Chapter 17
Indian Trust Assets

Indian Trust Assets (ITAs) are defined as legal interests in property held in trust by the United States government for Indian tribes and individuals, or property protected under United States law for Indian tribes and individuals. ITAs can include land, minerals, Federally-reserved hunting and fishing rights, Federally-reserved water rights, and in-stream flows associated with a reservation or rancheria. By definition, ITAs cannot be sold, leased, or otherwise encumbered without approval of the United States.

Consistent with President William J. Clinton's 1994 memorandum, "Government-to-Government Relations with Native American Tribal Governments," Reclamation assesses the effect of its programs on tribal trust resources and Federally-recognized tribal governments. Reclamation is tasked to actively engage Federally-recognized tribal governments and consult with such tribes on a government-to-government level (59 Federal Register 1994). The U.S. Department of the Interior (DOI) Departmental Manual Part 512 ascribes the responsibility for ensuring protection of ITAs to the heads of bureaus and offices (Department of the Interior 1995). DOI is required to "protect and preserve Indian trust assets from loss, damage, unlawful alienation, waste, and depletion" (Department of the Interior 2000). Reclamation is responsible for assessing if the MIAD Modification Project alternatives would have the potential to affect ITAs. It is the general policy of Reclamation to perform its activities and programs in such a way as to protect ITAs and avoid adverse effects whenever possible (Reclamation 2008).

As shown in Figure 17-1, ITAs are not present within the area or adjacent to Folsom Reservoir or Mississippi Bar. There would be no impacts to ITAs from the MIAD Modification Project actions.

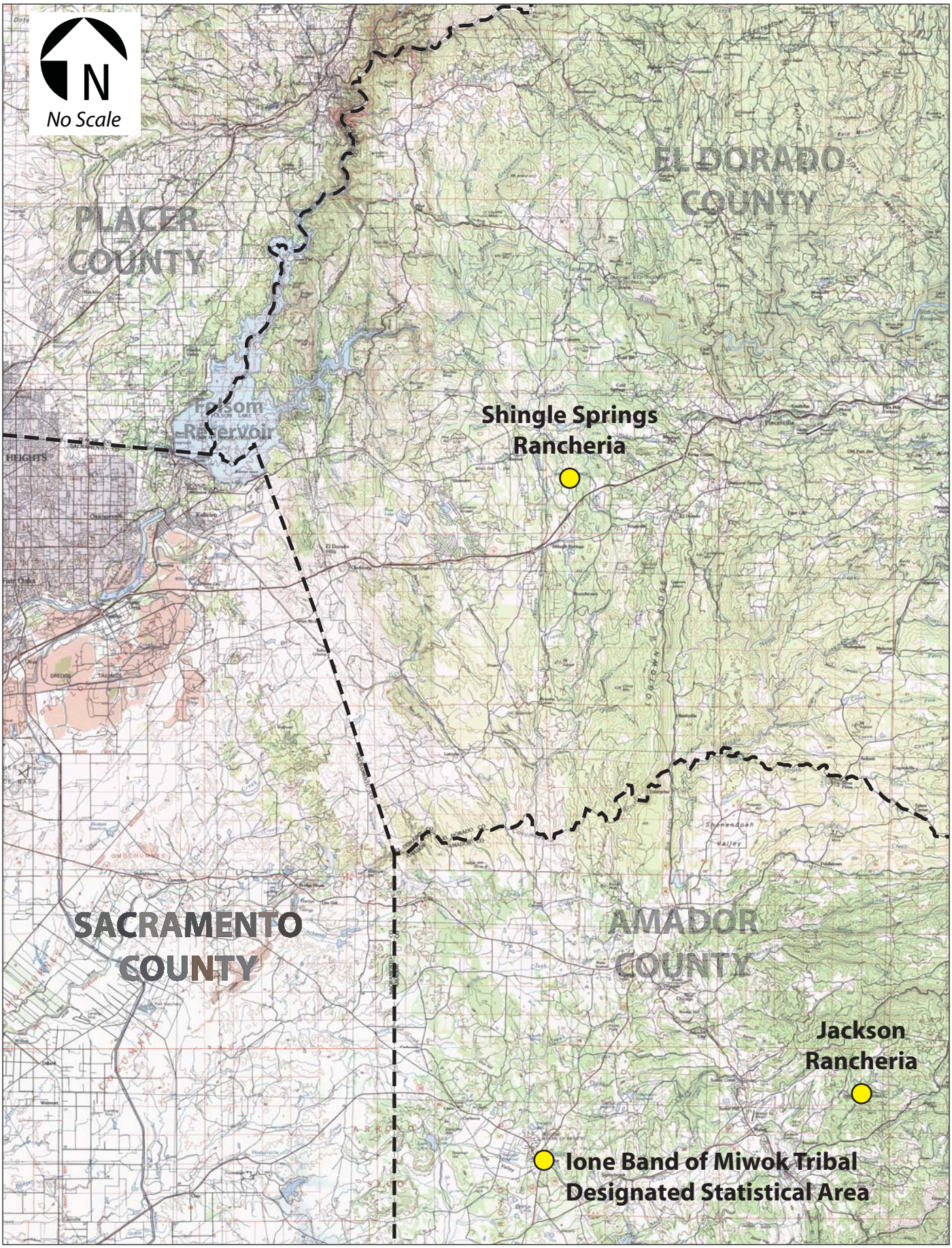

Figure 17-1. Indian Trust Assets Near Folsom Reservoir

17.1 References

59 Federal Register, 10877. 1994. Memorandum of April 29, 1994, *Government-to-Government Relations With Native American Tribal Governments*.

U.S. Bureau of Reclamation (Reclamation). 2008. *National Environmental Policy Handbook Public Review Draft*.

U.S. Department of the Interior. 1995. *Departmental Manual, Part 512: American Indian and Alaska Native Programs, Chapter 2: Departmental Responsibilities for Indian Trust Resources.* Accessed on: June 23 2009. Available at: http://elips.doi.gov/elips/release/3049.htm

U.S. Department of the Interior. 2000. *Order No. 3215, Principles for the Discharge of the Secretary's Trust Responsibility*. Available from http://www.usbr.gov/native/naao/policies/3215.html.

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Chapter 18
Environmental Justice

Environmental justice is generally defined as the fair treatment of all people regardless of race, color, nation of origin, or income. This section addresses the degree to which the MIAD Modification Project alternatives would comply with Federal and State regulations and guidelines pertaining to environmental justice, by identifying potentially disproportionately high and adverse human health or environmental effects on minority and/or low-income populations.

18.1 Affected Environment/Environmental Setting

This section describes the affected environment/environmental setting for environmental justice, including the area of analysis, applicable regulatory requirements, and existing conditions.

18.1.1 Area of Analysis

The area of analysis for the environmental justice is the area in which the collective environmental effects resulting from the MIAD Modification Project alternatives would be likely to occur. The area of analysis includes Sacramento County, El Dorado County, and the City of Folsom. Figure 18-1 shows the census tracts and block groups included in the area of analysis.

18.1.1.1 Mormon Island Auxiliary Dam

The 2000 Census Tract Block Groups identified for this analysis include the following:

- El Dorado County – Block Group 1, Census Tract 307.01 and Block Group 1, Census Tract 307.02
- City of Folsom (Sacramento County) – Block Group 2, Census Tract 85.01

18.1.1.2 Mississippi Bar

The 2000 Census Tract Block Groups used for this analysis include the following:

- Sacramento County – Block Group 2, Census Tract 80.05, Block Group 3, Census Tract 80.06, and Block Groups 4 and 5, Census Tract 82.07.

