Mill Site fish screen and conveyance facilities.

Access to the right bank fish ladder would be via County Road 99 West to Altube Avenue. Traffic impacts from construction of the proposed right bank fish ladder are anticipated to be minimal on Altube Avenue. However, large construction vehicles could exceed the capacity of the road. Altube Avenue is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface. Table 3.14-9 shows the approximate number of daily vehicles needed for construction of the right bank fish ladder.

TABLE 3.14-8
Anticipated Vehicles Needed for Construction of Mill Site Fish Screen and Conveyance Facilities

Construction Activity	Description/Location	Vehicle Type	Vehicles per Day
Earthwork and Material Import	Cut and fill work on Mill Site fish screen and conveyance facilities would require the removal of approximately 750,000 CY of material. Approximately 580,000 CY would be disposed of onsite. The remainder of the excavated material would be hauled to an offsite disposal area. Large volumes of fill material would be brought onsite.	20-yard trucks	52
		Personal vehicles (for construction crew)	30
Concrete Trucks	Concrete lining of fish ladder would require a steady supply of concrete material. It is unknown whether a construction contractor would use a portable batch plant to supply materials onsite.	8- to 10-yard trucks	25
		Personal vehicles (for construction crew)	30
Miscellaneous	If a portable batch plan is used, it would require material to make concrete onsite. Additional miscellaneous traffic includes pile-driving equipment, construction inspectors, painters, iron workers, carpenters, repair trucks.	20-yard trucks	15
		Varying types	25
Total			**177**

TABLE 3.14-9
Anticipated Vehicles Needed for Construction of Right Bank Fish Ladder

Construction Activity	Description/Location	Vehicle Type	Vehicles per Day
Earthwork	Cut and fill work on the left bank fish ladder would require the removal of approximately 4,000 CY of material. Approximately 1,400 CY would be disposed of onsite. The remainder of the excavated material would be hauled to an offsite disposal area.	20-yard trucks	20-30
		Personal vehicles (for construction crew)	15
Concrete Trucks	Concrete lining of fish ladder would require a steady supply of concrete material. It is unknown whether a construction contractor would use a portable batch plant to supply materials onsite.	8- to 10-yard trucks	25
		Personal vehicles (for construction crew)	25
Miscellaneous	If a portable batch plan is used, it would require material to make concrete on-site. Additional miscellaneous traffic includes pile-driving equipment, construction inspectors, painters, iron workers, carpenters, repair trucks.	20-yard trucks	15
		Varying types	25
Total			**135**

Because Diamond Avenue is currently designed to accommodate heavy commuter traffic, and construction traffic impacts would be temporary, traffic impacts to Diamond Avenue would be less than significant; therefore, no mitigation is required.

The impact from construction-related vehicles on Altube Avenue could directly damage roadways. This would be a significant impact.

Operations-related Impacts. ***No operations-related impacts are anticipated under Alternative 1A; therefore, no mitigation is required.***

1B: 4-month Bypass Alternative

Construction-related Impacts.

Impact 1B–TC1: Bypass Construction. Traffic generated during construction of the proposed project would temporarily increase traffic to Sale Lane and Antelope Boulevard/Highway 36 East. Table 3.14-6 lists the LOS and PH intersection and roadway volumes of the local roads and corresponding intersections that are expected to be traveled during construction.

Many of the vehicles associated with construction would be heavy-duty trucks, including 20-yard earth moving trucks, 10-yard concrete trucks, and commuter traffic. Table 3.14-10 shows the approximate number of daily vehicles needed for construction of the bypass channel.

TABLE 3.14-10
Anticipated Vehicles Needed for Construction of Bypass Channel

Construction Activity	Description/Location	Vehicle Type	Vehicles per Day
Earthwork and Material Import	Cut and fill work on the bypass channel would require the removal of approximately 230,000 CY of material. The majority of the excavated material would be hauled to an offsite disposal area.	20-yard trucks	52
		Personal vehicles (for construction crew)	25
	Large volumes of riprap and gravel fill material would be brought onsite.		
Concrete Trucks	Concrete lining of bypass channel would require a steady supply of concrete material. It is unknown whether a construction contractor would use a portable batch plant to supply materials onsite.	8- to 10-yard trucks	25
		Personal vehicles (for construction crew)	25
Miscellaneous	If a portable batch plan is used, it would require material to make concrete onsite. Additional miscellaneous traffic includes pile-driving equipment, construction inspectors, painters, iron workers, carpenters, repair trucks.	20-yard trucks	15
		Varying types	25
Total			**177**

Construction-related traffic impacts from construction of the proposed bypass channel are anticipated to be significant on Antelope Boulevard between Sale Lane and Belle Mill Road, although the roadway currently has a measured LOS of D in the affected area. In addition, large construction vehicles could exceed the capacity of Sale Lane. Sale Lane is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.

Impacts to traffic caused by construction of the bypass channel would be significant and unavoidable.

The impact of construction-related vehicles on Sale Lane could directly damage roadways. This would be a significant impact.

Impact 1B–TC2: Right Bank Construction. The remainder of construction traffic would be to the proposed Mill Site fish screen and conveyance facilities and right bank fish ladder. Access to the Mill Site would be via Diamond Avenue off Main Street and I-5. Currently, Diamond Avenue predominantly consists of heavy truck and commuter traffic. Existing LOS have not been measured for the Diamond Avenue/Main Street intersection. Construction of the fish screen would require a large amount of earth movement and transport, as well as commuter traffic. Table 3.14-8 shows the approximate number of daily vehicles needed for construction of the Mill Site fish screen and conveyance facilities.

Access to the right bank fish ladder would be via County Road 99 West to Altube Avenue. Traffic impacts from construction of the proposed right bank fish ladder are anticipated to be minimal on Altube Avenue. However, large construction vehicles could exceed the capacity of the road. Altube Avenue is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface. Table 3.14-9 shows the approximate number of daily vehicles needed for construction of the right bank fish ladder.

Because Diamond Avenue is currently designed to accommodate heavy commuter traffic, and construction traffic impacts would be temporary, traffic impacts to Diamond Avenue would be less than significant; therefore, no mitigation is required.

The impact of construction-related vehicles on Altube Avenue could directly damage roadways. This would be a significant impact.

Operations-related Impacts. ***No operations-related impacts are anticipated under Alternative 1B; therefore, no mitigation is required.***

2A: 2-month Improved Ladder Alternative

Construction-related Impacts.

Impact 2A–TC1: Left Bank Construction. Traffic generated during construction of the proposed project would temporarily increase traffic to Sale Lane and Antelope Boulevard/Highway 36 East. Table 3.14-6 lists the LOS and PH intersection and roadway volumes of the local roads and corresponding intersections that are expected to be traveled during construction.

Many of the vehicles associated with construction would be heavy-duty trucks, including 20-yard earth moving trucks, 10-yard concrete trucks, and commuter traffic. Table 3.14-7 shows the approximate number of daily vehicles needed for construction of the left bank fish ladder.

Traffic impacts from construction of the proposed left bank fish ladder are anticipated to be minimal on Antelope Boulevard between Sale Lane and Belle Mill Road. However, large construction vehicles could exceed the capacity of Sale Lane. Sale Lane is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.

Because the traffic increase to Antelope Boulevard/Highway 36 East would be temporary, impacts to traffic from construction of the left bank fish ladder would be less than significant; therefore, no mitigation is required.

The impact of construction-related vehicles on Sale Lane could directly damage roadways. This would be a significant impact.

Impact 2A–TC2: Right Bank Construction. The remainder of construction traffic would be to the proposed Mill Site fish screen and conveyance facilities and right bank fish ladder. Access to the Mill Site would be via Diamond Avenue off Main Street and I-5. Currently, Diamond Avenue predominantly consists of heavy truck and commuter traffic. Existing LOS have not been measured for the Diamond Avenue/Main Street intersection. Construction of the fish screen would require a large amount of earth movement and transport, as well as commuter traffic. Table 3.14-8 shows the approximate number of daily vehicles needed for construction of the Mill Site fish screen and conveyance facilities.

Access to the right bank fish ladder would be via County Road 99 West to Altube Avenue. Traffic impacts from construction of the proposed right bank fish ladder are anticipated to be minimal on Altube Avenue. However, large construction vehicles could exceed the capacity of the road. Altube Avenue is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface. Table 3.14-9 shows the approximate number of daily vehicles needed for construction of the right bank fish ladder.

Because Diamond Avenue is currently designed to accommodate heavy commuter traffic, and construction traffic impacts would be temporary, traffic impacts to Diamond Avenue would be less than significant; therefore, no mitigation is required.

The impact of construction-related vehicles on Altube Avenue could directly damage roadways. This would be a significant impact.

Operations-related Impacts. ***No operations-related impacts are anticipated under Alternative 2A; therefore, no mitigation is required.***

2B: 2-month with Existing Ladders Alternative

Construction-related Impacts.

Impact 2B–TC1: Right Bank Construction. The majority of traffic generated during construction of the proposed project would be to the proposed Mill Site fish screen and conveyance facilities. Access to the Mill Site would be via Diamond Avenue off Main Street and I-5. Currently, Diamond Avenue predominantly consists of heavy truck and commuter traffic. Existing LOS have not been measured for the Diamond Avenue/Main Street intersection. Construction of the fish screen would require a large amount of earth movement and transport, as well as commuter traffic. Traffic impacts from construction are anticipated to be minimal on Altube Avenue. However, large construction vehicles could exceed the capacity of the road. Altube Avenue is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.

Construction of the fish screen would require a large amount of earth movement and transport. Many of the vehicles associated with construction would be heavy-duty trucks, including 20-yard earth moving trucks, 10-yard concrete trucks, and commuter traffic. Table 3.14-8 shows the approximate number of daily vehicles needed for construction of the Mill Site fish screen and conveyance facilities.

Because Diamond Avenue is currently designed to accommodate heavy commuter traffic, and construction traffic impacts would be temporary, traffic impacts to Diamond Avenue would be less than significant; therefore, no mitigation is required.

The impact of construction-related vehicles on Altube Avenue could directly damage roadways. This would be a significant impact.

Operations-related Impacts. ***No operations-related impacts are anticipated under Alternative 2B; therefore, no mitigation is required.***

3: Gates-out Alternative

Construction-related Impacts

Impact 3–TC1: Fish Screen. The majority of traffic generated during construction of the proposed project would be to the proposed Mill Site

fish screen and conveyance facilities. Access to the Mill Site would be via Diamond Avenue off Main Street and I-5. Currently, Diamond Avenue predominantly consists of heavy truck and commuter traffic. Existing LOS have not been measured for the Diamond Avenue/Main Street intersection. Construction of the fish screen would require a large amount of earth movement and transport, as well as commuter traffic. Traffic impacts from construction are anticipated to be minimal on Altube Avenue. However, large construction vehicles could exceed the capacity of the road. Altube Avenue is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.

Construction of the fish screen would require a large amount of earth movement and transport. Many of the vehicles associated with construction would be heavy-duty trucks, including 20-yard earth moving trucks, 10-yard concrete trucks, and commuter traffic. Table 3.14-8 shows the approximate number of daily vehicles needed for construction of the Mill Site fish screen and conveyance facilities.

Because Diamond Avenue is currently designed to accommodate heavy commuter traffic, and construction traffic impacts would be temporary, traffic impacts to Diamond Avenue would be less than significant; therefore, no mitigation is required.

The impact of construction-related vehicles on Altube Avenue could directly damage roadways. This would be a significant impact.

Operation-related Impacts. ***No operations-related impacts are anticipated under Alternative 3; therefore, no mitigation is required.***

3.14.3 Mitigation

This section discusses mitigations for each significant impact described in Environmental Consequences.

1A: 4-month Improved Ladder Alternative

Mitigation 1A–TC1. To reduce construction-related impacts on traffic and roadways, the construction contractor would be required to develop a traffic control plan (TCP) with the Tehama County Public Works, City of Red Bluff Public Works, and Caltrans, which would be subject to review by Caltrans and the Public Works Director. This plan would ensure that construction traffic is routed in a way that maintains acceptable LOS levels on all affected roadways and intersections that are currently measured and used by project-related vehicles.

The TCP would address the structural capacity of roads and bridges along routes that could be traveled by construction-related vehicles. The TCP would ensure that the structural integrity of those roads and bridges would not be damaged by construction-related vehicle trips. If damage occurs, road surface would be repaired or replaced on Sale

Lane and/or Altube Avenue. This mitigation would reduce the impact to a less than significant level.

Mitigation 1A–TC2. To reduce construction-related impacts on traffic and roadways, the construction contractor would be required to develop a TCP with the Tehama County Public Works, City of Red Bluff Public Works, and Caltrans, which would be subject to review by Caltrans and the Public Works Director. This plan would ensure that construction traffic is routed in a way that maintains acceptable LOS levels on all affected roadways and intersections that are currently measured and used by project-related vehicles.

The TCP would address the structural capacity of roads and bridges along routes that could be traveled by construction-related vehicles. The TCP would ensure that the structural integrity of those roads and bridges would not be damaged by construction-related vehicle trips. If damage occurs, road surface would be repaired or replaced on Sale Lane and/or Altube Avenue. This mitigation would reduce the impact to a less than significant level.

1B: 4-month Bypass Alternative

Mitigation 1B–TC1. See Mitigation 1A–TC1.

Mitigation 1B–TC2. See Mitigation 1A–TC2.

2A: 2-month Improved Ladder Alternative

Mitigation 2A–TC1. See Mitigation 1A–TC1.

Mitigation 2A–TC2. See Mitigation 1A–TC2.

2B: 2-month with Existing Ladders Alternative

Mitigation 2B–TC1. See Mitigation 1A–TC2.

3: Gates-out Alternative

Mitigation 3–TC1. See Mitigation 1A–TC1.

3.15 Noise

3.15.1 Affected Environment

This section presents an evaluation of potential noise resulting from the construction and operation of proposed right bank and left bank fish ladders; fish screen, pump station, and conveyance facility; and bypass channel. An essential part of this assessment is a comparison of expected noise levels from the operation of the proposed project with acceptable noise levels presented in applicable regulations.

An essential part of this assessment is a comparison of expected noise levels from the operation of the proposed project with acceptable noise levels presented in applicable regulations.

Fundamentals of Acoustics

Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Noise can be measured in several ways depending on the source of the noise, the receiver, and the reason for the noise measurement. Table 3.15-1 summarizes the technical noise terms used in this subsection.