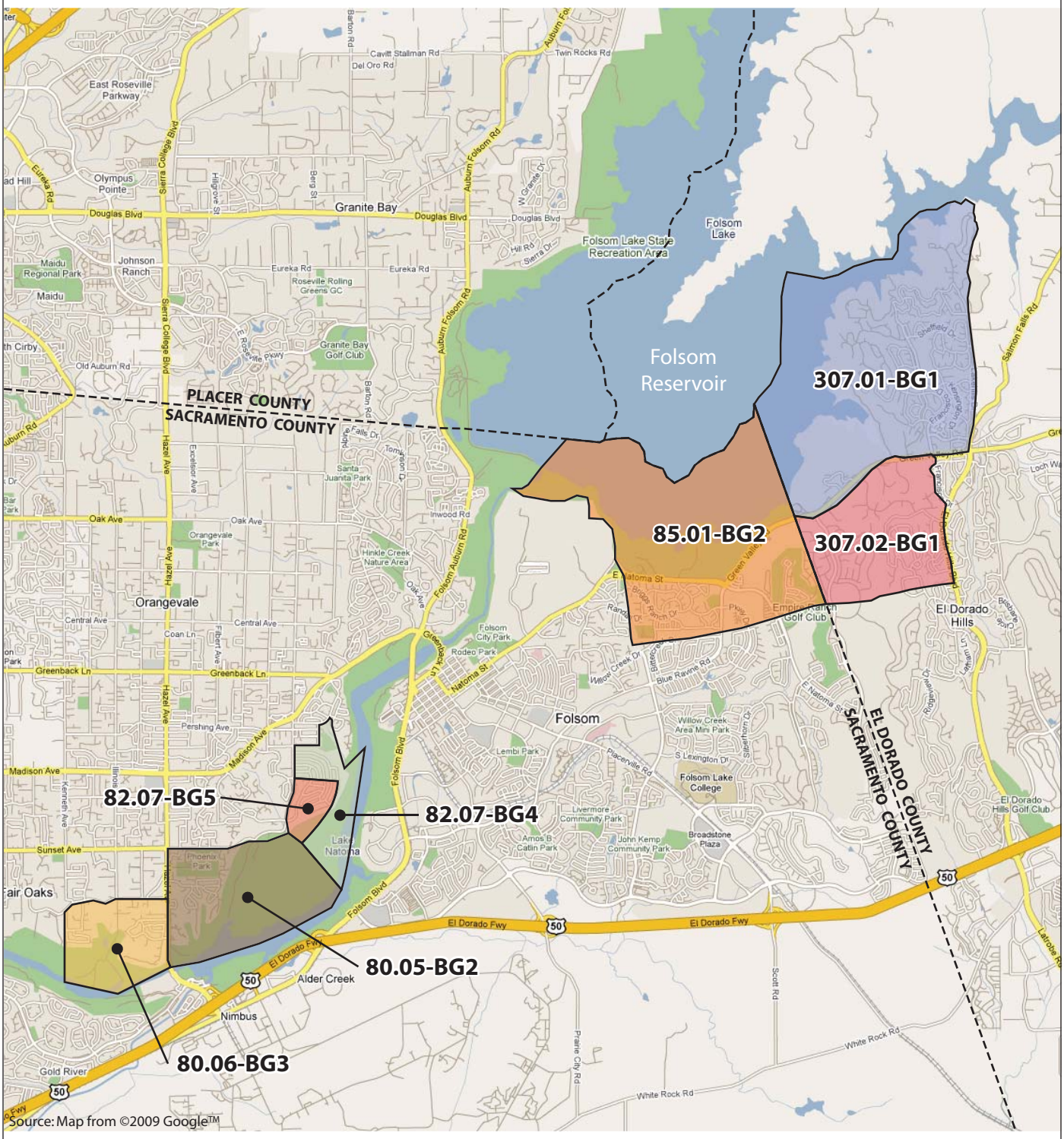

Figure 18-1. Affected Census Tracts and Block Groups

18.1.2 Regulatory Setting

18.1.2.1 Federal

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority and Low-Income Populations,” established the priority of analyzing environmental justice for any action that could cause disproportionately high and adverse impacts to a minority and/or or low-income population. All Federal agencies are required to include analysis of environmental justice within Environmental Impact Statements. Minority population is defined as including all non-white racial groups and Hispanics of any racial group; low-income population is defined based on Federal Poverty Guidelines (Council on Environmental Quality 1997).

Two principles are central to the analysis of environmental justice under Executive Order 12898:

- Fair treatment of all people regardless of race, color, nation of origin or income; and
- Promotion of public participation by minority and/or low-income populations.

Reclamation has established guidelines for analysis of environmental justice in EAs and EISs. Potential disproportionately high and adverse impacts to minority and/or low-income populations should be discussed and reasonable mitigation measures established as necessary. Active engagement of minority and low-income communities within the public scoping and involvement processes should be promoted. Consideration of minority cultural and language needs should be addressed when developing public involvement programs (Reclamation 2008).

18.1.2.2 State

California State Government Code Section 65040.12(e) defines environmental justice as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations and policies. The OPR is the coordinating agency in State government for environmental justice programs. OPR is responsible for developing guidelines for incorporating environmental justice into general plans.

Enacted at the same time as Government Code Section 65040.12, Public Resources Code Sections 71110-71116 designate the California Environmental Protection Agency (CalEPA) as the public agency to implement the State's environmental justice programs. Specifically, CalEPA is required to "promote enforcement of all health and environmental statutes within its jurisdiction in a manner that ensures the fair treatment of people of all races, cultures, and income levels, including minority populations and low income populations of the state." See Public Resources Code § 71110. CalEPA's other broad

responsibilities include the implementation of environmental justice in the design and implementation of programs, policies and activities, the implementation of enforcement efforts, the design of public participation activities, and conducting health and environmental research and data collection. Pursuant to this law, CalEPA has developed a model environmental justice mission statement and convened a Working Group and an Advisory Group to develop an agency-wide strategy for identifying and addressing any gaps in existing programs, policies, or activities that could impede the achievement of environmental justice. On October 7, 2003, the Advisory Group finalized and published their Environmental Justice Recommendations to the Working Group, which provide a set of comprehensive recommendations to establish and implement an effective environmental justice program at CalEPA.

Beyond these general environmental justice laws, there is currently no State requirement or specific guidance for addressing environmental justice under the CEQA. However, it is in recognition of the environmental justice principles and policies under Government Code Section 65040.12 and Public Resources Code Sections 71110-71116 and the still-developing Statewide approach to environmental justice, the subject issue is addressed in this section.

18.1.2.3 Local

Sacramento and El Dorado Counties' General Plans and the City of Folsom's General Plan do not include guidelines related to environmental justice.

18.1.3 Existing Conditions

Table 18-1 shows the demographic and income breakdown for each block group in the area of analysis. All of the block groups within the area of analysis are well below the Environmental Justice Threshold for minority populations (50 percent). None of the block groups have a large percentage of their population living below the Federal Poverty Guidelines.

Table 18-1. Demographic and Income for Block Groups Within the Area of Analysis

Parameter	Applicable Environmental Justice Threshold[1]	Block Group 1, Census Tract 307.01, El Dorado County, CA	Block Group 1, Census Tract 307.02, El Dorado County, CA	Block Group 2, Census Tract 80.05, Sacramento County, CA	Block Group 3, Census Tract 80.06, Sacramento County, CA	Block Group 4, Census Tract 82.07, Sacramento County, CA	Block Group 5, Census Tract 82.07, Sacramento County, CA	Block Group 2, Census Tract 85.01, Sacramento County, CA (Folsom)
Location	--	**MIAD**	**MIAD**	**Mississippi Bar**	**Mississippi Bar**	**Mississippi Bar**	**Mississippi Bar**	**MIAD**
Total Population	--	5,108	746	1,358	1,564	774	628	2,815
Total Minority Population[2]	--	737	69	166	263	71	43	465
Minority Percentage	50% or more	14.4%	9.2%	12.2%	16.8%	9.2%	6.8%	16.5%
Median Household Income	--	$99,728	$109,025	$71,250	$77,397	$83,999	$68,641	$100,250
Percentage Below 2000 Federal Poverty Guidelines	$17,050 for a family of four	1.8%	0.0%	3.9%	6.5%	4,1%	0.8%	1.9%

Source: 2000 U.S. Census Data from U.S. Census Bureau 2004a.
[1]Based on Environmental Justice – Guidance Under the National Environmental Policy Review Act, Council on Environmental Quality (CEQ), 1997, Page 25.
[2]Total population minus "white alone" plus Hispanics/Latinos who are white alone
MIAD = Mormon Island Auxiliary Dam

18.2 Environmental Consequences/Environmental Impacts

This section presents the environmental justice analysis for the area of analysis. A comprehensive analysis within the Folsom DS/FDR Draft EIS/EIR project area was completed for the Census Tract Block Groups identified for the MIAD in Section 18.1.1.1. No environmental justice impacts were identified for these groups in the Folsom DS/FDR EIR/EIS. The work proposed for the action alternatives below would be within the same project area as the Folsom DS/FDR project.

The area of analysis for Mississippi Bar was not analyzed as part of the Folsom DS/FDR EIR/EIS. Therefore, the analysis for this area is new and included below, along with the discussion of impacts for the MIAD area.

18.2.1 Assessment Methods

The USEPA's guidance for determining whether there is a minority community where environmental justice effects could occur gives both quantitative and qualitative measures: if the affected area's minority population is over 50 percent, and if the minority population in the affected area is "meaningfully greater" than that in the general population.

U.S. 2000 Census data was used to identify the percentage of minority and low income populations within the area of analysis to determine if environmental justice impacts would occur. Data indicate the percentage of individuals who are listed as minorities in census block groups in the area of analysis. The demographic analysis also identified percentages of area of analysis residents living below the poverty level.

18.2.2 Significance Criteria

Implementation of the MIAD Modification Project would result in a significant environmental justice impact if it would:

- Expose a minority or low-income population to disproportionately high and adverse impacts or hazards; or
- Not take efforts to encourage public participation within predominately minority or low-income population segments.

18.2.3 Environmental Consequences/Environmental Impacts of the No Action/No Project Alternative

Under the No Action/No Project Alternative, construction of the MIAD Modification Project improvements would not occur. All income levels and populations would be at the same risk if seismic, hydrologic, or static problems or a major flood occurred at Folsom Reservoir. Because there would be no disproportionate effect to minorities or low income populations, the No

Action/No Project Alternative would have no impact relative to environmental justice.

The No Action/No Project Alternative would have no impact to environmental justice.

18.2.4 Environmental Consequences/Environmental Impacts of Alternative 1

Actions under Alternative 1 would not have the potential to result in disproportionate impacts to minority or low-income populations.

The majority of the population in the area of analysis is not a minority and is living above the Federal poverty threshold. Therefore, based on demographics identified in Table 18-1, there would not be a disproportionate impact to minority or low-income populations or their property in the majority of the area of analysis.

Construction activities could temporarily increase noise, traffic, and air emissions in the vicinity of the site. The effects of increased noise would be experienced by all people within the surrounding areas of the MIAD Modification Project.

Increased traffic from construction activities would also affect a wide range of income levels and races in the area of analysis. Traffic could increase along the Highway 50 and Interstate 80 corridors, in the City of Folsom and unincorporated areas of Sacramento County near Mississippi Bar. Also, Alternative 1 proposes to relocate a portion of Green Valley Road which would cause traffic impacts during construction. These increases would affect all drivers and would not have any disproportionately high and adverse effects to minority and/or low-income populations. In general, because construction is planned throughout the area of analysis, any effects would fall on all residents within the area of analysis. Disproportionately high and adverse effects to minority and/or low-income populations would not occur from construction of Alternative 1.

Alternative 1 would also close recreation sites in the Folsom Lake State Recreation Area (FLSRA). The FLSRA is used by people of all income levels and race and would not affect minority and/or low income populations in a disproportionate way.

No disproportionately high and adverse effects to minority or low-income populations would occur under Alternative 1; therefore, Alternative 1 would not result in any environmental justice impacts.

Actions under Alternative 1 should involve efforts to include predominantly minority or low-income populations in public outreach activities.

No minority or low-income populations were found to be present in the area of analysis; therefore no specific public outreach efforts are required to include minority or low-income populations in public participation. The MIAD Modification Project held two public scoping meetings and advertised for these meetings in the local area newspaper (see Appendix A, Public Scoping Report).

Therefore, there would be no environmental justice impacts resulting from the public participation for the project.

18.2.5 Environmental Consequences/Environmental Impacts of Alternative 2

Impacts of Alternative 2 related to environmental justice would be the same as Alternative 1.

18.2.6 Environmental Consequences/Environmental Impacts of Alternative 3

Impacts of Alternative 3 related to environmental justice would be the same as Alternative 1.

18.2.7 Environmental Consequences/Environmental Impacts of Alternative 4

Impacts of Alternative 4 related to environmental justice would be the same as Alternative 1.

18.3 Comparative Analysis of Alternatives

There would be no impacts under any of the MIAD Modification Project alternatives with regard to environmental justice.

18.4 Environmental Commitments/Mitigation Measures

There would be no significant environmental justice impacts; therefore, no mitigation measures are required.

18.5 Potentially Significant and Unavoidable Impacts

There would be no potentially significant and unavoidable impacts to environmental justice under any of the MIAD Modification Project action alternatives.

18.6 Cumulative Effects

The MIAD Modification Project would have no environmental justice impacts and would not contribute to any cumulative environmental justice impacts.

18.7 References

Bureau of Reclamation. 2000. *National Environmental Policy Handbook Public Review Draft*.

Council on Environmental Quality. 1997. Environmental Justice – Guidance Under the National Environmental Policy Act, December 10, 1997.

Executive Order No. 12898. 1994. 59 Federal Register 7629. *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. February 11, 1994.

U.S. Census Bureau. 2004a. 2000 Census Data. Accessed: April 2009. Available from: http://www.census.gov/main/www/cen2000.html

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Chapter 19
Climate Change

Global climate change is caused by combined worldwide greenhouse gas (GHG) emissions, and mitigating global climate change will require worldwide solutions. GHGs play a critical role in the Earth's radiation budget by trapping infrared radiation emitted from the Earth's surface, which could have otherwise escaped into space. Prominent GHGs contributing to this process include water vapor, carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), ozone (O_3), and certain hydro- and fluorocarbons. This phenomenon, known as the "greenhouse effect," keeps the Earth's atmosphere near the surface warmer than it would be otherwise and allows for successful habitation by humans and other forms of life. Increases in these gases lead to more absorption of radiation and warm the lower atmosphere further, thereby increasing evaporation rates and temperatures near the surface. Emissions of GHGs in excess of natural ambient concentrations are thought to be responsible for the enhancement of the greenhouse effect and to contribute to what is termed "global warming," a trend of unnatural warming of the Earth's natural climate. Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors) and toxic air contaminants (TACs), which are pollutants of regional and local concern.

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socio-economic information relevant for the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC predicts substantial increases in temperatures globally of between 1.1 to 6.4 degrees Celsius (depending on the scenario) (IPCC, 2007).