In this section, some statistical noise levels are stated in terms of decibels on the A-weighted scale (dBA). Noise levels stated in terms of dBA reflect the response of the human ear by filtering out some of the noise in the low- and high-frequency ranges that the ear does not detect well. The A-weighted scale is used in most ordinances and standards. The equivalent sound pressure level (L_{eq}) is defined as the average noise level, on an energy basis, for a stated period of time (such as hourly).

In practice, the level of a sound source is conveniently measured using a sound-level meter that includes an electrical filter corresponding to the A-weighted curve. The sound-level meter also performs the calculations required to determine the L_{eq} for the measurement period. The following measurements relate to the noise level distribution during the measurement period. The L_{90} measurement represents the noise level exceeded during 90 percent of the measurement period. Similarly, L_{10} represents the noise level exceeded for 10 percent of the measurement period.

The effects of noise on people fall into three general categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with such activities as speech, sleep, and learning
- Physiological effects such as startling and hearing loss

In most cases, environmental noise produces effects in the first two categories only. However, workers in industrial plants may experience noise effects in the third category. No completely satisfactory way exists to measure the subjective effects of noise, nor to measure the corresponding reactions to annoyance and dissatisfaction. This lack of a common standard is primarily a result of the wide variation in

In general, the more the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be.

individual thresholds of annoyance and habituation to noise. Thus, an important way to determine a person's subjective reaction to a new noise is to compare the noise with the existing or "ambient" environment to which that person has adapted. In general, the more the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual (California Energy Commission, 2001).

TABLE 3.15-1
Definitions of Acoustical Terms

Term	Definitions
Ambient noise level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	Noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level.
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the reference pressure to the sound pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency (hertz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-weighted sound level (dBA)	The sound pressure level in decibels as measured on a sound-level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted unless stated otherwise.
C-weighted sound level (dBC)	The sound pressure level in decibels as measured on a sound-level meter using the C-weighted filter network. The C-weighted filter does not de-emphasize the very low and very high frequency components of the sound. It is a flatter weighting where each frequency has an almost equal weighting. It is therefore more sensitive to low frequencies than the A-weighting.
Equivalent noise level (L_{eq})	The energy average A-weighted noise level during the measurement period.
Percentile noise level (L_n)	The A-weighted noise level exceeded during "n" percent of the measurement period, where "n" is a number between 0 and 100 (e.g., L_{90}).
Community noise equivalent level	The average A-weighted noise level during a 24-hour day, obtained after the addition of five decibels to sound levels from 7 p.m. to 10 p.m. and after the addition of ten decibels to sound levels between 10 p.m. and 7 a.m.
Day-night noise level (L_{dn} or DNL)	The average A-weighted noise level during a 24-hour day, obtained after the addition of 10 decibels from 10 p.m. to 7 a.m.

Sources: Beranek, 1988; California Department of Health Services, 1976.

With regard to increases in A-weighted noise level, knowledge of the following relationships will be helpful in understanding this subsection (Kryter, 1970):

- Except in carefully controlled laboratory experiments, the human ear cannot perceive a change of 1 dB.
- Outside the laboratory, a 3-dB change is considered a just-perceivable difference.
- A change in level of at least 5 dB is required before any noticeable change in community response can be expected.
- A 10-dB change is subjectively heard as approximately a doubling in loudness and will almost certainly cause an adverse community response.

Table 3.15-2 shows the relative A-weighted noise levels of common sounds measured in the environment and in industry for various sound levels.

TABLE 3.15-2
Typical Sound-level Measurements

Noise Source or Environment	A-Weighted Sound Level in Decibels	Subjective Impression
	140	
Civil defense siren (100 feet)	130	
Jet takeoff (200 feet)	120	Pain threshold
Rock music concert	110	
Pile driver (50 feet)	100	Very loud
Ambulance siren (100 feet)	—	
Boiler room	90	
Freight cars (50 feet)	—	
Printing press plant		
Pneumatic drill (50 feet)	80	
Kitchen with garbage disposal running		
Freeway (100 feet)	—	
	70	Moderately loud
Vacuum cleaner (10 feet)	60	
Data processing center		
Department store	—	
Light traffic (100 feet)	50	
Private business office		
Large transformer (200 feet)	—	
	40	Quiet
Soft whisper (5 feet)	30	
Quiet bedroom		
Recording studio	20	
	10	Hearing threshold

Sources: Peterson and Gross, 1974; California Energy Commission, 2001.

Noise Standards

The project is located within the County of Tehama. Although the County requirements would ultimately apply to the project, because of the proposed project's proximity to the City of Red Bluff boundary, the City's guidance is included for comparison purposes. The County and City General Plan Noise Elements, Desired Ambient Exterior Noise Levels, and Land Use Compatibility for Community Noise Environments are summarized in Tables 3.15-3 and 3.15-4.

TABLE 3.15-3
Tehama County General Plan Land Use Classification, Desired Ambient Exterior Noise Levels

Land Use Category	Time Zones	Desired Ambient Level, dB(A)	
Residential, rural-suburban	10 p.m. to 7 a.m.	40 – 45	- 60[a]
	7 a.m. to 10 p.m.	45 – 50	
Residential, suburban	10 p.m. to 7 a.m.	45 – 50	- 60 [a]
	7 a.m. to 10 p.m.	50 – 55	
Residential, low density urban	10 p.m. to 7 a.m.	50 – 55	- 60 [a]
	7 a.m. to 10 p.m.	55 – 60	
Residential, med./high density	10 p.m. to 7 a.m.	55 – 60	- 60 [a]
	7 a.m. to 10 p.m.	60 – 65	
Commercial zones, districts	10 p.m. to 7 a.m.	65 – 70	
	7 a.m. to 10 p.m.	70 – 75	
Industrial zones, districts	24 hours	75	

[a]Proposed where transportation noise is a significant factor (Tehama County General Plan, 1974).

TABLE 3.15-4
City of Red Bluff General Plan Land Use Classification, Land Use Compatibility for Community Noise Environments [a]

	Community Noise Exposure L_{dn}, dB			
Land Use Category	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Conditionally Unacceptable
Residential – Low-density single family, duplex, mobile homes	50 – 60	55 – 70	70 – 75	75 – 85
Residential – Multi-family	50 – 65	60 – 70	70 – 75	75 – 85
Transient Lodging – Motels, Hotels	50 – 65	60 – 70	70 – 80	80 – 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 – 70	70 – 80	80 – 85
Auditoriums, Concert Halls, Amphitheaters		50 – 70	65 – 85	
Sports Arena, Outdoor Spectator Sports		50 – 75	70 – 85	
Playgrounds, Neighborhood Parks	50 – 70		67.5 – 75	72.5 – 85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 75		70 – 80	80 – 85
Office Buildings, Business Commercial and Professional	50 – 70	67.5 – 77.5	75 – 85	
Industrial, Manufacturing Utilities, Agriculture	50 – 75	70 – 80	75 – 85	

[a]City of Red Bluff, 1993.

Definitions of noise standards are provided below.

Normally Acceptable. Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable. New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and necessary noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable. New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable. New construction or development should generally not be undertaken.

Existing Environment

The right bank consists primarily of industrial zoned and government land. The Mill Site and Pactiv land consist primarily of industrial activities. The most predominant sources of noise include general traffic in and out of the area, I-5 traffic, and train traffic.

Current noise sources at RBDD right bank facilities include the tailwater pump station and RPP.

The remainder of the right bank facilities are on land owned by USBR, and are under United States government jurisdiction. Current noise sources at RBDD facilities include the tailwater pump station and RPP (when the diversion dam is in the gates-in position). The closest sensitive receptor to the right bank facilities is the Discovery Center on the left bank, approximately 1,000 feet from the right bank.

Left Bank. The left bank primarily consists of the Recreation Area. Residential areas are well over 1,000 feet north of the Recreation Area, on Sale Lane. Located in the Recreation Area, are the Discovery Center and Sycamore Grove Campground. The Discovery Center is adjacent to the Sacramento River, just north of RBDD. It is used for educational purposes, and is open Tuesday through Sunday from 11 a.m. to 4 p.m. Schools in the surrounding area make daily trips to the Discovery Center during the spring months and use the Recreation Area grounds for riparian and oak lessons, nature walks, and classes. In addition, the Discovery Center Charter School meets in the area at least 2 days a week during the school year. The camping facilities are available year-round for overnight use. The most predominant sources of noise include general traffic in and out of the Recreation Area, airplanes, and birds.

The most predominant sources of noise at the left bank include general traffic in and out of the Recreation Area, airplanes, and birds.

3.15.2 Environmental Consequences

Methodology

Construction noise levels were estimated using EPA's *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances* (1971). These noise levels are estimates because the amount and type of construction equipment to be used, the location and duration of use, and the exact noise characteristics of each piece of equipment cannot be predicted with certainty. The assumptions used in this analysis are, however, typical for construction of industrial developments. Construction activities are expected to occur primarily during daytime hours (7 a.m. to 7 p.m.).

Construction activities are expected to occur primarily during daytime hours (7 a.m. to 7 p.m.).

The project is wholly located within the County of Tehama; therefore, County noise standards will be used for this analysis. The Tehama County noise element of the General Plan (1974) indicates that noise is a minor problem with respect to the total planning area of approximately 5,000 square miles. Because the general planning area does not contain a rapid transit system, and airports are not used for scheduled airline purposes or large commercial jet engine aircraft, the noise element is primarily directed to highway and freeway noise. The noise element does not set standards for items such as construction noise.

Significance Criteria

Significance criteria represent the thresholds that were used to identify whether an impact would be potentially significant. These criteria are based on Appendix G of the *CEQA Guidelines* and professional judgment.

Noise impacts would be significant if they would result in any of the following:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

No Action Alternative

No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth

pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

1A: 4-month Improved Ladder Alternative

Construction-related Impacts.

Impacts 1A-N1: Discovery Center and Sycamore Grove Campground.

Ambient noise levels would be expected to increase during project construction. The phases associated with project construction would include clearing, excavating, installing sheet pile, and constructing the fish ladders and screens. Noise emissions from construction equipment at a distance of 50 feet from noise sources would range from between 95 to 75 dBA. Table 3.15-5 lists the estimated noise emissions of the construction equipment likely to be used for project construction.

TABLE 3.15.5
U.S. General Services Administration Maximum Noise Levels Allowable for Government Contracts

Equipment	Sound Level (dBA) at 50 feet
Earthmoving	
Front Loader	75
Backhoe	75
Dozer	75
Tractor	75
Scraper	80
Grader	75
Truck	75
Paver	80
Impact	
Pile driver	95
Jack hammer	75
Rock drill	80
Pneumatic drill	80
Materials handling	
Concrete mixer	75
Concrete pump	75
Crane	75
Derrick	75
Stationary	
Pump	75
Generator	75
Compressor	75
Other	
Saw	75
Vibrator	75

Source: Sincero and Sincero, 1996.

Impacts from construction would be less than significant because construction noise would not violate established noise standards for the County; therefore, no mitigation is required.

Operations-related Impacts.

Impact 1A–N2: Discovery Center. Operations of the proposed pump station would not significantly increase ambient noise levels at the Discovery Center; thus, the impact would be less than significant.

The impact from operations on ambient noise levels at the Discovery Center would be less than significant; therefore, no mitigation is required.

1B: 4-month Bypass Alternative

Construction-related Impacts.

Impacts 1B–N1: Discovery Center and Sycamore Grove Campground. Ambient noise levels would be expected to increase during project construction. The phases associated with project construction include clearing, excavating, installing sheet pile, and constructing the fish ladders and screens. Noise emissions from construction equipment at a distance of 50 from noise sources would range from between 95 to 75 dBA. Table 3.15-5 above lists the estimated noise emissions of the construction equipment likely to be used for project construction.

Temporary impacts would also occur as a result of construction to the use of, the Discovery Center. Schools from the area make daily trips to the center during the spring months. If construction of the bypass channel were to occur during the spring time, increased noise levels associated with construction activity might conflict with the riparian and oak lessons and hikes that occur with the daily trips.

Impacts from construction would be less than significant because construction noise would not violate established noise standards for the County; therefore, no mitigation is required.

Operations-related Impacts.

Impact 1B–N2: Discovery Center. Impacts from operations under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A–N2).

The impact from operations on ambient noise levels at the Discovery Center would be less than significant; therefore, no mitigation is required.

2A: 2-month Improved Ladder Alternative

Construction-related Impacts.

Impacts 2A–N1: Discovery Center and Sycamore Grove Campground. Impacts from construction under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–N1).

Impacts from construction would be less than significant because construction noise would not violate established noise standards for the County; therefore, no mitigation is required.

Operations-related Impacts.

Impact 2A–N2: Discovery Center. Impacts from operations under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–N2).

2B: 2-month with Existing Ladders Alternative

Construction-related Impacts.

Impacts 2B–N1: Discovery Center and Sycamore Grove Campground. Impacts from construction under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–N1).

Impacts from construction would be less than significant because construction noise would not violate established noise standards for the County; therefore, no mitigation is required.

Operation-related Impacts.

Impact 2B–N2: Discovery Center. Impacts from operations under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–N2).

The impact from operations on ambient noise levels at the Discovery Center would be less than significant; therefore, no mitigation is required.

3: Gates-out Alternative

Construction-related Impacts.

Impact 3–N1: Discovery Center and Sycamore Grove Campground. Impacts from construction under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–N1).

Impacts from construction would be less than significant because construction noise would not violate established noise standards for the County; therefore, no mitigation is required.

Operation-related Impacts.

Impact 3A–N2: Discovery Center. Impacts from operations under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–N2).

The impact from operations on ambient noise levels at the Discovery Center would be less than significant; therefore, no mitigation is required.

3.15.3 Mitigation

Although mitigation is not required for construction-related noise, methods for reducing noise emissions are included in an effort to further reduce noise impacts, if necessary. If specific noise complaints are received during construction, one or more of the following noise mitigation measures would be implemented:

- Restrict construction within 1,000 feet of campground to daytime hours. No construction would be performed within 1,000 feet of camping facilities on Sundays, legal holidays, or between the hours of 7:00 p.m. and 7:00 a.m. on other days. Any variance from this condition must be approved by the USFS or County.
- All equipment would have sound-control devices no less effective than those provided on the original equipment. No equipment would have any unmuffled exhaust.

As directed by the USFS and/or the County, the contractor would implement appropriate noise mitigation measures, including, but not limited to, changing the location of stationary construction equipment, shutting off idling equipment, rescheduling construction activity, notifying the USFS or Discovery Center in advance of construction work, or installing acoustic barriers around stationary construction noise sources.