Climate change could impact the natural environment in California in the following ways, among others:

- Rising sea levels along the California coastline, particularly along San Francisco's coastline and bayside and the San Joaquin delta due to ocean expansion and melting snowpack in the Sierra Nevada;

- Extreme-heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent;

- An increase in heat-related human deaths, infectious diseases, and a higher risk of respiratory problems caused by deteriorating air quality;

- Reduced snow pack and stream flow in the Sierra Nevadas, affecting winter recreation and water supplies;
- Potential increase in the severity of winter storms, affecting peak stream flows and flooding;
- Changes in growing season conditions that could affect California agriculture, causing variations in crop quality and yield;
- Changes in distribution of plant and wildlife species due to changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

These changes in California's climate and ecosystems are occurring at a time when California's population is expected to increase from 34 million to 59 million by the year 2040 (California Energy Commission [CEC] 2005).

As such, the number of people potentially affected by climate change, as well as the amount of anthropogenic GHG emissions expected under a "business as usual" scenario, is expected to increase. Similar changes as those noted above for California would also occur in other parts of the world with regional variations in resources affected and vulnerability to adverse effects. GHG emissions in California are attributable to human activities associated with industrial/manufacturing, utilities, transportation, residential, and agricultural sectors as well as natural processes.

19.1 Affected Environment/Environmental Setting

This section describes the area of analysis, regulatory setting, and affected environment/environmental setting for climate change.

19.1.1 Area of Analysis

The area of analysis for climate change is similar to the area of analysis for Chapter 6, Air Quality, and includes both MIAD and Mississippi Bar. Impacts from the MIAD Modification Project would occur in the two locations described below.

19.1.1.1 Mormon Island Auxiliary Dam

MIAD is located on the southeastern edge of Folsom Lake near the border of Sacramento and El Dorado Counties. While the majority of MIAD is located in Sacramento County, a small portion of the dam extends into El Dorado County. Emissions associated with construction truck traffic and worker commutes would occur within both Counties. MIAD is located in the SVAB.

19.1.1.2 Mississippi Bar

The Mississippi Bar mitigation site includes 80 acres of land on the western shore of Lake Natoma, near the intersection of Sunset Avenue and Main Avenue and south of the community of Orangevale. All proposed mitigation would occur on land parcels currently owned by DPR and Reclamation and managed by DPR as part of the FLSRA. The mitigation site is located entirely in Sacramento County and the SVAB.

19.1.2 Regulatory Setting

The current regulatory setting related to climate change and GHG emissions is summarized below.

19.1.2.1 Federal

Twelve U.S. States and Cities (including California), in conjunction with several environmental organizations, sued to force the USEPA to regulate GHGs as a pollutant pursuant to the Federal CAA (Massachusetts vs. Environmental Protection Agency et al. [U.S. Supreme Court No. 05– 1120]. Argued November 29, 2006—Decided April 2, 2007). The court ruled that the plaintiffs had standing to sue, that GHGs fit within the CAA's definition of a pollutant, and that the USEPA's reasons for not regulating GHGs were insufficiently grounded in the CAA.

On April 10, 2009, USEPA published the proposed mandatory greenhouse gas reporting rule in the *Federal Register* (74 FR 16448). This rule would require suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons of carbon dioxide equivalent (CO2e) per year to submit annual reports to the USEPA. Reporting will start in 2011 for the calendar year 2010 except for vehicle and engine manufacturers which will begin reporting for model year 2011. In August 2009, the rule was sent to the White House Office of Management and Budget for review. USEPA is expects to finalize the rule in October 2009.

On June 26, 2009, the American Clean Energy and Security Act of 2009 (HR 2454) was approved by the House of Representatives. This bill, also known as the Waxman-Markey Bill, requires entities to report their operational emissions if they exceed 10,000 tons (assumed to be metric tons) of CO2e per year and to enter a cap-and-trade program if they exceed 25,000 tons of CO2e per year. The bill is waiting for Senate approval.

NEPA does not include specific requirements for analysis of potential impacts related to climate change; however, CEQA includes guidance on evaluating potential impacts related to GHGs. For the purposes of this study, it will be assumed that if a project is below the CEQA thresholds of significance, then it will also be below the significance thresholds under NEPA.

19.1.2.2 State

California Assembly Bill (AB) 1493 required the California Air Resources Board (CARB) to develop and adopt the nation's first GHG standards for automobiles. The legislature declared in AB 1493 that global warming was a matter of increasing concern for public health and environment in the state. It cited several risks that California faces from climate change, including reduction in the state's water supply, increased air pollution creation by higher temperatures, harm to agriculture, increase in wildfires, damage to the coastline, and economic losses caused by higher food, water energy, and insurance prices. Further the legislature stated that technological solutions to reduce GHG emissions would stimulate the California economy and provide jobs.

California Executive Order S-3-05 established the following GHG emission reduction targets for California:

- by 2010, reduce GHG emissions to 2000 levels;
- by 2020, reduce GHG emissions to 1990 levels; and
- by 2050, reduce GHG emissions to 80 percent below 1990 levels.

California AB 32, the Global Warming Solutions Act of 2006, codifies the state's GHG emissions target by requiring the state's global warming emissions to be reduced to 1990 levels by 2020 and directs CARB to enforce the statewide cap that would begin phasing in by 2012. AB 32 was signed and passed into law by Governor Arnold Schwarzenegger on September 27, 2006. Key AB 32 milestones are as follows:

- June 30, 2007—Identification of "discrete" early action greenhouse gas emissions reduction measures.
- January 1, 2008—Identification of the 1990 baseline GHG emissions level and approval of a statewide limit equivalent to that level. Adoption of reporting and verification requirements concerning GHG emissions.
- January 1, 2009—Adoption of a scoping plan for achieving GHG emission reductions.
- January 1, 2010—Adoption and enforcement of regulations to implement the "discrete" actions.
- January 1, 2011—Adoption of GHG emission limits and reduction measures by regulation.
- January 1, 2012—GHG emission limits and reduction measures adopted in 2011 become enforceable.

Senate Bill 97 (SB 97) mandated that the Governor's Office of Planning and Research amend the state's CEQA Guidelines to address impacts from GHG. In compliance with this requirement, OPR released Preliminary Draft CEQA Guideline Amendments in January 2009; the draft Guideline Amendments were forwarded to the Natural Resources Agency in April 2009 and made available for public review and comment through August 27, 2009.

In the draft CEQA Guideline Amendments, OPR recommended the following criteria for significance related to GHG emissions:

- The extent to which the project could help or hinder attainment of the state's goals of reducing GHG emissions to 1990 levels by the year 2020 as stated in the Global Warming Solutions Act of 2006 (AB 32). A project may be considered to help attainment of the state's goals by being consistent with an adopted statewide 2020 GHG emissions limit, or the plans, programs, and regulations adopted to implement AB 32;

- The extent to which the project may increase the consumption of fuels or other energy resources, especially fossil fuels, that contribute to GHG emissions when consumed; and

- The extent to which the project impacts or emissions exceed any threshold of significance that applies to the project.

CARB released a Preliminary Draft Staff Proposal for Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act (CEQA) in October 2008 (CARB 2008). CARB's guidelines provide recommendations for assessing significance from operational and construction emissions from industrial and commercial/residential projects.

Although CARB's preliminary draft staff proposal suggests a quantitative threshold for assessing impacts from the operation of industrial projects, it prescribes the use of performance standards for construction-related emissions from all types of projects. CARB does not provide specific performance standards that should be used to address construction-related impacts. CARB is taking no further action at this time regarding the interim thresholds of significance, based largely on the fact that OPR is proceeding with amendments to the CEQA Guidelines that will better define the analytical requirements for climate change and GHG emissions in environmental documents (Ito 2009)..

19.1.2.3 Local

The SMAQMD presently has an interim recommendation (2007) on addressing climate change in CEQA documents and the District has updated their CEQA Guidelines in June 2009. SMAQMD recommends that GHG emissions are discussed in CEQA environmental documents for both construction and

operation phases of a project. CO_2, CH_4, and N2O are GHGs of primary concern from land use development projects, such as the MIAD Modification Project. The update includes the Guidance for Construction GHG Emissions Reduction which lists best management practices. There is no quantitative threshold for construction GHG emissions and the guidance requires quantification and documentation of emission reductions on a case-by-case basis.

19.1.3 Existing Conditions

Worldwide, California is the 12th to 16th largest emitter of CO_2, and is responsible for approximately two percent of the world's CO_2 emissions (CEC, 2006).Transportation is responsible for 38 percent of the state's GHG emissions, followed by electricity generation (22 percent), the industrial sector (21 percent), agriculture and forestry (6 percent), residential (6 percent), and other sources (6 percent). Emissions of CO_2 and N_2O are byproducts of fossil fuel combustion, among other sources. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices and landfills, among other sources. Sinks of CO_2 include uptake by vegetation and dissolution into the ocean. California GHG emissions in 2006 totaled approximately 485 million metric tons of carbon dioxide equivalents (MMT CO2e) (CEC 2009).

Table 19-1. Carbon Dioxide Equivalent Emissions by Sector in Sacramento County

Sector	Metric Tons CO_2e	Percent[1]
Transportation	6,731,929	48.3
Commercial & Industrial	2,292,627	16.5
Residential	2,439,527	17.5
Waste	741,528	5.3
Other[2]	1,729,016	12.4

Source: SMAQMD (2009)

Notes:

[1] Total emissions in Sacramento County are 13,934,627 metric tons CO_2e. Data year not specified.

[2] This category includes off-road equipment, high global warming potential gases, industrial-specific, agriculture, wastewater treatment, and the Sacramento International Airport.

Key:

CO_2e = carbon dioxide equivalent

Table 19-1 shows carbon dioxide equivalent emissions in Sacramento County by sector. Almost half of the emissions result from the transportation sector. Off-road equipment such as construction equipment falls under the "other" category, which is approximately 12 percent of the emissions in Sacramento County.

19.2 Environmental Consequences/Environmental Impacts

This section describes the method and results of GHG pollutant impacts assessment, as well as the significance criteria applicable to this project.

19.2.1 Assessment Methods

This section describes the methodology used to develop the emission inventories and the comparison of the analysis results to the significance thresholds discussed above.

19.2.1.1 Emission Calculation Methodology

In general, the construction emissions were estimated from various emission models and spreadsheet calculations, depending on the source type and data availability. The CARB OFFROAD2007 and EMFAC2007 (on-road vehicle emission factor) models were used along with emission factors obtained from USEPA AP-42 and California Climate Action Registry (CCAR) General Reporting Protocol (2009). SMAQMD recommends the use of URBEMIS for proposed land use development projects and the Roadway Construction Emissions Model for proposed linear projects. URBEMIS was developed to estimate emissions from a variety of projects such as residential, commercial and industrial developments. However, URBEMIS does not include specific features associated with dam construction and much of the emission calculations relied on other methods to estimate construction emissions. Annual emissions for each year of construction were estimated from appropriate emission factors, number of equipment and phases being worked and the associated schedules. The following construction sources and activities were analyzed for emissions:

- On-site construction equipment engine emissions (all pollutants) – based on OFFROAD2007 emission factors and estimated equipment schedules.
- Off-site haul truck engine emissions (all pollutants) – based on EMFAC2007 (engine emission factors), CCAR General Reporting Protocol, and estimated vehicle miles traveled.
- Off-site worker vehicle trips to and from the site, including paved road dust – based on EMFAC2007 (engine emission factors), CCAR General Reporting Protocol, and estimated vehicle miles traveled.
- Relocation of Green Valley Road – based on the SMAQMD Roadway Construction Emissions Model version 6.3-2.

To calculate the carbon dioxide equivalent (CO2e) amount for CH_4 and N_2O, the metric tons of CH_4 and N_2O were multiplied by their global warming potentials (GWP) from the IPCC Second Assessment Report (SAR) (1995) of

21 and 310, respectively. GWP is a measure of how much a given GHG is estimated to contribute to global warming, with CO_2 having a potential of 1. Although the IPCC released several assessment reports after the SAR, these specific GWPs are used because several existing bodies, including CARB, the California Climate Action Registry (CCAR), The Climate Registry, using the SAR factors. The following sections provide additional discussion of emission estimation methodologies used for each source group.

19.2.1.2 On-Site Construction Equipment Engine Emissions

The emission factors from CARB's OFFROAD2007 model were used to calculate on-site construction equipment emissions. Emission factors for diesel pumps used in the detention pond were obtained from AP-42 (USEPA 1996).

The emission factors were multiplied by the number of pieces of each equipment type that would be used during each phase of the MIAD Modification Project for each year of the analysis. The year with most construction equipment on site is 2011 for Alternative 1, 2, and 4, and is 2013 for Alternative 3. The peak number of equipment on site per day for the peak year of construction is summarized in Table 19-2. N_2O emission factor for on-site construction equipment in OFFROAD2007 is zero. Therefore, N_2O emissions were not calculated for construction equipment.

Table 19-2. Peak Daily Construction Equipment Counts in Peak Year[1]

Equipment Type	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Off-Highway Trucks	16	16	16	16
Dozers	11	11	11	11
Loaders	9	9	9	10
Compactors	6	6	6	6
Scrapers	6	6	4	4
Water Trucks	4	4	4	4
Pump	3	3	3	3
Pile Drill	0	0	0	1
Pile Driver	0	0	0	1
Total	55	55	53	56

Source: CDM 2009.

Notes:

[1] The peak year of emissions for Alternatives 1, 2, and 4 is 2011. The peak year of emissions for Alternative 3 is 2012.

The construction scheduling estimate for the MIAD Modification Project is based on two 10-hour shifts per work day.

19.2.1.3 Off-Site Haul Truck Engine Emissions

The haul truck engine emissions were calculated based on EMFAC2007 emission factors for heavy duty diesel trucks in Sacramento County, CCAR

General Reporting Protocol emission factor for N_2O, and estimates of total vehicle miles traveled per day. The worst-case round trip distance of 106 miles, determined to be the distance between Marysville and Folsom from Google™ Earth Pro, was used. The emission factors used in this analysis are presented in Table 19-3. The average speed for off-site hauling was assumed to be 30 mph.

Table 19-3. Heavy Duty Diesel Truck Emission Factors for Sacramento Valley (g/VMT)

Year	CO_2	CH_4	N_2O
2010	1,924	0.044	0.0048
2011	1,924	0.041	0.0048
2012	1,924	0.037	0.0048
2013	1,924	0.034	0.0048

Source: EMFAC2007, CCAR General Reporting Protocol (2009).

Key:
CH4 = methane
CO2 = carbon dioxide
g/VMT = gallons per vehicle miles traveled
N2O = nitrous oxide

19.2.1.4 Employee Commute Emissions

Emissions from employee commuting were calculated based on EMFAC2007 emission factors for passenger cars and light duty trucks in Sacramento County, CCAR General Reporting Protocol emission factor for N_2O, and estimates of total vehicle miles traveled per day. The URBEMIS default assumption of 50 percent passenger cars and 50 percent light duty trucks was used; for each vehicle class all fleet types (catalytic, non-catalytic, diesel) were used. Daily roundtrip distance for employee commute was estimated to be 40 miles. The average vehicle speed was assumed to be 55 mph.