3.16 Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," dated February 11, 1994, requires agencies to identify and address disproportionately high and adverse human health or environmental effects of their actions on minorities and low-income populations and communities, as well as the equity of the distribution of the benefits and risks of their decisions. Environmental justice addresses the fair treatment of people of all races and incomes with respect to actions affecting the environment. Fair treatment implies that no group of people should bear a disproportionate share of negative impacts from an environmental action. To comply with the environmental justice policy established by the Secretary of the Interior, all U.S. Department of Interior agencies are to identify and evaluate any anticipated effects, direct or indirect, from the proposed project, action, or decision on minority and low-income populations and communities, including the equity of the distribution of the benefits and risks. Accordingly, this section examines the anticipated impacts associated with the alternatives with respect to potentially affected minority and economically disadvantaged groups.

Environmental justice addresses the fair treatment of people of all races and incomes with respect to actions affecting the environment.

3.16.1 Affected Environment

In 1997, approximately 20 percent of the population in Tehama County was living in poverty. The 1997 median household income for Tehama County was approximately $28,000 per year, over $10,000 less than the average California income.

According to the 2000 Census, the vast majority of the population (approximately 85 percent) in Tehama County consists of white persons. The remainder of the populace comprises primarily persons of Hispanic or Latino origin. Specific demographic information about Tehama County is limited; however, the majority of the population in the County is centered around the City of Red Bluff and I-5. The large portion of the county's industry is based on agriculture. Of Tehama County's 1.9 million acres, approximately 900,000 acres (47 percent) is in farmland.

The Sacramento River flows through the center of the City of Red Bluff. When RBDD gates are in the down position, the river rises approximately 12 to 15 feet just south of the City of Red Bluff, and forms what is called Lake Red Bluff. The lake is used by local residents and visitors from out of town for recreational purposes. This provides economic benefits for the general surrounding area in the form of increased patronage of surrounding businesses. There is no known minority group that is associated disproportionately with this area. No specific

group receives disproportionate economic or social benefits from the recreational uses of the lake.

Lake Red Bluff annually hosts the Nitro National drag boat races during Memorial Day weekend. The city receives beneficial economic impacts from this specific event. A large majority of the participants from this event are people who do not live in the area, and patron local motel and restaurant-type facilities.

3.16.2 Environmental Consequences

Methodology

The analysis of environmental justice impacts examined the extent to which each alternative would impact or benefit the local economy and how these impacts and benefits might affect different socioeconomic groups. Particular emphasis was given to economic, recreation, and aesthetic resources associated with Lake Red Bluff. For more information on these topics see Sections 3.5 (Recreation), 3.12 (Aesthetic and Visual Resources), and 3.10 (Socioeconomics).

No Action Alternative

No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

1A: 4-month Improved Ladder Alternative

Construction-related Impacts.

Impact 1A–EJ1: City of Red Bluff Economy. Construction of the facilities would offer temporary beneficial impacts primarily to the City of Red Bluff economy. Increased patronage from construction personnel would benefit local facilities in addition to local companies that become directly involved in portions of the construction effort. No definable socioeconomic groups would be disproportionately affected by these activities.

Impacts from construction on defineable socioeconomic groups would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 1A–EJ2: Land. There would be no substantial environmental justice impacts under Alternative 1A. Currently, the land that would be developed for the proposed project is vacant.

There would be no construction- or operations-related impact on land; therefore, no mitigation is required.

1B: 4-month Bypass Alternative

Construction-related Impacts.

Impact 1B–EJ1: City of Red Bluff Economy. Construction impacts on the City's economy would be the same as those identified for Alternative 1A (see Impact 1A–EJ1).

Impacts from construction on defineable socioeconomic groups would be less than significant; therefore, no mitigation is required.

Impact 1B–EJ2: Sacramento River Discovery Center. There would be no substantial environmental justice impacts under this alternative. Currently, the land that would be developed for the pump station portion of the project is vacant; therefore, there would be no land impacts from the construction and operation of the pump station. However, the bypass channel would be constructed through an active park. The bypass would effectively cut off the Discovery Center and campground from the rest of the park, isolating them and reducing their value as recreational and educational amenities. Although this is not anticipated to have a disproportionate impact on any specific socioeconomic group, it would impact student groups that use the facility. Thus, impacts would be disproportionately borne by children.

Impacts on the Discovery Center from operations would be less than significant; therefore, no mitigation is required.

2A: 2-month Improved Ladder Alternative

Construction-related Impacts.

Impact 2A–EJ1: City of Red Bluff Economy. Construction impacts on the City's economy under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–EJ1).

Impacts from construction on defineable socioeconomic groups would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 2A–EJ2: Land. The main impact on land from the 2-month reduced gates alternative would be concentrated in the City of Red Bluff area. Recreational uses of the lake would be reduced as a result of reduced days that the lake would be formed. Revenue generated from the recreational uses of the lake benefit the local economy. One of the largest impacts of this alternative would be from the elimination of the drag boat event on Memorial Day weekend. This would negatively affect the local economy by significantly reducing seasonal patronage of local facilities. No specific socioeconomic group would be adversely affected more than any other group by the reduction of recreational uses on the lake. Currently, the land that would be developed for the proposed project is vacant.

There would be no construction- or operations-related impacts on land; therefore, no mitigation is required.

2B: 2-month with Existing Ladders Alternative

Construction-related Impacts.

Impact 2B–EJ1: City of Red Bluff Economy. Construction impacts on the City's economy under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–EJ1).

Impacts from construction on defineable socioeconomic groups would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 2B–EJ2: Land. Construction impacts on land under Alternative 2B would be the same as those identified for Alternative 2A (see Impact 2A–EJ2).

3: Gates-out Alternative

Construction-related Impacts.

Impact 3–EJ1: City of Red Bluff Economy. Impacts on the City's economy under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–EJ1).

Impacts from construction on defineable socioeconomic groups would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 3–EJ2: Land. The main impact from the year-round Gates-out Alternative would be concentrated in the City of Red Bluff area. Recreational uses of the lake would be reduced as a result of reduced days that the lake would be formed. Revenue generated from the recreational uses of the lake benefit the local economy. One of the largest impacts of this alternative would be from the elimination of the drag boat event on Memorial Day weekend. This would negatively affect the local economy by significantly reducing seasonal patronage of local facilities. No specific socioeconomic group would be adversely effected more than any other group by the reduction of recreational uses on the lake. Currently, the land that would be developed for the proposed project is vacant.

There would be no construction- or operations-related impacts on land; therefore, no mitigation is required.

3.16.3 Mitigation

No significant environmental justice impacts from construction or operations of the proposed alternatives have been identified; therefore no mitigation is provided.

4.0 Other Impacts and Commitments

4.1 Cumulative Conditions

Cumulative impacts are the impacts on the environment that result from the incremental impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or entity undertakes such other actions. It is recognized that the proposed action may be implemented in an interactive manner with other concurrent projects. In addition, these other projects may affect the impacts of the proposed actions. The cumulative analysis addresses impacts associated with several related actions including:

Cumulative impacts are the impacts on the environment that result from the incremental impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions.

- Implementation of Central Valley Project Improvement Act (CVPIA)
- SWRCB water rights process and CALFED Bay-Delta Program
- Deregulation of electric industry in California
- Changes in demand for agricultural products
- Changes to fisheries management
- Urbanization
- Changes in demand for recreational opportunities
- Total maximum daily load (TMDL)
- Trinity River Restoration Program (EIS/EIR)
- Sacramento County municipal and industrial water supply contracts
- Sacramento River Conservation Area Program (federal, state, and local agencies and private interest groups)
- Stream restoration and other salmonid habitat improvements in the upper Sacramento River
- Integrated Storage Investigations Program, specifically the North-of-the-Delta Offstream Storage Project (Storage Project)

Many other water resource activities are planned in the State of California. These include water transfer actions and conveyance facilities in the Central Valley and central and southern coastal areas, as well as wetlands and other habitat restoration projects in the Central Valley. The cumulative impact of these programs on the proposed action have the potential to be significant. The following actions are

described at length because, in some instances, they could potentially change the level of impacts to the natural or human environment from that which has been described in previous chapters. Given the uncertainty as to how, when, and to what degree each of these programs and activities will be implemented, this analysis identifies only the primary issues associated with each.

4.1.1 Implementation of Central Valley Project Improvement Act

On October 30, 1992, President Bush signed into law the Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575) that included Title XXXIV, the CVPIA. The CVPIA amends the previous authorizations of CVP to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic uses, and fish and wildlife enhancement as a project purpose equal to power generation. The CVPIA identifies a number of specific measures to meet these new purposes and directs the Secretary of the Interior to (1) operate the CVP consistent with these purposes, (2) meet federal trust responsibilities to protect the fishery resources of affected federally recognized Indian tribes, (3) meet all requirements of federal and California law, and (4) achieve a reasonable balance among competing demands for the use of CVP water.

As stated above, the implementation of CVPIA was modeled and included in the cumulative impact analysis. The ~~Draft~~ CVPIA PEIS, ~~which was released for public review in September 1997 and is available for review from USBR~~was approved in the January 9, 2001 Record of Decision. The CVPIA PEIS~~,~~ evaluated:

- Anadromous Fishery Restoration Program using flow and non-flow restoration methods, fish passage improvements, and Shasta Temperature Control Device
- Reliable water supply program for refuges and wetlands
- Land retirement program for willing sellers for land with poor drainage
- CVP water contract provisions for contract renewals, water pricing, water metering/monitoring, water conservation methods, and water transfers

Implementation of the alternatives considered in the ~~Draft~~ CVPIA PEIS would improve fish and wildlife habitats, but would also reduce water supply reliability to CVP water service contractors.

Implementation of the alternatives considered in the ~~Draft~~ CVPIA PEIS would improve fish and wildlife habitats, but would also reduce water supply reliability to CVP water service contractors. Assumed increases in groundwater pumping to substitute for decreased surface-water supplies would increase the potential for ground subsidence in portions of the Central Valley, as well as increase the cost of groundwater pumping. Some of the alternatives would increase the amount of fallow

land in portions of the Central Valley. The ~~Draft~~ CVPIA PEIS also considered acquisition of water from water rights holders for purposes of increasing in-stream fish flows. These actions could also lead to more fallowed lands. The regional economies could be impacted by primary and secondary impacts associated with the reduction in irrigated lands.

The ~~Draft~~ CVPIA PEIS alternatives also would modify the flow release patterns from CVP reservoirs by increasing releases in spring and reducing releases in summer. This change would reduce the amount of power generated at CVP facilities and substantially reduce the value of power produced. This would lead to an increase in power costs and a reduction in available CVP-generated power for preference power customers served by Western. In addition, changes in reservoir levels would potentially impact recreational use at various CVP and State Water Project reservoirs.

4.1.2 SWRCB Water Rights Process and CALFED Bay-Delta Program

The purpose of the SWRCB water rights process for Delta water quality and quantity is to develop a methodology to provide adequate flows to meet the new Delta water quality standards developed in 1995. The SWRCB process is evaluating several alternatives that would require different programs, including the CVP and State Water Project, to release water in a manner that would protect Delta quality. The purpose of the CALFED Bay-Delta Program is to develop a long-term solution to problems affecting the Delta. The CALFED program is evaluating alternatives to improve water quality and reliability, including several water storage options that include groundwater banking, off-stream surface-water storage, and conjunctive use, as well as several water conveyance alternatives in the Delta. Both the SWRCB and CALFED processes are intended to improve the Bay-Delta ecosystem and water quality, which would lead to increased salmon populations in Central Valley streams. Both processes may implement many of the same actions identified under the Draft CVPIA PEIS.

Both the SWRCB and CALFED processes are intended to improve the Bay-Delta ecosystem and water quality.

Under the SWRCB process, water rights holders use water in a new pattern that would reduce the need for releases by CVP and State Water Project to meet Delta water quality standards. These changes could increase water supply reliability of the CVP and State Water Project. However, the improvements to CVP water deliveries may be less than those realized by the State Water Project because of implementing CVPIA provisions, including increased in-stream flow releases in the Trinity River.

Under the CALFED process, storage, and conveyance alternatives are being evaluated that would restore water supply reliability, which was lost due to releases for habitat and water quality improvements. The new storage facilities could be designed to restore water supply

reliability losses caused by increased in-stream flow releases on the Trinity River. The Public Draft CALFED Bay-Delta PEIS/EIR was released for public review in June 1999 and is available from the CALFED Bay-Delta Program office.

The SWRCB is proceeding with a multi-phase water rights hearing on the Bay-Delta, including extension of the Bay-Delta Accord (Phase 1); the San Joaquin River Agreement (Phases 2, 2A, and 2B); the Suisun Marsh Agreement (Phase 3); Mokelumne and Sacramento River agreements (Phase 4); Compliance with the Flow-dependent Water Quality Objectives (Dissolved Oxygen and Salinity) of the Delta (Phase 5); the petition by USBR and DWR to combine their respective points of diversion in the southern Delta (Phase 6); the USBR's petition to expand and consolidate the CVP places and purposes of use (Phase 7); and Phase 8, which is intended to deal with the issues/water right holders remaining after the previous phases. Phase 8 spurred the creation of the Sacramento Valley Water Management Agreement (Agreement), in which a number of water agencies agreed to cooperate with regard to water management in the Sacramento Valley. The Agreement principles are as follows:

- The state and federal export projects will continue to meet water quality standards in the Delta until a long-term solution is negotiated as part of the Agreement
- The parties fully commit to an integrated water management and water supply development program for the Sacramento Valley that will meet 100 percent of the water needs in the Sacramento Valley, improve the water supplies and quality for other areas of the state, and provide water for environmental purposes
- The parties will work together to secure public funding for water management and supply projects in the Sacramento Valley that will help assure environmental restoration, optimize the use of existing water supplies, and enable local interests to develop additional water supplies in areas of origin
- The parties will prepare a joint work plan for short-term Sacramento Valley water management projects to implement the agreement; work plans on longer-term projects will follow
- The parties will evaluate projects and work plans against the Agreement's goals and principles on an ongoing basis to ensure that water needs are being met

The primary water management tools that will be used in implementing the Agreement are the following:

- Coordinated use of storage facilities
- Conjunctive management of surface water and groundwater

- Management and recovery of tailwater through major drains
- Water conservation
- Transfers and exchanges among Sacramento Valley water users and other water users in the state
- Increased surface storage

The action alternatives considered in the Fish Passage Improvement Project at the Red Bluff Diversion Dam could be a part of future water management actions in the Sacramento River. An example is discussed below, under the Integrated Storage Investigation.