Table 19-4. Emission Factors for Employee Commuting[1] in Sacramento Valley (g/VMT)

Year	CO_2	CH_4	N_2O[2]
2010	346.5	0.0215	0.0841
2011	346.2	0.0195	0.0841
2012	346.0	0.0175	0.0841
2013	345.9	0.0160	0.0841

Source: EMFAC2007, CCAR General Reporting Protocol (2009).

Notes:
[1] Fleet mix for "all" used (i.e., catalytic, non-catalytic, and diesel). Vehicle Class of 50 percent passenger cars (LDA) and 50 percent light-duty trucks (LDT1) assumed.
[2] 1993 N_2O emissions were used as a conservative estimate.

Key:
CH4 = methane
CO2 = carbon dioxide
g/VMT = gallons per vehicle miles traveled
N2O = nitrous oxide

19.2.1.5 Emissions from Relocation of Green Valley Road

In Alternative 1, Green Valley Road is relocated. Emissions from road construction were calculated using SMAQMD's Roadway Construction Emissions Model v6.3-2. The Roadway Construction Emissions Model is preferred by the SMAQMD over URBEMIS for linear construction projects.

19.2.2 Significance Criteria

As described above, SMAQMD has no quantitative threshold for construction GHG emissions and the guidance requires quantification and documentation of emission reductions on a case-by-case basis.

The project's incremental increases in GHG emissions associated with construction-related traffic (including potentially hauling spoils off-site) and off-road construction equipment would contribute to regional increases in GHG emissions and associated climate change effects.

SMAQMD's CEQA Guideline includes a list of best management practices for reducing greenhouse gas emissions from construction projects:

- Improve construction equipment fuel efficiency;
- Use alternative fuels (propane, solar, electrical);
- Use low carbon fuel (B20 biodiesel, renewable diesel);
- Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction workers;
- Reduce electricity use in construction office with energy efficiency measures;
- Recycle or salvage non-hazardous construction and demolition debris;
- Use locally sourced or recycled materials for construction;
- Minimize amount of concrete or use low carbon concrete;
- Produce concrete on-site if less emissive than transporting ready mix;
- Use USEPA certified SmartWay trucks;
- Develop a plan to efficiently use water for dust control.

The SMAQMD CEQA Guidelines also allow a lead agency to consider other agencies' thresholds of significance for project impacts. The South Coast Air Quality Management District (SCAQMD) established a quantitative threshold of 10,000 metric tons CO2e per year for industrial sources. The threshold is intended to include direct, indirect, and, to the extent information is available, life cycle emissions during construction and operation. Construction emissions are to be amortized over the life of the project, defined as 30 years, and then added to operational emissions. The SCAQMD's quantitative threshold will also be reviewed in association with the SMAQMD's BMP requirements to assess significance.

19.3 Environmental Consequences/Environmental Impacts

19.3.1 No Action/No Project Alternative

The No Action/No Project Alternative would not result in any emissions; therefore it would not have any impacts that would contribute to climate change.

19.3.2 Alternatives 1 - 4

The project's Emissions of GHG would occur during construction activities at the proposed site. Typical construction activities include excavation, soil hauling, and site grading, all of which would contribute to on- and off-site diesel exhaust emissions. Since no operational sources are part of the MIAD Modification Project, only construction climate change impacts were analyzed.

Construction impacts were estimated following the methodology described above. Table 19-5 provides a summary of peak annual emission rates for CO_2, CH_4 and N_2O. For all alternatives, peak annual emissions occur in 2011. Table 19-6 summarizes annual and project total emissions in CO2e metric tons. Detailed calculation tables by general source categories are included in Appendix E.

Table 19-5. Uncontrolled Construction Emission Inventories – Peak Annual Emissions[1] (metric tons per year)

Alternative	CO_2	CH_4	N_2O	CO_2e[2]
1	5,340	0.16	0.10	5,374
2	5,311	0.17	0.11	5,347
3	5,941	0.18	0.11	5,971
4	6,620	0.19	0.12	6,662

Notes:

[1] Peak annual GHG emissions occurs in 2011 for all alternatives.

[2] Carbon dioxide equivalent metric tons per year is calculated by multiplying the CH_4 emissions by 21 and N_2O emissions by 310.

Keys:

CH4 = methane

CO2 = carbon dioxide

CO_2e = carbon dioxide equivalent

N2O = nitrous oxide

Table 19-6. Uncontrolled Construction Emission Inventories – Annual Emissions and Total Project Emissions (MT CO_2e)

Alternative	2010	2011	2012	2013	Total Project
1	1,998	5,374	1,560	105	9,037
2	2,013	5,347	1,534	105	8,998
3	2,010	5,971	4,250	105	12,336
4	3,118	6,662	2,179	105	12,063

Notes:
[1] Carbon dioxide equivalent metric tons per year is calculated by multiplying the CH_4 emissions by 21 and N_2O emissions by 310.
Keys:
MT CO_2e = metric tons of carbon dioxide equivalent

Although CH_4 and N_2O have higher global warming potential, their contribution to the total annual or project CO_2e emissions is insignificant compared to the CO_2 emissions. The majority of CO_2 emissions result from construction equipment and haul truck engines. Table 19.2-5 shows that Alternative 3 has the highest total project greenhouse gas emissions, followed by Alternative 4, 1, and 2. Alternatives 1 and 2 have similar peak annual by compound, total annual, and total project emissions.

Although there is no quantitative threshold in the SMAQMD CEQA Guideline, it includes BMPs to mitigate GHG emissions. The BMPs will be implemented to the extent possible to reduce GHG emissions. Also, the GHG emissions from each year and alternative are less than the SCAQMD's quantitative threshold of 10,000 metric tons CO2e per year. Impacts associated with climate change are therefore expected to be less than significant.

19.4 Environmental Commitments/Mitigation Measures

SMAQMD lists BMPs in the draft CEQA Guide (2009) to mitigate GHG emissions. These include improving efficiency of construction equipment and other vehicles, fuel switching to a less carbon intensive fuel, using local and/or onsite materials, and providing alternative transportation to employees to reduce personal vehicle use.

Existing CARB regulations (Title 13 of the California Code of Regulations, Sections 2480 and 2485), which limit idling of diesel-fueled commercial motor vehicles, would help to limit GHG emissions associated with project-related construction vehicles. In addition, CARB's proposed Early Action Measures (pursuant to the California Global Warming Solutions Act of 2006) include other emission reduction measures for diesel trucks and diesel off-road equipment. CARB will review and adopt Early Action Measures by January 1, 2010, and after 2010 construction equipment could be subject to these

requirements. Once such measures go into effect, construction contractors would be subject to these requirements, and MIAD Modification Project will implement these measures as required. Emissions from construction activities are expected to reduce accordingly.

19.5 Cumulative Effects

Table 22-1 lists projects considered in the cumulative analysis. Many of the projects include construction within the surrounding region. Construction of these projects would increase emissions of GHG pollutants from onsite construction and transport of materials. Each project would need to mitigate individual climate change effects, which would decrease overall cumulative effects. However, without consideration of scheduling and sequence of activities, concurrent construction projects within and adjacent to MIAD would have significantly increased GHG emissions.

19.6 References

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Chapter 20
Socioeconomics

This chapter describes the regional economy within the area of analysis and presents the potential economic effects of implementing the MIAD Modification Project alternatives and the No Action/No Project Alternative.