4.1.3 Deregulation of Electric Industry in California

Assembly Bill 1890 (AB 1890) was passed in 1996 by the California State Legislature. AB 1890 provides the legal framework for a newly organized electric industry. The basic intent of AB 1890 is to increase competition and choices, lower prices, and assure the same reliable service. The power generation component of electric service was deregulated by the legislation because it is a "commodity." The two other components, transmission and distribution, will remain regulated under the legislation. A newly established Independent System Operator manages the entire long-distance transmission grid (the structure of large power lines, towers, and transformers connecting California consumers and power generation sources). An independent organization, the Power Exchange (PX), was created as a power pool for the state. Instead of selling electricity directly to customers, all investor-owned utilities in California compete to sell generation resources through PX. Other independent electricity producers may also sell through PX. The premise is that competitive bidding at PX will decrease overall generation prices.

As of March 31, 1998, customers of PG&E, San Diego Gas & Electric, and Southern California Edison Company were able to choose another electric service provider for the generation portion of their electricity. State law allows each municipally owned electric utility to decide whether or not their customers will have a choice of electric service providers.

Energy users have the opportunity to purchase electricity from independent generators that may or may not be located in the state. This will probably lead to a reduction in energy costs for large users or users that purchase electricity in a group manner. This also may lead to users transferring generators to "green power," which could include hydropower or other non-emission power sources.

The action alternatives considered as part of the Fish Passage Improvement Project could reduce the amount of CVP power available for use by preference power customers, requiring them to look to other sources of electricity to offset potential shortfalls.

The action alternatives considered as part of the Fish Passage Improvement Project could reduce the amount of CVP power available for use by preference power customers, requiring them to look to other sources of electricity to offset potential shortfalls.

Significant cumulative impacts (primarily air quality impacts) could occur if these reductions in power supplies induced increased generation from either existing gas-fired generators or the construction of new facilities. It is important to note however, that the facilities that generate power from fossil fuel sources are generally subject to stringent air quality regulation pursuant to the Federal Clean Air Act and, within California and many other states, state statutes and regulations. These regulations frequently require some sort of mitigation (e.g., offsets and/or best available control technology) to reduce the severity of localized and regional air quality impacts. Because electricity in the United States is supplied through a complicated grid covering numerous states, and because individual utilities decide where to purchase power based on a number of changing factors such as price, it is impossible at present to predict with any level of reliability where localized or regional air pollution increases might occur.

It is possible that future storage facilities considered under CALFED or other storage investigations could increase power generation. However, other aspects of the CALFED alternatives would probably reduce power availability from CVP and other hydropower facilities, and the time-frame for the construction of such facilities is speculative.

4.1.4 Changes in Demand for Agricultural Products

The analyses in this DEIS/EIR were not based on agricultural prices and costs. However, changes to prices and costs could change the crop mixes farmers choose to plant in the TCCA service area. If this occurs, then the estimated crop demands presented in this DEIS/EIR could change. Changes in demand could change the ratio of permanent to annual crops. If more permanent crops were planted, the effects of changes in annual water reliability could become more significant.

4.1.5 Changes to Fisheries Management

Artificial propagation of game fish, including West Coast anadromous fish, has been an important tool in fishery management. Numerous federal, state, and local fish hatcheries and rearing facilities have made successful and substantial contributions to the size of anadromous fish populations. Most of these programs are well funded by their respective agencies. Increased hatchery production could increase the number of salmon in the ocean, and therefore, increase the number of returning fish to all streams. However, concerns have been raised about the use of hatchery fish that are not subject to natural selection during reproduction and rearing. Hatchery-raised fish may also reduce genetic

variability and lead to genetic abnormalities that are transferred to natural stock. Hatchery-raised fish may also be more subject to disease.

Salmon spend over two-thirds of their life cycle in the ocean. During this stage of their lives they are difficult to study. Both sport and commercial harvests appear to have a major role in returning fish populations. However, until harvest impacts can be discerned from natural phenomena of the sea (e.g., changes to temperature, upwellings, currents, and food availability), there is no exact method to assess the impacts of ocean fisheries. NMFS has made advances in resolving some of these issues and will continue to address these concerns, leading to improved management of ocean fisheries. All of the alternatives focus on restoring natural fish production and, thus, are projected to increase the number of fish produced and available for harvest accordingly.

4.1.6 Urbanization

California State Department of Finance, Demographic Research Unit has estimated that by the year 2020, California's population will reach 45.8 million. This is an increase of over 10 million people from the state's current population. The majority of the population increase is expected to occur in California's Central Valley. Tehama, Glenn, and Colusa counties are expected to have a greater than 50 percent population increase over the next 2 decades, and Yolo County is expected to have a 30 to 50 percent population increase.

Urbanization in these areas is expected to result in significant conversion of agricultural lands. Throughout California, it is estimated that low-density urban sprawl could consume more than 1 million acres of farmland by the year 2040. Conversion of agricultural land could be an issue faced by TCCA member districts in the foreseeable future.

Throughout California, it is estimated that low-density urban sprawl could consume more than 1 million acres of farmland by the year 2040. Conversion of agricultural land could be an issue faced by TCCA member districts in the foreseeable future.

4.1.7 Changes in Demand for Recreational Opportunities

The impact analyses in this DEIS/EIR assumed a constant demand for recreational opportunities not associated with the Sacramento River and a constant revenue source. Changes in demand for recreational opportunities are difficult to project. It is possible that an increase in Sacramento fish stocks could increase the demand for river fishing opportunities, which would offset any impacts to the loss of Lake Red Bluff. However, demand for flat-water recreation such as is provided by Lake Red Bluff could also be increasing, as evidenced by increasing gate receipts at the annual boat drag races. Forecasting the precise direction of this demand is speculative at this time.

4.1.8 Total Maximum Daily Load

The Sacramento River, from Shasta Dam to Red Bluff and from Red Bluff to Delta, is listed on the State of California's Clean Water Act Section 303(d) Impaired Water Bodies list (303(d) list). The 303(d) list

describes waters that do not fully support all beneficial uses or are not meeting water quality objectives.

The Sacramento River from Shasta Dam to Red Bluff is identified as impaired by metals such as cadmium, copper, and zinc, and from Red Bluff to the Delta as impaired by diazinon and mercury. For such water bodies, the Clean Water Act requires the development of TMDL allocations for the pollutants of concern. A TMDL allocation must estimate the total maximum daily load, with seasonal variations and a margin of safety, for all suitable pollutants and thermal loads, at a level that would assure protection and propagation of a balanced indigenous population of fish, shellfish, and wildlife.

The Central Valley RWQCB completed a draft TMDL program in September 2001 for cadmium, copper, and zinc loading into the upper Sacramento River. The upper Sacramento River is designated as the area between Keswick Dam and Cottonwood Creek.

Implementation of the respective TMDLs would likely require incorporation into Central Valley RWQCB's Basin Plan through an amendment process. To date, the majority of the Sacramento River from Keswick Dam to the Delta has been incorporated into the Basin Plan. However, ultimate completion and adoption of TMDLs for the additional constituents listed in the Sacramento River could assist in the long-term improvement of water quality and fish habitat in the Sacramento River and Delta.

It is possible that TMDL management would require changes in diversions and discharges along the Sacramento River. Such changes could affect operation of any action alternative selected in this project.

4.1.9 Trinity River Restoration Program (EIS/EIR)

The Trinity River Division was authorized by Congress in part to increase the supply of water available for irrigation and other beneficial uses in the Central Valley. Facilities were authorized for control and storage of water from Clear Creek and Trinity River flows. Water from the Trinity River is stored in Trinity Lake (formerly Claire Engle Lake) behind Trinity Dam. Lewiston Dam regulates flows to meet the downstream requirement of the Trinity River basin. Water from the Trinity River is diverted through J. F. Carr and Spring Creek power plants to the Sacramento River to meet the water demands in the Sacramento Valley and other areas of CVP.

In October 2000, USFWS prepared a DEIS/EIR titled "Trinity River Mainstem Fishery Restoration Program." The DEIS/EIR addressed the environmental issues, alternatives, and impacts associated with restoration of the natural production of anadromous fish on the Trinity River mainstem downstream of Lewiston Dam.

The purpose for the project was to restore and maintain the natural production of anadromous fish on the Trinity River mainstem downstream of Lewiston Dam.

The need for this action resulted from Congress' (1) mandate that diversions of water from the Trinity River to the CVP not be detrimental to Trinity River fish and wildlife resources; (2) finding that construction and operation of the Trinity River Division has contributed to detrimental effects to habitat and has resulted in drastic reductions in anadromous fish populations; (3) finding that restoration of depleted stocks of naturally produced anadromous fish is critical to the dependent tribal, commercial, and sport fisheries; and (4) confirmation of the federal trust responsibility to protect tribal fishery resources affected by the Trinity River Division.

The ROD was signed by the Secretary of the Interior and issued in December 2000. However, the EIR was not certified by Trinity County and it is not a finalized document.

Just prior to the issuance of the ROD, the Westlands Water District, the Northern California Power Agency, and the Sacramento Municipal Utility District filed a lawsuit against the federal agencies materially involved in the decision-making process (USFWS, USBR, and NMFS). Plaintiffs claimed that they would suffer irreparable injury as a result of implementing the action set out in the ROD, specifically with regard to the effect of the ROD's flow regime on the changed condition of California's energy crisis and the effects that compliance with the biological opinions issued on the Trinity River Mainstem Fishery Restoration Program would have upon CVP operations. The court granted the plaintiffs' request by issuing a preliminary injunction that limits the increase in flows in the Trinity River that may be implemented under the ROD, but which allows all other actions outlined in the ROD to move ahead. The court suggested verbally that the range of alternatives evaluated in the EIS/EIR may not have been adequate, implying that it would be prudent for the U.S. Department of the Interior to analyze the alternative presented in outline form by the Sacramento Municipal District alternative during the public comment period.

Final resolution of the Trinity River flow decision could affect diversions and discharges in the Sacramento River and alter operations of the action alternatives.

A Supplemental Draft EIR is currently being prepared that addresses the issues discussed above, plus a number of additional actions, to ensure the adequacy of the document for CEQA, as well as NEPA, purposes.

Final resolution of the Trinity River flow decision could affect diversions and discharges in the Sacramento River and alter operations of the action alternatives.

4.1.10 Sacramento River Conservation Area Program

SB 1086, Upper Sacramento River Fisheries and Riparian Habitat Management Plan, was passed in 1986, and called for development of a management plan to protect, restore, and enhance the fish and riparian habitat and associated wildlife of the upper Sacramento River (from Keswick Dam to the confluence with the Feather River). The plan was prepared by a 25-member Advisory Council and a working-level Action Team, both representing a wide range of federal, state, and local agencies and private interests concerned with the upper Sacramento River. Following more than 50 lengthy meetings and workshops over a 2-year period, the plan was completed and submitted to the State Legislature in 1989. This was an early example of a "consensus planning" process, often cited as the "prototype" example in California.

The management plan contains a conceptual proposal for riparian habitat restoration along the main river and its tributaries, and a more specific fishery restoration plan with 20 specific actions intended to restore the salmon and steelhead fisheries of the river and its tributaries. In 1993, Secretary for Resources Wheeler reconvened the SB 1086 Council and asked it to advise state agencies responsible for implementing those portions of the CVPIA that are likely to affect the upper Sacramento River and adjacent lands and complete the earlier work concerning riparian habitat protection and management, including development of a specific implementation program.

Since 1993, the multi-agency Riparian Habitat Committee of the Advisory Council and a multitude of stakeholders have worked to develop a comprehensive Sacramento River Conservation Area Plan for the river. The group has now reached consensus and recently published the Sacramento River Conservation Area Handbook. The handbook is a creative way to provide a comprehensive understanding of the Sacramento River ecosystem for both the public and agencies managing the river. The committee has developed a Memorandum of Agreement (MOA) among these diverse groups, which is being reviewed prior to final agreement. The committee has hired a coordinator and plans to establish a non-profit organization to coordinate and manage the program.

The handbook, MOA, and non-profit organization represent the beginning of a new era in river corridor management where all stakeholders (including local, state, and federal agencies; public interest groups; and landowners) are closely involved in the planning and decision-making process, as well as the implementation.

Fish passage improvements resulting from the action alternatives considered in this DEIS/EIR could affect habitat programs in the Sacramento River Conservation Area.

4.1.11 Habitat Improvements in the Upper Sacramento River

Several large-scale habitat improvement projects have been initiated in the Sacramento Basin upstream of RBDD. These projects include:

- Battle Creek Restoration Project
- Clear Creek Restoration Project
- ACID Fish Passage Improvement Project
- Ongoing improvements to Iron Mountain Mine water quality discharges
- Temperature Control Device on Shasta Dam

All of these projects have improved habitat for salmonids in the reach of the Sacramento River between Keswick Dam and RBDD. Implementation of the action items considered in this project would increase access to habitat improvements provided under these efforts.

4.1.12 Integrated Storage Investigations Program, Specifically the North-of-the-Delta Offstream Storage Project

The potential Storage Project could result in offstream reservoir capacity of up to 2.0 million acre-feet north of the Bay-Delta in the northern Sacramento Valley. The study of offstream storage north of the Delta was authorized by Proposition 204 and has been identified in concept through the CALFED Integrated Storage Investigations program. The storage concept was further developed through the 2000 CALFED Programmatic EIR/EIS (PEIR/EIS). The PEIR/EIS resulted in the adoption of a long-term comprehensive program to restore ecological health and improve water management for beneficial uses of the San Francisco Bay/Sacramento-San Joaquin River Delta system and its tributary watersheds. The Storage Project is a specific action that would implement, in part, the Preferred Programmatic Alternative adopted by the PEIR/EIS.

The objectives of the Storage Project are as directed in the PEIR/EIS ROD and consist of enhanced water management flexibility in the Sacramento Valley, reduced water diversion from the Sacramento River during critical fish-migration periods, increased reliability of supplies for a significant portion of the Sacramento Valley, additional storage, and operational benefits for other CALFED programs (including Delta water quality and the Environmental Water Account). Specific details on the beneficiaries of these objectives, conditions under which diversion could occur, means of conveyance, associated costs to beneficiaries for acquiring the water, and other implementation and operational details are being developed.

The Storage Project is currently undergoing separate environmental analysis and feasibility study. The state lead agency is DWR, and the federal lead agency is USBR. Multiple federal, state, and local agencies

have also been identified as participants in the analysis and study process, in addition to interested members of the public. Public scoping was conducted from October 2001 through January 2002. The DEIR/EIS and the Feasibility Study are expected to be available to the public in 2010.

Alternatives to the project, including a Preferred Alternative, are currently undergoing development. In addition to a No Project Alternative (existing conditions) and a No Action Condition (anticipated 2030 conditions if the project is not approved), the possible project alternatives as presented in the Notice of Preparation/Notice of Intent are summarized in Table 4.1-1. The Storage Project EIR/EIS will analyze a specific implementation action for program elements previously identified in the PEIR/EIS and, therefore, will tier from the programmatic document. The Storage Project EIR/EIS will specifically identify the benefits and impacts of the proposed offstream Storage Project and determine the significance of these impacts. Initial evaluation and scoping have identified that potential impacts could occur to environmental resources and socioeconomic conditions as a result of the construction and operation of surface storage, diversion, and conveyance facilities associated with the Storage Project. Table 4.1-2 summarizes the environmental resources and socioeconomic conditions that could be affected. The degree of the impact and potential mitigation if the impact is found to be significantly adverse is being developed as part of the EIR/EIS process.

~~The Storage Project could result in offstream reservoir capacity of up to 1.9 million acre-feet north of the Bay-Delta in the northern Sacramento Valley. The concept of offstream storage north of the Delta is authorized by Proposition 204 and has been identified in concept through the CALFED 1999 Integrated Storage Investigations program. The storage concept was further developed through the CALFED 2000 Programmatic EIR/EIS (PEIR/EIS). The PEIR/EIS resulted in the adoption of a long-term comprehensive program to restore ecological health and improve water management for beneficial uses of the San Francisco Bay/Sacramento-San Joaquin River Delta system and its tributary watersheds. The Storage Project is a specific action that would implement, in part, the Preferred Programmatic Alternative adopted by the PEIR/EIS.~~

~~The objectives of the Storage Project are as directed in the PEIR/EIS ROD and consist of: enhanced water management flexibility in the Sacramento Valley, reduced water diversion on the Sacramento River during critical fish migration periods, increased reliability of supplies for a significant portion of the Sacramento Valley, storage, and operational benefits for other CALFED programs (including Delta water quality and the Environmental Water Account). Specific details on the beneficiaries of these objectives, conditions under which diversion could occur, means of conveyance, associated costs to beneficiaries for acquir-~~

~~ing the water, and other implementation and operational details are being developed.~~

~~The Storage Project is currently undergoing separate environmental analysis and feasibility study. The lead agency for the EIR is DWR, and USBR for the EIS. Multiple federal, state, and local agencies have also been identified as participants in the analysis and study process, in addition to interested members of the public. Public scoping was conducted from October 2001 through January 2002. The DEIR/EIS and the Feasibility Study is expected to be available to the public in June 2003. It is expected that a ROD will be certified in August 2004.~~

~~Alternatives to the project, including a Preferred Alternative, are currently undergoing development. In addition to a No Project Alternative (the project would not be approved or constructed) and a No Action condition (anticipated 2020 conditions if the project is not approved), the possible project alternatives as presented in the Notice of Preparation/Notice of Intent are summarized in Table 4.1-1.~~

~~The Storage Project EIR/EIS will analyze a specific implementation action for program elements previously identified in the PEIR/EIS and therefore will tier from the programmatic document. The Storage Project EIR/EIS will specifically identify the benefits and impacts of the proposed offstream storage project and determine the significance of these impacts. Initial evaluation and scoping have identified that potential impacts may occur to environmental resources and socio-economic conditions as a result of the construction and operation of surface storage, diversions, conveyance, and groundwater storage facilities associated with the Storage Project. Table 4.1-2 summarizes the environmental resources and socioeconomic conditions that could be affected. The degree of the impact and potential mitigation if the impact is found to be significantly adverse is being developed as part of the EIR/EIS process.~~

4.1.13 Cumulative Impacts Analysis

The following presents a qualitative discussion of how the project alternatives may affect water management, water quality, fisheries, land use, biological resources, recreation, aesthetics, and power resources in the context of the cumulative condition. For this analysis, the CALFED PEIS/EIR best describes the applicable cumulative condition. At a programmatic level, the CALFED PEIS/EIR evaluated the environmental consequences of implementing the CALFED Program, which included the RBDD Fish Passage Improvement Project. This project-level EIS/EIR tiers from the CALFED PEIS/EIR. All of the action alternatives identified in this document were designed to meet the objectives of the CALFED Environmental Restoration Program as identified for RBDD. Fish Passage at RBDD was also identified as an item under CVPIA. Thus, this project-level EIS/EIR also tiers from the

CVPIA PEIS, although functionally, the CALFED PEIS/EIR includes most of the considerations from the CVPIA PEIS Cumulative Analysis.

TABLE 4.1-1
Possible Project Alternatives for Storage Project EIR/EIS

Possible Project Alternative	Features of Alternative
Sites Reservoir Alternative	Offstream reservoir with capacity of up to 1.9 maf, approximately 10 miles west of Maxwell, California. The alternative would inundate the communities of Sites and most of Antelope Valley. The main dams would be constructed on Funks Creek and Stone Corral Creek; up to nine saddle dams would be needed. Sources and conveyance options for this alternative include: • The use of the Glenn-Colusa Irrigation District diversion and canal, either in its current capacity or in an enlarged capacity • The use of the Tehama-Colusa diversion and canal in its current capacity or enlarged • A new diversion and conveyance facility from the Sacramento River near Moutlon Weir • A new diversion and conveyance facility from the Colusa Basin Drain • Diversion and conveyance from East Park Reservoir and/or Stony Gorge Reservoir • A combination of these options ~~A subalternative to the Sites Reservoir Alternative would include the integration of conjunctive use with operation of the reservoir.~~
Newville Reservoir	Offstream reservoir capacity between 1.9 to 3.0 maf, approximately 18 miles west of Orland, California. A single earth embankment on North Fork Stony Creek along with various saddle dams would create the impoundment area. Diversion and conveyance facilities would be needed because North Fork Stony Creek is a relatively small drainage area. Options being considered include: • Development of the Stony Creek Diversion to move water from Black Butte Lake to the proposed Newville Reservoir by canal to Tehenn Reservoir; Tehenn Reservoir would serve as a forebay/afterbay to the Thomes-Newville Reservoir • A direct canal from Black Butte Reservoir to Thomes-Newville Reservoir (to avoid a historical cemetery) • A diversion nearby Thomes Creek, which has an annual runoff of approximately 200 thousand acre-feet, would require a small dam and a pipeline over a ridge separating the creek from Thomas-Newville Reservoir • Diversion and conveyance facility from the Sacramento River • A combination of the above options ~~A subalternative to the Newville Reservoir Alternative would include the integration of conjunctive use with operation of the reservoir.~~
Other Possible Alternatives	Other possible alternatives that meet the project objectives but would not likely require the construction and operation of the Storage Project, such as conjunctive use or enlargement of the Shasta Reservoir as identified in CALFED's Onstream Storage Enlargement (Enlarged Shasta) investigation.

TABLE 4.1-2
Potential Environmental Resources and Socioeconomic Conditions Affected by Storage Project

Land Use Planning	Transportation and Traffic[a]	Aesthetics
Geology and Soils	Biological Resources	Cultural Resources
Geomorphology	Energy and Mineral Resources	Indian Trust Assets
Air Quality	Noise	Recreation[a]
Hydrology and Water Quality	Utilities and Service Systems	Hazards and Hazardous Materials
Public Service	Environmental Justice	Mandatory Findings of Significance

[a]Note that potential impacts to transportation and traffic, and recreation resources have not been identified for groundwater storage facilities associated with the Storage Project.

The *Guide to Regulatory Compliance for Implementing CALFED Actions* (CALFED Bay-Delta Program, 2001) provides the following guidance for analyzing cumulative impacts in project-level environmental documents that tier from the CALFED PEIS/EIR.

> *Tiered EISs and/or EIRs should incorporate the relevant cumulative and long-term impact analyses of the CALFED PEIS/EIR and add detail about other "reasonably foreseeable future projects" and their contribution to cumulative impacts. Any significant environmental impacts, including contributions to a cumulative impact that the PEIS/EIR did not address, need to be evaluated in the tiered environmental reviews.*

A summary of the beneficial and potentially adverse consequences identified in the CALFED Final PEIS/EIR are outlined below in Table 4.1-3. For a more detailed description of the effects described in the CALFED PEIS/EIR, please see documentation regarding that program. Table 4.1-3 also includes a general discussion of impacts from implementation of an action alternative as described in this EIS/EIR.

TABLE 4.1-3
Summary of Beneficial and Potentially Adverse Consequences Identified in the CALFED Final PEIS/EIR

	Environmental Consequence	
Resource	**CALFED**	**RBDD**
Water Supply and Water Management	Improvements to water supply through coordinated implementation of programs, potentially including new storage programs.	Improvements to water reliability through construction of additional pumping capacity.
Water Quality	Improved water quality from reduced concentrations of contaminants. Potential decreases in water quality if increased diversions occur in the Bay-Delta.	Potential for temporary impacts to water quality during construction.
Vegetation and Wildlife	Net increases in targeted habitat types. Potential increases in habitat fragmentation resulting from storage projects.	Temporary impacts from construction. Potential increases in riparian habitat if the Gates-out Alternative is selected.
Fisheries	Improvement to ecological processes that sustain fish populations. Potential negative impacts from operations in the Bay-Delta intended to improve water delivery capacity or from changes in flow patterns resulting from new offstream storage projects.	Decreases in delays affecting upstream migrating fish in the Sacramento River. The amount of benefit would depend on the alternative selected.
Recreation	Increased open space, increased quality of recreational experience.	Loss of lake-based recreation resource at Lake Red Bluff under 2-month Gates-in and Gates-out alternatives.
Land Use (Agricultural)	Increased certainty in water deliveries to agriculture. Some conversions of prime agricultural land, and conflicts with adjacent land uses.	Increased certainty in water deliveries to agriculture.
Power Resources	Some increase in hydropower generation if new storage is constructed. Decrease in amount of energy available for non-project uses.	Decrease in the amount of energy available for non-project use if the facility is determined to be eligible for PUP.
Aesthetics	Negative visual impacts from construction and operations of new facilities.	Negative impacts to the aesthetic character of Red Bluff if the 2-month Gates-in or Gates-out alternatives are selected.

4.2 Growth-inducing Analysis

A project could result in growth-inducing impacts through several means, including the removal of obstacles to population growth, or actions that encourage and facilitate other activities beyond those proposed by the project. The availability of adequate water supplies, employment opportunities, and improved cultural amenities are examples of actions that could be growth-inducing impacts. Growth inducement may or may not be detrimental, beneficial, or significant. However, if the induced growth impacted the environment, or the ability of agencies to provide public services to an extent not envisioned due to the project actions, the impacts would be considered to be adverse.

The existing TC Canal has the physical ability to convey massive volumes of water from the Sacramento River at RBDD. Currently, the only limitation is the inability to introduce large amounts of water into the canal during winter periods. If a large pumping system were installed at RBDD, it would be more feasible to produce large amounts of water during the winter high-flow periods. This would increase amounts of water available at all times of the year.

The existence of a pump station on the TC Canal could make it more feasible to provide water to an offstream storage reservoir in the Sacramento Valley, such as Sites Reservoir, which would be located approximately 10 miles west of Maxwell, California. Construction of a new reservoir would increase the amount of water available for future use. At this point, it is unclear exactly how water in an offstream storage reservoir would be used; however, it is possible that it may be used for domestic or industrial purposes. Additional water available for domestic use would likely increase settlement and development in the Sacramento Valley. The Sacramento Valley is already experiencing high percentages of population increase, and because of that, agricultural land is being converted. Therefore, potential increase in settlement in the Sacramento Valley could have adverse impacts to the agricultural industry.

4.3 Irreversible and Irretrievable Commitments of Resources and Significant Impacts that Would Remain Unavoidable Even After Mitigation

Irreversible and irretrievable impacts are those that cause consumption of resources that cannot be restored or returned to original condition despite mitigation efforts.

Alternatives that would require construction of the fish screen and conveyance facilities, bypass channel, and fish ladders would result in use of construction materials that could not be restored (e.g., metal materials; excavation and/or importing of soils and rocks; and energy used to manufacture, transport, or construct the facilities), as well as the use of non-renewable resources (e.g., fuel) to operate construction equipment.

Those impacts that are found to be significant and unavoidable would require TCCA to prepare a Statement of Overriding Considerations per state *CEQA Guidelines* Section 15093. The following impacts are identified as potentially significant and unavoidable:

~~Fishery Resources. Construction related impacts that could affect incubating embryos and adult and juvenile fish in the work area would be caused by pile driving activities, earth movement and sheet pile installation, dewatering activities, and sediment disturbances and turbidity.~~

~~Biological Resources. Up to 7.74 acres of riparian habitat would be removed for construction of the access bridge, conveyance pipeline, left fish ladder, and the fish screen and forebay. At least 0.05 acre of freshwater marsh habitat would be permanently lost with construction of the conveyance pipeline and access bridge. Up to 9 elderberry shrubs and three osprey nests would be removed as part of the proposed project.~~

Recreation. Construction of the bypass channel would result in loss of restored riparian woodlands for recreation and education/interpretive uses, and up to 10 camping spaces at the Sycamore Grove Campground. The reduced-gates and gates-out alternatives would result in a reduction in the amount of use, or complete elimination of, Lake Red Bluff. This would significantly reduce or eliminate several in-lake activities such as motor boating, jet skiing, swimming, water skiing, and boat racing.

~~Power. If a new pump station receives CVP-generated electricity (Project Use), it would result in a slight decrease in the amount of electricity available to preference power customers. Regardless of the ultimate source of electricity, any of the action alternatives would add to the overall electrical demand in California.~~

Socioeconomic. The loss of Lake Red Bluff by removal of the gates would result in a significant economic impact to the local community. The combined impact from reduced recreation and tourism spending and from the loss of the Nitro National drag boat races is estimated to be about $4.2 million per year. Value of property located adjacent to the lake or with easy access to the lake could decline because of loss of the lake. Although difficult to quantify, the loss of Lake Red Bluff would result in a noticeable impact to local residents in a number of social

aspects such as a reduction in the quality of life and reduced community cohesion.

Aesthetics. The existing visual character and quality of the project vicinity would be permanently lost under all alternatives. In addition, the bypass channel would create a visual barrier from one location of the recreation area to another. This would substantially degrade the existing visual character of the Recreation Area.

Land Use. Several camping facilities at the Sycamore Grove Campground would be removed for construction of the bypass channel. The use of public and private boat docks and ramps located on the Sacramento River would be permanently lost because of complete RBDD gates removal.