20.1 Affected Environment/Environmental Setting

20.1.1 Area of Analysis

The area of analysis includes Sacramento, Placer, and El Dorado Counties where potential economic effects could occur from implementation of the alternatives. Although MIAD and Mississippi Bar actions would occur in Sacramento and El Dorado Counties, Placer County has close economic ties with Sacramento and El Dorado Counties and also borders Folsom Reservoir and the FLSRA, where many local residents go to recreate. Because of the economic linkages and the frequent movement of residents across counties, the regional economic area of analysis includes Sacramento, Placer and El Dorado Counties.

20.1.2 Existing Conditions

20.1.2.1 Sacramento County

Income and Industry Earnings In 2007, Sacramento County had a total population of about 1.4 million. Of the population 16 years and over, 60.4 percent were employed (U.S. Census Bureau 2009a). Total personal income in Sacramento County was about $50.2 billion and mean per capita personal income was $36,340 (Bureau of Economic Analysis [BEA] 2009a). From 1997-2007, average annual growth rate of per capita personal income in Sacramento County was 4.2 percent. Sacramento County ranked 11th among counties in the State in total personal income and 22nd in per capita personal income in 2007 (BEA 2009a). In 2007, median family income was $64,520; 9.2 percent of families lived below the poverty level (U.S. Census Bureau 2009a). In 2007, the poverty level for a family of two was an annual income of $13,540 and $21,203 for a family of four (US Census Bureau 2008).

Table 20-1 shows 2007 industry earnings in Sacramento County. Top earning industries include government and government enterprises, professional and technical services, and health care and social assistance.

Table 20-1. Industry and Industry Earnings, Sacramento County, 2007

Industry	Earnings 1000$
Forestry, fishing, related activities, and other	$39,708
Mining	$62,653
Utilities	$115,981
Construction	$3,202,305
Manufacturing	$1,894,868
Wholesale trade	$1,335,522
Retail trade	$2,659,713
Transportation and warehousing	$794,910
Information	$1,239,175
Finance and insurance	$3,061,049
Real estate and rental and leasing	$1,025,835
Professional and technical services	$4,564,865
Management of companies and enterprises	$508,057
Administrative and waste services	$1,545,243
Educational services	$392,103
Health care and social assistance	$4,146,849
Arts, entertainment, and recreation	$330,289
Accommodation and food services	$977,198
Other services, except public administration	$1,344,070
Government and government enterprises	$14,463,562

Source: BEA 2009b, Regional Economic Information System

Employment Table 20-2 shows industry employment and total employee compensation in Sacramento County in 2007. Total employment was 825,155. In 2007, government and government enterprises employed the most people, followed by retail trade, health care and social assistance and professional and technical services (BEA 2009b). Average compensation per job in Sacramento County was $59,779 in 2007 (BEA 2009b). In 2007, Sacramento County's unemployment rate was 7.5 percent (U.S. Census Bureau 2009a).

Major employers in Sacramento County in 2009 include: Aerojet General Corp, AMPAC Fine Chemicals, California State University, Sacramento City College, Delta Dental, Kaiser Foundation Hospital, Mercy Hospitals, Mercy San Juan Medical Center, Sutter Memorial Hospital, UC Davis Medical Center, UC Davis Medical Group, UC Davis Health System, Sacramento Municipal Utility District (SMUD), and the Sacramento Bee Newspaper. Government departments with high employment include Sacramento County Water Quality, Environmental Protection Agency, Air Resources Board, Corrections, Health Services, Employment Development, Social Services, Water Resources, and Education (EDD 2009a).

Table 20-2. Industry Employment and Compensation, Sacramento County, 2007

Industry	Employment # Jobs	Compensation 1000$
Forestry, fishing, related activities, and other	1,578	$31,225
Mining	685	$22,773
Utilities	790	$113,939
Construction	56,201	$2,615,981
Manufacturing	25,688	$1,804,437
Wholesale trade	21,626	$1,243,420
Retail trade	82,854	$2,356,022
Transportation and warehousing	17,263	$639,459
Information	17,856	$1,183,302
Finance and insurance	46,219	$2,839,224
Real estate and rental and leasing	36,322	$543,987
Professional and technical services	62,244	$3,736,916
Management of companies and enterprises	6,621	$507,657
Administrative and waste services	52,841	$1,363,352
Educational services	15,429	$373,993
Health care and social assistance	75,861	$3,805,164
Arts, entertainment, and recreation	14,913	$268,081
Accommodation and food services	50,804	$924,277
Other services, except public administration	45,646	$1,149,547
Government and government enterprises	190,763	$14,463,562

Source: BEA 2009b, Regional Economic Information System

20.1.2.2 Placer County

Income and Industry Earnings In 2007, Placer County had a total population of about 328,000. Of the population 16 years and over, 62.3 percent were employed (U.S. Census Bureau 2009b). Total personal income in Placer County was about $15.1 billion and mean per capita personal income was $45,471 (BEA 2009a). From 1997-2007, average annual growth rate of per capita personal income in Placer County was 4.0 percent. Placer County ranked 20th among counties in the state in total personal income and 14nd in per capita personal income in 2007 (BEA 2009a). In 2007, median family income was $82,641; 4.1 percent of families lived below the poverty level (U.S. Census Bureau 2009b).

Table 20-3 shows 2007 industry earnings in Placer County. Top earning industries include construction, government and government enterprises, health care and social assistance, and retail trade.

Table 20-3. Industry and Industry Earnings, Placer County, 2007

Industry	Earnings 1000$
Forestry, fishing, related activities, and other	$3,455
Mining	$12,247
Utilities	$84,517
Construction	$1,290,334
Manufacturing	$860,428
Wholesale trade	$297,345
Retail trade	$990,906
Transportation and warehousing	$238,283
Information	$223,151
Finance and insurance	$819,969
Real estate and rental and leasing	$380,939
Professional and technical services	$697,239
Management of companies and enterprises	$75,326
Administrative and waste services	$293,436
Educational services	$69,274
Health care and social assistance	$995,654
Arts, entertainment, and recreation	$90,641
Accommodation and food services	$358,082
Other services, except public administration	$252,285
Government and government enterprises	$1,194,018

Source: BEA 2009b, Regional Economic Information System

Employment Table 20-4 shows industry employment and total employee compensation in Placer County in 2007. Total employment was 197,426. In 2007, retail trade employed the most people, followed by construction, government and government enterprises, health care and social assistance and accommodation and food services. Average compensation per job in Placer County was $53,552 in 2007. In 2007, Placer County's unemployment rate was 5.0 percent (U.S. Census Bureau 2009b).

Major employers in Placer County in 2009 include: Alpine Meadows, Auburn Area Answering Service, Cetch Mobile Service, Club Cruise Inc, Coherent Inc, Formica Corp, Hewlett Packard Co, Kaiser Permanente, NEC Electronic USA, Oracle Corp, Progressive Technology, Resort at Squaw Creek, Sierra Community College District, Sure West Communications, Sutter Auburn Faith Hospital, Sutter Roseville Medical Center, Thunder Valley Casino, and United Natural Foods. Government departments with high employment include Food Stamps, Placer County Humane Services, Sherriff, Superintendent, and Welfare to Work (EDD 2009b).