4.4 Short-term Uses of the Environment Versus Long-term Productivity

Short-term impacts are primarily related to construction activities and were identified in the impact assessment (e.g., construction-related impacts to fish). Specific resources that could be affected during implementation of many of the alternatives include fishery resources, biological resources, recreational opportunities, socioeconomics, power production and energy, aesthetics, and land use.

The proposed action does not detract from long-term environmental productivity. Rather, the action improves long-term conservation of fishery resources, enhancing the net productivity of the Sacramento River natural environment, and improves the long-term reliability of agricultural water deliveries. In turn, the action would reduce long-term productivity of the human environment with respect to socioeconomics associated with recreational activity.

4.5 Indian Trust Assets

U.S. Department of the Interior policy (Secretary of the Interior Order 3175) requires that actions under NEPA consider potential effects on Indian trust assets (ITA). It is USBR policy to carry out activities in a manner that protects ITAs and avoids adverse impacts when possible. ITAs are legal interest in property held in trust by the federal government for the benefit of Indian tribes or individuals. Examples of trust assets include lands, minerals rights, hunting and fishing rights, and water rights.

The nearest known ITA is 27 miles east of the project area. Two public domain allotments, one 80 acres and the other 4.5 acres, located along Mill Creek are the closest ITAs within the project area. These public domain allotments would not be affected by the proposed project. No

other ITAs were identified within the proposed project area; therefore, there would be no impacts.

4.6 Environmental Commitments and Mitigation and Significant Unavoidable Impacts

A preliminary determination of impacts and mitigation is presented in Table 4.6-1.

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Fishery Resources			
Native Anadromous Salmonids, Other Native Anadromous Fish, Non-native Anadromous Fish, Resident Native and Non-native Fish			
1A: 4-month Improved Ladder	Construction: Direct and indirect losses of adult and/or juvenile fish would occur during the installation of cofferdams. Adult and juvenile fish may be stranded and lost during dewatering activities. Direct losses and adverse indirect effects would occur from sediment disturbances and turbidity.	Construction: To avoid impacts to the majority of the focus species, sheet pile installation and in-stream heavy equipment activity should occur only during July and August. Dewatered areas would be pumped down with a screened intake. Fish would be removed when water levels within the contained area are suitable for salvage.	Less than significant
1B: 4-month Bypass	Construction: Identical to 4-month Improved Ladder Alternative.	Construction: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Construction: Identical to 4-month Improved Ladder Alternative.	Construction: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Construction: Identical to 4-month Improved Ladder Alternative.	Construction: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Construction: Identical to 4-month Improved Ladder Alternative.	Construction: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Water Resources			
Surface-water Hydrology and Management – No negative impacts were identified.			
Surface Water Quality			
1A: 4-month Improved Ladder	Erosion: Construction of the proposed facilities would require extensive grading and excavation. Impacts to surface waters could occur during grading and excavation necessary for construction of the proposed fish ladders, as well as the proposed pumping plant and associated conveyance facilities.	Erosion: To reduce the potential for sedimentation in the Sacramento River or Red Bank Creek to a less than significant level: • Construction contractor shall obtain a General Construction Storm Water Permit, to comply with Clean Water Act Section 402(b) for construction of all facilities. As part of this permit, the contractor shall prepare a Stormwater Pollution Prevention Plan, which would include the following Best Management Practices: – All ground-disturbing activities would be limited to the dry season (mid-May through mid-October) to the extent possible – Vegetation would be left in place to the degree possible to reduce potential sedimentation – All stockpiled material would be placed so that potential erosion is minimized – Filter fabric, straw bales, and/or sediment basins would be used to reduce erosion and the potential for in-stream sedimentation	Less than significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		– Seeding and re-vegetation would be initiated as soon as possible (timed properly to coincide with fall/winter precipitation) after construction completion	
1A: 4-month Improved Ladder	Hazardous Materials: Construction efforts would include use of materials and equipment that require hazardous materials. Examples include diesel fuel and cleaning solvents. Although not intentional, it is possible that the use and handling of hazardous materials could result in spills that could impact nearby waterways.	Hazardous Materials: Implementation of construction Best Management Practices and development of a Spill Prevention Control and Countermeasures would minimize the risk of an uncontrolled spill and consequent contamination. The identification of staging areas for fueling and maintenance of heavy equipment would limit potential spills to designated areas where observation and cleanup could be readily accomplished. Should an oil or fuel spill occur during construction or maintenance activities, all work would cease immediately, the Central Valley RWQCB, CDFG, and USBR would be notified immediately if the quantity of the spill were above state and/or federal reporting requirements; and cleanup procedures would begin immediately.	Less than significant
1B: 4-month Bypass	Erosion and Hazardous Materials: Identical to 4-month Improved Ladder Alternative.	Erosion and Hazardous Materials: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Erosion and Hazardous Materials: Identical to 4-month Improved Ladder Alternative.	Erosion and Hazardous Materials: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Erosion and Hazardous Materials: Identical to 4-month Improved Ladder Alternative	Erosion and Hazardous Materials: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Erosion and Hazardous Materials: Identical to 4-month Improved Ladder Alternative.	Erosion and Hazardous Materials: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Groundwater Quality			
1A: 4-month Improved Ladder	Contaminants: Soil contamination at the Pactiv site represents potential impacts to local groundwater resources if contaminated soil is allowed to come in contact with groundwater as a result of project construction activities. Additionally, leaching of soluble or mobile contaminants from soil to groundwater may occur over time if contaminated soil is stockpiled onsite for a long period of time or relocated to a disposal area onsite, through infiltration and other transport processes.	Contaminants: In the event that contaminated soil is encountered, the contractor shall follow and comply with all applicable federal, state, and local regulations. Soil should be removed immediately from the project area, and taken to an appropriate disposal area. If soil should be temporarily stockpiled in the project area, an impermeable liner should be used to prevent direct contact with non-contaminated areas. The following mitigation measures would reduce the potential for contamination in groundwater in the proposed project area to a less than significant level: • Construction contractor shall obtain a General Construction Storm Water Permit, to comply with Clean Water Act Section 402(b) for construction of all facilities. As part of this permit, the contractor shall prepare a Stormwater Pollution Prevention Plan, which would include the following Best Management Practices:	Less than significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		– All ground-disturbing activities would be limited to the dry season (mid-May through mid-October) to the extent possible – All stockpiled material would be placed so that potential erosion and contamination is minimized. Methods shall include, but not be limited to: – Covering the stockpile with plastic sheeting or tarps – Installing a berm around the stockpile to prevent runoff from leaving the area – Planting temporary vegetation if stockpiled material would be kept onsite for a longer duration	
1B: 4-month Bypass	Contaminants: Identical to 4-month Improved Ladder Alternative.	Contaminants: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Contaminants: Identical to 4-month Improved Ladder Alternative.	Contaminants: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Groundwater Quality: The reduced-gates alternative would result in a reduction in the amount of time Lake Red Bluff would be formed. This would ultimately change seasonal elevations of ground-water in the project area. There is some potential that additional wells may exist in the vicinity of Lake Red Bluff that have not been identified during the development of this EIR. Wells that depend on the additional groundwater recharge and head provided by Lake Red Bluff could require alternate water supplies if the gates remain out during the dry season. However, because the gates are currently out most of the year, wells in the aquifer areas influenced by the filling of Lake Red Bluff are probably already designed to supply water regardless of gate position.	Groundwater Quality: If it is determined that wells in the project area are affected by the seasonal fluctuation of Lake Red Bluff, these wells could be relocated or extended to greater depths to meet continuous or seasonal water demands.	Less than significant
2B: 2-month with Existing Ladders	Contaminants: Identical to 4-month Improved Ladder Alternative.	Contaminants: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Groundwater Quality: Identical to 2-month Improved Ladder Alternative.	Groundwater Quality: Mitigation identical to 2-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Contaminants: Identical to 4-month Improved Ladder Alternative.	Contaminants: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
3: Gates-out	Groundwater Quality: Identical to 2-month Improved Ladder Alternative.	Groundwater Quality: Mitigation identical to 2-month Improved Ladder Alternative.	Less than significant
	Biological Resources		
Wildlife Habitat			
1A: 4-month Improved Ladder	Riparian Habitat: Up to 7.74 acres of riparian habitat would be impacted, including the permanent loss of 2.18 acres for the access bridge, the conveyance pipeline, left fish ladder, and the fish screen and forebay. An additional 5.56 acres of riparian habitat could be removed for construction activities for the forebay/conveyance and left fish ladder.	Riparian Habitat: To the extent possible, areas of riparian vegetation temporarily disturbed during construction would be planted with native riparian trees and shrubs following construction. The permanent removal of riparian vegetation would be mitigated by creating riparian habitat at 3:1 ratio for the impacted acreage. TCCA and USBR would work with CDFG and USFWS to identify sites.	Less than significant
1A: 4-month Improved Ladder	Freshwater Marsh Habitat: At least 0.05 acre of freshwater marsh habitat would be permanently lost with construction of the conveyance pipeline and access bridge. An additional 0.71 acre of freshwater marsh are within the 200-foot construction area and could be impacted, for a total of 0.76 acre.	Freshwater Marsh Habitat: To the extent possible, areas of freshwater marsh temporarily disturbed during construction would be planted with native riparian trees and shrubs following construction. The permanent removal of freshwater marsh would be mitigated by creating freshwater marsh at a 3:1 ratio for the impacted acreage. TCCA and USBR would work with CDFG and USFWS to identify appropriate sites.	Less than significant
Special-status Species			
1A: 4-month Improved Ladder	VELB: VELB are entirely dependent on the elderberry shrub. The six elderberry shrubs and/or groups of shrubs identified in the project area are within the 200-foot buffer area considered to be temporarily impacted in this analysis. Removal of the elderberry shrubs under this alternative has the potential to adversely affect the federal-listed VELB.	VELB: TCCA and USBR would attempt to avoid elderberry shrubs in locating staging areas, access roads, and other construction areas. Shrubs that can be avoided would be fenced and posted, and workers would be educated about VELB in accordance with the Conservation Guidelines. If elderberry shrubs cannot be avoided, they would be transplanted, and additional seedlings would be planted at a secure mitigation site in accordance with the Conservation Guidelines. Section 7 consultation with the USFWS has been concluded with the issuance of a Biological Opinion.	Less than significant
Other Special-status Species			
1A: 4-month Improved Ladder	Osprey: The three osprey nest platforms on the south side of the Sacramento River would need to be removed during construction.	Osprey: Prior to the start of construction activities, all three ~~the two~~ platforms that can support~~ing~~ osprey nesting would be removed. TCCA and USBR would work with CDFG to identify nearby location(s) to erect two platforms to serve as replacement nesting sites. The relocated platforms would be installed concurrently with the removal of the existing platforms and be completed prior to the start of the nesting season.	Less than significant
	Bats: Three bat species were visually confirmed, and a fourth species was acoustically detected in the project vicinity. Numerous roost locations were documented in the two abandoned storage buildings at the Mill Site. Evidence was found that bats roost in	Bats: Exclusion and Building Removal: If the current project plans are modified and the buildings were to be demolished, impacts would be considered to be permanent and significant. Removal of the abandoned buildings would displace hundreds and possibly thousands of bats and be a significant	

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	some of the hydroelectric structures of RBDD in concrete weep holes and under metal overhangs. Several areas appeared to provide potential roosting and foraging habitat. The two abandoned buildings used as bat roosts are within the 200-foot buffer area. There are no plans to remove these buildings. No significant impacts to bats would occur. If at the time of project construction a decision is made to permanently impact the roosting habitat by removing the buildings, bats would be significantly impacted, and appropriate mitigation for exclusion of bats from the habitat would be prescribed. For detailed mitigation measures refer to Appendix F. To further ensure that there would be no significant impact, a 25-foot buffer area would be demarcated and flagged around the buildings. No construction activities would occur within this area. Construction materials would not be stored in the buildings occupied by bats, nor would workers enter the buildings. If these avoidance measures are not possible, TCCA would work with CDFG to coordinate an appropriate avoidance measure.	loss of roosting habitat. The species currently identified are colonial, and displacement from the roosts may disrupt colony cohesion. Displaced bats may roost in exposed locations and be at increased risk of predation. If the buildings are to be removed, prior mitigation in the form of exclusion would be performed. Exclusion consists of two phases: allowing emergence while temporarily blocking re-entry for 1 week, followed by permanently blocking the roost entrances. Surveys must be conducted to ensure that all bats have exited the roost before the entrances are permanently blocked to avoid direct mortality by entombment. It is vital that exclusion only be performed in the winter (November through February) after any young of the year are mature. A qualified nuisance control professional should perform the exclusion. A qualified biologist should monitor the bats during the procedures to prevent any mortalities from bats becoming entangled in the netting, and to conduct surveys to ensure that bats are successfully excluded. With these mitigation measures, impacts to bats would be less than significant. Provision of Alternate Roosting Habitat: To mitigate for the loss of roosting habitat, provision of alternate roosting habitat in the form of offsite installation of large bat houses is recommended. Large bat houses (bat condos) may be erected. Bat condos are similar to raised wooden chicken coops with internal partitions to form roost crevices. The overall size should be 8 x 8 x 8 feet, and the width of the internal partitions should be approximately 0.75 to 1.0 inch for the free-tail bats and also 1.0 to 1.5 inches for the pallid bats. Bat condos should be oriented properly (usually southern or southeastern exposure), and the temperature regime and humidity inside the condo should replicate that found in the original roosts. It is recommended that the existing exterior wall of the abandoned storage building located at the Mill Site with the plywood-backed louvers be reconstructed in a suitable offsite location to provide for myotis bat roosting habitat. Alternately, bat houses mounted on poles may be erected that simulate the existing roost (the gap under the loose board attached to a pole). Managers at the Recreation Area are currently experimenting with bat house style and placement and may provide a cooperative bat management opportunity. With these mitigation measures, impacts to bats would be less than significant.	

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Wildlife Habitat			
1B: 4-month Bypass	Riparian Habitat: Approximately 8.9 acres of riparian habitat would be permanently or temporarily removed. This includes the permanent loss of 2.6 acres of riparian habitat with land conversion resulting from installation of the bypass, access bride, conveyance pipeline, and the fish screen and forebay. Up to an additional 6.3 acres of riparian habitat could be removed to accommodate construction activities required for the bypass work area and the forebay/conveyance and right fish ladder work areas. These impacts would constitute a temporary impact. Following completion of construction, temporarily impacted areas of riparian habitat would be planted with native riparian tress and shrubs to restore the habitat.	Riparian Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
1B: 4-month Bypass	Freshwater Marsh Habitat: Identical to 4-month Improved Ladder Alternative.	Freshwater Marsh Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
1B: 4-month Bypass	Restored Habitat: Under this alternative, 9.76 acres of restored habitat would be impacted. Because the restored habitat was created as mitigation for removal of riparian habitat and/or oak woodland elsewhere, its removal would result in inadequate mitigation for the previous impact. Therefore, removal of restored habitat under this alternative is a significant impact.	Restored Habitat: To the extent possible, restored habitat disturbed during construction would be planted with similar trees and shrubs to restore the impacted habitat following construction. The permanent removal of restored habitat would be mitigated by creating restored habitat at a 3:1 ratio for the impacted acreage. TCCA and USBR would work with CDFG and USFWS to identify appropriate locations for restored habitat. With this mitigation, the impacts to restored habitat would be less than significant.	Less than significant
Special-status Species			
1B: 4-month Bypass	VELB: Identical to 4-month Improved Ladder Alternative.	VELB: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Other Special-status Species			
1B: 4-month Bypass	Osprey and Bats: Identical to 4-month Improved Ladder Alternative.	Osprey and Bats: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Wildlife Habitat			
2A: 2-month Improved Ladder	Riparian Habitat: Up to 7.74 acres of riparian habitat would be impacted, including the permanent loss of 2.18 acres for the access bridge, the conveyance pipeline, left fish ladder, and the fish screen and forebay. An additional 5.56 acres of riparian habitat could be removed for construction activities for the forebay/conveyance and left fish ladder.	Riparian Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Freshwater Marsh Habitat: Identical to 4-month Improved Ladder Alternative.	Freshwater Marsh Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Special-status Species			
2A: 2-month Improved Ladder	VELB: Identical to 4-month Improved Ladder Alternative.	VELB: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Other Special-status Species			
2A: 2-month Improved Ladder	Osprey and Bats: Identical to 4-month Improved Ladder Alternative.	Osprey and Bats: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Wildlife Habitat			
2B: 2-month with Existing Ladders	Riparian Habitat: Up to 6.81 acres of riparian habitat would be impacted, including the permanent loss of 2.05 acres of riparian habitat for installation of the access bridge, the conveyance pipeline, and the fish screen and forebay, all on the south side of the river. Up to an additional 4.76 acres of riparian habitat could be temporarily removed to accommodate construction activities.	Riparian Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Freshwater Marsh Habitat: Identical to 4-month Improved Ladder Alternative.	Freshwater Marsh Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Special-status Species			
2B: 2-month with Existing Ladders	VELB: Identical to 4-month Improved Ladder Alternative	VELB: Mitigation identical to 4-month Improved Ladder Alternative.	
Other Special-status Species			
2B: 2-month with Existing Ladders	Osprey and Bats: Identical to 4-month Improved Ladder Alternative.	Osprey and Bats: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Wildlife Habitat			
3: Gates-out	Riparian Habitat: Identical to 2-month with Existing Ladders Alternative.	Riparian Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
3: Gates-out	Freshwater Marsh Habitat: Identical to 4-month Improved Ladder Alternative.	Freshwater Marsh Habitat: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Special-status Species			
3: Gates-out	VELB: Identical to 2-month with Existing Ladders Alternative.	VELB: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Other Special-status Species			
3: Gates-out	Osprey and Bats: Identical to 4-month Improved Ladder Alternative.	Osprey and Bats: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
		Recreation	
1B: 4-month Bypass	New Pump Station, Right Bank Fish Ladder, Conveyance Facility, and Bypass Channel: Temporary construction-related impacts associated with the 4-month Bypass Alternative include all impacts identified for the 4-month Improved Ladder Alternative and those noted below. Temporary impacts from construction of the bypass channel include: • Extensive excavation and earthmoving equipment within the Recreation Area. • Limited access to the Discovery Center/Charter School. • Limited access to the USFS/Sycamore Grove Campground. • The relocation of Sale Lane and the USFS/Sycamore Grove Campground Road. • Removal of approximately 10 camping spaces at the Sycamore Grove Campground. • Construction-related traffic increase on Sale Lane. • Construction of an access bridge over the bypass channel. • Construction of security fencing around the bypass channel.	New Pump Station, Right Bank Fish Ladder, Conveyance Facility, and Bypass Channel: Mitigation options to address the temporary construction-related impacts include: • Use the latest construction techniques to minimize impacts (i.e., noise blankets for pile-driving operations). • Conduct an ongoing public information campaign targeted at area recreation users. This campaign would provide information on construction activities/impacts as well as information on temporary alternate recreation sites. • Maintain temporary access for vehicles, pedestrians, and cyclists to all Recreation Area facilities throughout construction. • Maintain the existing access to the Discovery Center with the construction of a bridge. • Create a new alignment of Sale Lane to access the boat ramp south of RBDD. • Design security fencing in conjunction with USFS to be minimally intrusive in size, location, color, and materials. Alternative security measures would be investigated, such as use of rock walls or other natural materials to address safety issues around the bypass channel. • Develop 10 new campsites and all supporting infrastructure (roads/trails and utilities) at an alternate location to offset those lost during construction.	Significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
1B: 4-month Bypass	Mill Site Pumping Station and Bypass Channel: The Recreation Area would be directly impacted by the alignment of the bypass channel bisecting a portion of the property. The construction and operations of the bypass channel would result in the following: • Loss of restored riparian woodlands for recreation and educational/interpretative uses in the Recreation Area. • Creation of a physical barrier between the Sacramento River Discovery Center/Charter School, Sycamore Grove Campground, and the remainder of the Recreation Area. • Loss of 10 camping spaces at Sycamore Grove Campground. • Construction of security fencing around the bypass channel impacting the experience of visitors to the Recreation Area. • Limiting pedestrian and cycling access between the portions of the Recreation Area separated by the bypass channel to two crossings–one adjacent to a new bridge on Sale Lane crossing the channel and the second a footbridge east of the current Sycamore Grove campsites. The associated loss of riparian woodlands for educational/interpretive uses is in conflict with the Lake Red Bluff FEIS. The Lake Red Bluff FEIS stresses the importance of recreational uses in concert with the restoration of riparian habitat and public education of the area's natural environment.	Mill Site Pumping Station and Bypass Channel: Mitigation options to address the permanent operations-related impacts include: • Provide permanent access for vehicles, pedestrians, and cyclists to all Recreation Area facilities with an access bridge and pedestrian/cyclist bridge. • Incorporate extensive natural landscaping into the final construction of the bypass channel to blend the new construction with the surrounding riparian area. • Maintain the existing access to the Discovery Center with the construction of a bridge. • Create a new alignment of Sale Lane to access the boat ramp south of RBDD. • Design security fencing in conjunction with USFS to be minimally intrusive in size, location, color, and materials. Alternative security measures would be investigated, such as use of rock walls or other natural materials to address safety issues around the bypass channel. • Develop 10 new campsites at an alternate location to offset those lost during construction. • Use the bypass channel as an educational/interpretive element of the Recreation Area. This may include the development of fish-viewing locations along the bypass channel.	Significant
2A: 2-month Improved Ladder	Adjusted Gates-in Period: Recreational activities that would experience limitations associated with the loss of Lake Red Bluff for 2 additional months include: • Motor boating • Jet skiing • Swimming • Water skiing • Boat racing	Adjusted Gates-in Period: Mitigation options to address the permanent operations-related impacts include: • Facilitate the development and implementation of a plan with the City of Red Bluff, Tehama County, local business organizations, appropriate permitting agencies, and local citizens groups to phase in the gate operations changes over a period of 5 years to:	Significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	While recreational motor boating and jet skiing are possible on the Sacramento River during the gates-out period, the available water area is considerably reduced for the 2 additional gates-out months. Therefore, less time is available for these activities. Swimming is possible, but unlikely in the cold Sacramento River water. Boat racing and water skiing are not feasible during the additional 2-month gates-out period. The activities are lake- dependent activities and would assume the greatest impact. The Nitro National drag boat races could not be held over the Memorial Day holiday weekend.	– Allow the community to transition lake-dependent recreation activities to other opportunities. – Identify specific activities and events through the facilitated planning process with local stakeholders. • Facilitate the development of non-lake dependent recreational activities as part of the planning process mentioned above. This may include, but is not limited to: – Cooperating on the implementation of recreational trail plans. – Cooperating on the rehabilitation and expansion of existing area recreational parkland or facilities. – Facilitating identification and acquisition of future recreational parkland. • Facilitate the creation of other recreation-oriented events as part of the planning process mentioned above. This may include, but is not limited to: – Facilitating the rescheduling of the Nitro National Drag Boat Festival. – Facilitating the development of a land- or river-based festival event (river sports, and fishing) of similar size/impact as the Nitro National Drag Boat Festival.	
2B: 2-month with Existing Ladders	Adjusted Gates-in Period: Identical to 2-month Improved Ladder Alternative.	Adjusted Gates-in Period: Mitigation identical to 2-month Improved Ladder Alternative.	Significant
3: Gates-out	Gates-out Year-round: Recreational activities would experience limitations or elimination as a result of the loss of Lake Red Bluff, including: **Limited:** • Swimming • Jet skiing • Motor boating **Eliminated:** • Water skiing • Boat racing The Nitro National drag boat races, traditionally held on Lake Red Bluff over the Memorial Day holiday weekend, would not be viable at its current location.	Gates-out Year-round: Mitigation identical to 2-month Improved Ladder Alternative (Adjusted Gates-in Period).	Significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	The drag boat race would either move to another location or be replaced with another race in another location. Many stakeholders have expressed the importance of this high-profile event as a critical recreational opportunity in Red Bluff. The activities listed are characterized as lake-dependent activities and would assume the greatest impact as a result of this alternative.		
		Land Use	
1B: 4-month Bypass	Sycamore Grove Campground: Temporary and permanent construction-related impacts would also occur to the use of the Sycamore Grove Campground facilities located in the Recreation Area. Construction vehicles would need access to the campground area to construct the lower end of the channel. Approximately 10 camping facilities would be ~~permanently~~ removed as a result of construction of the bypass channel. A new road would need to be constructed to maintain access to the remaining camping facilities.	~~Sycamore Grove Campground: No mitigation is available.~~ Although the loss of 10 campsites from Sycamore Campground is unavoidable, construction of replacement campsites (Mitigation 1B-R1), including supporting infrastructure, would mitigate the impact.	Significant
1B: 4-month Bypass	Discovery Center: Temporary impacts would occur as a result of construction to the use of the Discovery Center. Schools from the area make daily trips to the center during the spring months. If construction of the bypass channel were to occur during the springtime, access to the valley oak, western red bud, California native sycamore, and Fremont cottonwood plantings would be blocked. This would conflict with the riparian and oak lessons and hikes that occur with the daily trips.	Discovery Center: No mitigation is available.	Significant
1B: 4-month Bypass	Recreation Area: Construction of the bypass channel does not comply with the current management direction in the Mendocino National Forest Land and Resource Management Plan.	Recreation Area: Amendment of the Mendocino National Forest Land and Resource Management Plan under the~~is~~ alternative would eliminate conflict with current ~~reconcile~~ management direction in the Mendocino National Forest Land and Resource Management Plan ~~with the new situation, but would not avoid the impacts~~.	Significant
2A: 2-month Improved Ladder	Boat Docks and Ramps: Permanent impacts would occur to the use of public and private boat docks and ramps located on Sacramento River. Public and private boat docks and ramps currently existing along the shoreline of the river would not properly	Boat Docks and Ramps: No mitigation is available.	Significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	function when the gates are in the up position; therefore, they would be unusable for 2 additional months.		
2B: 2-month with Existing Ladders	Boat Docks and Ramps: Identical to 2-month Improved Ladder Alternative.	Boat Docks and Ramps: No mitigation is available.	Significant
3: Gates-out	Boat Docks and Ramps: Permanent impacts would occur to the use of public and private boat docks and ramps located on Sacramento River. Public and private boat docks and ramps currently existing along the shoreline of the river would not properly function when the gates are in the up position. These boat docks and ramps would no longer access the lower elevations of the river in its natural, free-flowing state.	Boat Docks and Ramps: No mitigation is available.	Significant
		Geology	
1A: 4-month Improved Ladder	Excavation: Approximately 800,000 CY of material would need to be excavated. Approximately 600,000 CY of this material would be stored onsite.	Excavation: To minimize soil erosion, movement of sediments, loss of topsoil, and associated water quality impacts, an approved drainage, grading, and erosion control plan would be completed prior to construction. This plan would meet all local requirements and incorporate construction site Best Management Practices to stabilize areas cleared of vegetation and soil stockpiles. Best Management Practices may include preservation of existing vegetation, silt fences, and/or straw bales. Covering soil stockpiles with mulch or matting as well as continuous maintenance of erosion control measures would be necessary. Timely re-vegetation of disturbed sites would minimize post-construction erosion impacts.	Less than significant
1B: 4-month Bypass	Excavation: Identical to 4-month Improved Ladder Alternative.	Excavation: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Excavation: Identical to 4-month Improved Ladder Alternative.	Excavation: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Excavation: Approximately 750,000 CY of material would need to be excavated to complete construction of this alternative. The primary excavation for this alternative is required to construct the Mil Site pump station and conveyance facilities. Approximately 580,000 CY of this material would remain onsite.	Excavation: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Excavation: Identical to 4-month Improved Ladder Alternative.	Excavation: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Agricultural Resources – *No negative impacts were identified.*			
Power Resources – *No significant impacts were identified.*			
Socioeconomic			
3: Gates-out	Fish Runs/Spending/Property Value/Quality of Life and Community Cohesion: Although there have been gradual reductions in the amount of time the lake has been available each year, the total loss of Lake Red Bluff would have much more dramatic effects on the local economy than those in recent history. The sum total of the various impacts of this alternative would result in a significant economic impact to the local community. The potential for positive economic impact is uncertain and should be viewed as speculative at this stage of analysis. The combined impact from reduced recreation and tourism spending and from the loss of the Nitro National drag boat races is estimated to be about $4.2 million per year. This is small relative to total annual sales in Tehama County of $1.7 billion, but it would be a more substantial impact to the City of Red Bluff. One measure of this impact is the resulting loss of sales and use tax revenue of $89,000, which is about 1.9 percent of the City's total revenues from sales and use taxes. It is likely that the value of properties adjacent to the lake or with easy access to the lake would decline from the loss of the lake. While it is uncertain how large this impact would be, it is expected that, in general, the impact would be in the low end of national estimates of the value of lake views and proximity of 4 to 18 percent. This alternative would also result in a noticeable impact to local residents in a number of social aspects such a reduction in the quality of life and reduced community cohesion. Even though these impacts are hard to quantify, they are nonetheless real impacts to the local community.	Fish Runs/Spending/Property Value/Quality of Life and Community Cohesion: No mitigation is available.	Significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		Cultural Resources	
1A: 4-month Improved Ladder	Unidentified Cultural Resources: Construction activities include excavation and other grading and digging activities. It is possible that currently unidentified cultural resources could be discovered during these activities, and destruction of such resources could result in a significant impact.	Unidentified Cultural Resources: If during construction activities, ~~unusual~~ amounts of non-native stone, bone, shell, or prehistoric or historic period artifacts are discovered, or if areas that contain dark-colored sediment that do not appear to have been created through natural processes are discovered, then work would cease in the immediate area of discovery, and USBR's Contract Inspector and the USBR Regional Archaeologist ~~a professionally qualified archeologist~~ would be contacted immediately for an onsite inspection of the discovery. USBR would consult with the State Historic Preservation Officer pursuant to 36 CFR 800.13 to evaluate the find, assess the project's effects on the find, and resolve any potential adverse effects. ~~If any bone is uncovered that appears to be human, the Tehama County Coroner would be contacted. If the coroner determines the bone most likely represents a Native American interment, the coroner would contact the Native American Heritage Commission in Sacramento for identification of the most likely descendants. Implementation of this mitigation would reduce potentially significant impacts to a less than significant level.~~ If any bone is uncovered from private land that appears to be human, the Tehama County coroner would be contacted, according to state law. If the coroner determines that the bone most likely represents a Native American interment, the coroner would contact the Native American Heritage Commission for identification of the most likely descendants. In the event that human remains or cultural items are discovered on USBR lands, then all work should cease in the vicinity of the discovery, and the requirements of the Native American Graves Protection and Repatriation Act and Reclamation Directives and Standards LND 07-01 shall be implemented and followed.	Less than significant
1B: 4-month Bypass	Unidentified Cultural Resources: Identical to 4-month Improved Ladder Alternative.	Unidentified Cultural Resources: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Unidentified Cultural Resources: Identical to 4-month Improved Ladder Alternative.	Unidentified Cultural Resources: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Unidentified Cultural Resources: Identical to 4-month Improved Ladder Alternative.	Unidentified Cultural Resources: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Unidentified Cultural Resources: Identical to 4-month Improved Ladder Alternative.	Unidentified Cultural Resources: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	Aesthetics		
1A: 4-month Improved Ladder	Construction Views of Mill Site: Construction of all facilities would take roughly 3 years to complete. During the construction period, viewers would experience substantially degraded sites, although some construction activity may be screened from sight by cofferdams.	Construction Views of Mill Site: No mitigation is available.	Significant
1A: 4-month Improved Ladder	Permanent Landscape Changes from Operations: Represents a substantial change to the landscape as viewed from the Sacramento River and the Recreation Area. Given the size of the new structure and the sensitivity of the viewing location, operation of these facilities represents a substantial degradation of the visual quality of the site.	Permanent Landscape Changes from Operations: To help mitigate visual impacts, a committee would be formed following selection of a Preferred Alternative to develop measures intended to help the new facility blend with the surrounding environment. Potential measures include selection of a concrete color and a finish for the fish screen panels (if available). The committee to evaluate visual resources mitigation measures would be based on the existing Stakeholder Working Group.	Significant
1B: 4-month Bypass	Construction Views of Mill Site: Identical to 4-month Improved Ladder Alternative.	Construction Views of Mill Site: No mitigation is available.	Significant
1B: 4-month Bypass	Construction View of Bypass Channel: Construction of the bypass channel would take roughly 12 months to complete. During the construction period, viewers would experience substantially degraded views, including views of tree and other vegetation removal, channel trenching, temporary spoils piles, large construction equipment, concrete work, rock and gravel placement, and fence installation. Because of the sensitivity of the construction area and the number of recreational viewers in the immediate vicinity of construction, construction of the bypass pipeline would substantially degrade the visual character and quality of the site and its surroundings.	Construction Views of Bypass Channel: No mitigation is available.	Significant
1B: 4-month Bypass	Permanent Landscape Changes from Operations: Identical to 4-month Improved Ladder Alternative.	Permanent Landscape Changes from Operations: Mitigation identical to 4-month Improved Ladder Alternative.	Significant
1B: 4-month Bypass	Permanent Landscape Changes from Bypass Channel: The bypass channel would represent a substantial change to the landscape as viewed from the Sacramento River and throughout the Recreation Area.	Permanent Landscape Changes from Bypass Channel: To help mitigate visual impacts, a committee would be formed following selection of a Preferred Alternative to develop measures intended to help the bypass channel blend with the surrounding environment. Potential measures include selection of fencing material and landscaping around the channel.	Significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	Regardless of the location from which the bypass channel is viewed, it represents a significant visual intrusion in the midst of a landscape that receives heavy recreational use. Because it crosses the Recreation Area, it effectively creates a visual barrier from one location of the Recreation Area to another. This visual barrier represents a substantial degradation of the existing visual character of the Recreation Area.	The committee to evaluate visual resources mitigation measures would be based on the existing Stakeholder Working Group.	
2A: 2-month Improved Ladder	Construction Views of Mill Site: Identical to 4-month Improved Ladder Alternative.	Construction Views of Mill Site: No mitigation is available.	Significant
2A: 2-month Improved Ladder	Permanent Landscape Changes from Operations: Identical to 4-month Improved Ladder Alternative.	Permanent Landscape Changes from Operations: Mitigation identical to 4-month Improved Ladder Alternative.	Significant
2A: 2-month Improved Ladder	Permanent Landscape Changes from Reduction of Gates-in Period: Under the 2-month Improved Ladder Alternative, the RBDD gates would remain in the up position for an additional 2 months, reducing the gates-in period from 4 months each year to 2 months each year. Because the quality of some of the views within the Middle River reach are considered moderate under the gates-out condition and moderately high under the gates-in condition, an increase in the gates-out condition may be considered to be a substantial degradation of the visual quality of the Middle River reach.	Permanent Landscape Changes from Reduction of Gates-in Period: No mitigation is available.	Significant
2B: 2-month with Existing Ladders	Construction Views of Mill Site: Identical to 4-month Improved Ladder Alternative.	Construction Views of Mill Site: No mitigation is available.	Significant
2B: 2-month with Existing Ladders	Permanent Landscape Changes from Operations: Identical to 4-month Improved Ladder Alternative.	Permanent Landscape Changes from Operations: Mitigation is identical to 4-month Improved Ladder Alternative.	Significant
2B: 2-month with Existing Ladders	Permanent Landscape Changes from Reduction in Gates-in Time Period: Visual quality impacts are identical to 2-month Improved Ladder.	Permanent Landscape Changes from Reduction in Gates-in Time Period: No mitigation is available.	Significant
3: Gates-out	Construction Views of Mill Site: Identical to 4-month Improved Ladder Alternative.	Construction Views of Mill Site: No mitigation is available.	Significant
3: Gates-out	Permanent Landscape Changes from Operations: Identical to 4-month Improved Ladder Alternative.	Permanent Landscape Changes from Operations: Mitigation is identical to 4-month Improved Ladder Alternative.	Significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
3: Gates-out	Permanent Landscape Changes from Elimination of Gates-in Period: The impacts to visual resources resulting from the Gates-out Alternative would be the same as those described for the 2-month Improved Ladder Alternative. Because the change from the gates-in to gates-out appearance would be permanent, the ultimate effect of the Gates-out Alternative would be to have negative aesthetic effects on scenic views and to substantially degrade the existing visual character and quality of the project vicinity. This degradation would be particularly evident through the Lower River/Red Bluff Recreation Area, East Sand Slough, and the Middle River reach. Therefore, the impact of eliminating the annual gates-in period would be considered significant.	Permanent Landscape Changes from Elimination of Gates-in Period: To help mitigate visual impacts, a committee would be formed following selection of a Preferred Alternative to develop measures intended to help improve the appearance of those areas through the Sacramento River reaches that are particularly impacted by the loss of Lake Red Bluff. Potential measures include natural vegetation or landscaping through the east bank of the river adjacent to the Recreation Area and the East Sand Slough, and the creation of shallow lagoons or ponds adjacent to the Recreation Area and the City Park. The committee to evaluate visual resources mitigation measures would be based on the existing Stakeholder Working Group.	Significant
		Air Quality	
1A: 4-month Improved Ladder	Fugitive Dust Emissions: During ground surface preparation, most of the PM_{10} emissions would be composed of fugitive dust. Short-term impacts with regard to dust generated during construction would be considered potentially significant because of the current exceedance of the state PM_{10} standards~~.~~ however, when standard fugitive dust mitigation measures are applied, PM_{10} construction impacts would be less than significant.	Fugitive Dust Emissions: A ~~dust control program~~ fugitive dust emissions plan would be implemented in accordance with Tehama County Air Pollution Control District Rule 4:24. It would include ~~with~~ the following components: • Equipment and manual watering would be conducted on all stockpiles, dirt/gravel roads, and exposed or disturbed soil surfaces, as necessary, to reduce airborne dust. • The contractor or builder would designate a person to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. This person would respond to citizen complaints. • Dust-producing activities would be suspended when high winds create construction-induced visible dust plumes moving beyond the site in spite of dust control. • All trucks hauling soil and other loose material would be covered, or would be required to have at least 2 feet of freeboard. • All unpaved access roads and staging areas at construction sites would have soil stabilizers applied as necessary. • Streets in and adjacent to construction area would be kept swept and free of visible soil and debris. • Traffic speeds on all unpaved roads would be limited to 15 miles per hour.	Less than significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
1A: 4-month Improved Ladder	Construction Exhaust Emissions: Fugitive dust impacts are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. PM_{10}, NO_x, and VOC are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. Operations-related impacts are less than significant. ~~Total daily emission levels of 777.82 lb/day of CO and 238.84 lb/day Nox would exceed their respecttive significance thresholds of 550 lb/day and 219 lb/day set in the National Ambient Air Quality Standards.~~	Construction Exhaust Emissions: An equipment control program would be implemented with the following components: • Properly maintain equipment. • Limit idling time when equipment is not in operation.	Less than significant
1B: 4-month Bypass	Fugitive Dust Emissions: Identical to 4-month Improved Ladder Alternative.	Fugitive Dust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
1B: 4-month Bypass	Construction Exhaust Emissions: Fugitive dust impacts are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. PM_{10}, NO_x, and VOC are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. Operations-related impacts are less than significant. ~~Total daily emission levels of 1,147.57 lb/day of CO and 352.45 lb/day Nox would exceed their respective significance thresholds of 550 lb/day and 219 lb/day set in the National Ambient Air Quality Standards.~~	Construction Exhaust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Fugitive Dust Emissions: Identical to 4-month Improved Ladder Alternative.	Fugitive Dust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Construction Exhaust Emissions: Fugitive dust impacts are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. PM_{10}, NO_x, and VOC are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. Operations-related impacts are less than significant. ~~Total daily emission levels of 963.73 lb/day of CO~~	Construction Exhaust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	~~and 295.96 lb/day Nox would exceed their respective. significance thresholds of 550 lb/day and 219 lb/day set in the National Ambient Air Quality Standards.~~		
2B: 2-month with Existing Ladders	Fugitive Dust Emissions: Identical to 4-month Improved Ladder Alternative.	Fugitive Dust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Construction Exhaust Emissions: Fugitive dust impacts are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. PM_{10}, NO_x, and VOC are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. Operations-related impacts are less than significant. ~~Total daily emission levels of 876.11 lb/day of CO and 269.04 lb/day Nox would exceed their respective significance thresholds of 550 lb/day, and 219 lb/day set in the National Ambient Air Quality Standards.~~	Construction Exhaust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Fugitive Dust Emissions: Identical to 4-month Improved Ladder Alternative.	Fugitive Dust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Construction Exhaust Emissions: Fugitive dust impacts are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. PM_{10}, NO_x, and VOC are significant during construction, but after mitigation is applied they are reduced to a level of less than significant. Operations-related impacts are less than significant. ~~Total daily emission levels of 1,491.09 lb/day of CO and 457.99 lb/day Nox would exceed their respective significance thresholds of 550 lb/day and 219 lb/day set in the National Ambient Air Quality Standards.~~	Construction Exhaust Emissions: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
	Traffic and Circulation		
1A: 4-month Improved Ladder	Left and Right Banks: Large construction vehicles could exceed the capacity of Sale Lane and Altube Avenue. Neither roadway is designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.	Left and Right Banks: To reduce construction-related impacts on traffic and roadways, the construction contractor would be required to develop a traffic control plan with the Tehama County Public Works, City of Red Bluff Public Works, and California Department of Transportation, which would be subject to review by California Department of Transportation	Less than significant

TABLE 4.6-1
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		and the Public Works Director. This plan would ensure that construction traffic is routed in a way that maintains acceptable levels of service on all affected roadways and intersections that are currently measured and used by project-related vehicles. The traffic control plan would address the structural capacity of roads and bridges along routes that could be traveled by construction-related vehicles. The traffic control plan would ensure that the structural integrity of those roads and bridges would not be damaged by construction-related vehicle trips. If damage occurs, road surface would be repaired or replaced on Sale Lane and/or Altube Avenue.	
1B: 4-month Bypass	Bypass and Right Bank: Construction-related traffic impacts from construction of the proposed bypass channel are anticipated to be significant on Antelope Boulevard between Sale Lane and Belle Mill Road, although the roadway currently has a measured level of service D in the affected area. In addition, large construction vehicles could exceed the capacity of Sale Lane and Altube Avenue. Neither roadway is designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.	Bypass and Right Bank: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2A: 2-month Improved Ladder	Left and Right Banks: Large construction vehicles could exceed the capacity of Sale Lane and Altube Avenue. Neither roadway is designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.	Left and Right Banks: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
2B: 2-month with Existing Ladders	Right Bank: Large construction vehicles could exceed the capacity of Altube Avenue. This roadway is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.	Right Bank: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
3: Gates-out	Right Bank: Large construction vehicles could exceed the capacity of Altube Avenue. This roadway is not designed to accommodate heavy truck traffic, and daily commuting by heavy trucks could impact the road surface.	Right Bank: Mitigation identical to 4-month Improved Ladder Alternative.	Less than significant
Noise — *No significant impacts were identified*			
Environmental Justice — *No significant impacts were identified.*			