Table 20-4. Industry Employment and Compensation, Placer County, 2007

Industry	Employment # Jobs	Compensation 1000$
Forestry, fishing, related activities, and other	274	$413
Mining	215	$3,384
Utilities	798	$83,813
Construction	20,445	$954,079
Manufacturing	9,384	$860,274
Wholesale trade	5,128	$276,334
Retail trade	27,205	$851,791
Transportation and warehousing	3,802	$205,566
Information	3,187	$213,058
Finance and insurance	12,014	$732,415
Real estate and rental and leasing	16,256	$170,762
Professional and technical services	13,422	$517,853
Management of companies and enterprises	943	$75,311
Administrative and waste services	10,007	$247,649
Educational services	3,253	$65,665
Health care and social assistance	17,696	$875,993
Arts, entertainment, and recreation	5,293	$80,458
Accommodation and food services	17,096	$338,944
Other services, except public administration	10,036	$197,734
Government and government enterprises	19,699	$1,194,018

Source: BEA 2009b, Regional Economic Information System

20.1.2.3 El Dorado County

Income and Industry Earnings In 2007, El Dorado County had a total population of about 175,000. Of the population 16 years and over, 63.4 percent were employed (U.S. Census Bureau 2009c). Total personal income in El Dorado County was about $8.0 billion and mean per capita personal income was $45,725 (BEA 2009a). From 1997-2007, average annual growth rate of per capita personal income in El Dorado County was 4.5 percent. El Dorado County ranked 26th among counties in the state in total personal income and 12nd in per capita personal income in 2007 (BEA 2009a). In 2007, median family income was $79,116; 6.1 percent of families lived below the poverty level (U.S. Census Bureau 2009).

Table 20-5 shows 2007 industry earnings in El Dorado County. Top earning industries include government and government enterprises, construction, professional and technical services, and health care and social assistance.

Table 20-5. Industry and Industry Earnings, El Dorado County, 2007 (1000 $)

Industry	Earnings
Forestry, fishing, related activities, and other	$21,322
Mining	$12,602
Utilities	$13,299
Construction	$569,284
Manufacturing	$142,000
Wholesale trade	$80,892
Retail trade	$263,389
Transportation and warehousing	$39,224
Information	$52,793
Finance and insurance	$242,421
Real estate and rental and leasing	$136,636
Professional and technical services	$490,844
Management of companies and enterprises	$12,151
Administrative and waste services	$170,290
Educational services	$29,425
Health care and social assistance	$362,663
Arts, entertainment, and recreation	$49,641
Accommodation and food services	$131,374
Other services, except public administration	$142,531
Government and government enterprises	$591,630

Source: BEA 2009, Regional Economic Information System

Employment Table 20-6 shows industry employment and total employee compensation in El Dorado County in 2007. Total employment was 97,906. In 2007, real estate and rental and leasing employed the most people; followed by construction, retail trade, professional and technical services, and government and government enterprises. Average compensation per job in El Dorado County was $47,738 in 2007. In 2007, El Dorado County's unemployment rate was 6.0 percent.

Major employers in El Dorado County in 2009 include: Barton Memorial Hospital, Camp Richardson Resort, Cemex, DST Output, Embassy Suites, Fortune 800, Lake View Lodge, Lake Tahoe Community College, Marriott, Marshall Hospital, McClone Construction Co, More Recycling Center, Sierra-at-Tahoe, Spare time Inc, and Walmart. Government departments with high employment include Child Development Programs, Sherriff, Social Services, Superior Court, Transportation, and the El Dorado Irrigation District (EDD 2009c).

Table 20-6. Industry Employment and Compensation, El Dorado County, 2007

Industry	Employment # Jobs	Compensation 1000$
Forestry, fishing, related activities, and other	580	$10,723
Mining	203	$3,894
Utilities	137	$12,798
Construction	10,425	$363,467
Manufacturing	2,420	$141,936
Wholesale trade	1,803	$63,078
Retail trade	10,029	$209,461
Transportation and warehousing	1,079	$21,705
Information	1,352	$44,864
Finance and insurance	5,508	$199,768
Real estate and rental and leasing	11,170	$35,053
Professional and technical services	9,878	$324,780
Management of companies and enterprises	280	$12,136
Administrative and waste services	6,239	$113,972
Educational services	1,731	$25,356
Health care and social assistance	7,659	$282,845
Arts, entertainment, and recreation	3,333	$39,866
Accommodation and food services	7,030	$120,435
Other services, except public administration	6,354	$94,610
Government and government enterprises	9,689	$591,630

Source: BEA 2009b, Regional Economic Information System

20.2 Environmental Consequences/Environmental Impacts

20.2.1 NEPA/CEQA Guidance

For CEQA and NEPA analyses, social and economic changes resulting from a project are addressed differently than physical environmental effects, and furthermore, somewhat differently under CEQA than under NEPA. CEQA does not consider economic or social changes resulting from a project as adverse effects on the environment. If a physical change in the environment is caused by economic or social effects, the physical change may be regarded as an adverse effect. Because the economic effects of project components do not change the physical environment, a CEQA analysis is not necessary.

Under NEPA, economic or social effects must be discussed if they are inter-related to the natural or physical environmental effects of a project. Since economic effects of the modifications to MIAD are related to physical environmental effects, a NEPA analysis is required. However, NEPA does not require that economic impacts be judged for significance.

20.2.2 Assessment Methods

The following subsections describe the methods to analyze economic effects of the MIAD alternatives to recreational spending and construction activities. It is important to note that these estimated impacts are temporary and would only occur during the period of construction.

20.2.2.1 Recreation Economic Impact Assessment

FLSRA is an important local, regional, and state recreation resource. Recreation generates sales, profits, jobs, tax revenues, and income in the study area. The MIAD and Mississippi Bar facilities are not primary recreation sites at the FLSRA and do not generate substantial revenues. Both have free access and are limited to day use activities. As a result, recreational spending for MIAD and Mississippi Bar is limited. Spending could include food, drinks, or gasoline, but would not include larger expenditures such as hotels, boating supplies, or camping supplies. Therefore, there would not be any lost expenditures in the region associated with overnight use or boating. Because there are no entry fees, State Treasury revenues would not be affected. Spending for food, gas, and other goods are based on average spending profiles established by the Corps (2003). The analysis assumes that visitor spending on food, gas, and other goods for day use activities is about $12.25 per day (Corps 2003).

It is important to note that local residents may not spend any money for use of MIAD or Mississippi Bar. Many local residents use the trail for walking, jogging, biking, and other activities that do not involve spending. A California State Parks survey indicated that 87 percent of users of major State recreation areas live within 60 minutes of the site and the average travel time for all visitors is 45 minutes (DPR 2003). An on-site survey of recreation users for FLSRA indicated that 70 percent of visitors to FLSRA originated from the 3-county region (Fletcher 2004). Further, because of the limited recreational opportunities at MIAD and Mississippi Bar, it is likely that a higher percentage of users are local residents of the area. Out-of-region visitors would likely use more established sites, such as Folsom Point or Beal's Point, with formal recreation facilities. Therefore, this analysis assumes that all users to MIAD and Mississippi Bar are local residents from the surrounding communities.

Any reductions in recreational spending would be temporary. Recreation would be restored after construction of the project alternatives.

20.2.2.2 Construction-related Economic Impact Assessment

Construction associated with the MIAD alternatives would create jobs and generate additional economic activity within the local region during the period of construction.[1] Table 20-7 summarizes the total number of workers required for each year of project construction for the four alternatives. The analysis

[1] Because the MIAD Modifications would be a government funded project, economic impacts of increased construction activity at the State level may be offset because funding could be unavailable for another project. Therefore, the benefits of construction-related economic effects are focused on the local region.

assumes that the 3-county region labor pool would supply the construction workers necessary for the MIAD modifications.

Table 20-7. Total Annual Number of Workers Required by MIAD Modification Alternatives

Alternative	2010	2011	2012	2013
Alternative 1	94	160	100	50
Alternative 2	58	184	160	50
Alternative 3	58	174	150	50
Alternative 4	58	174	150	50

This analysis evaluates economic impacts from construction using IMPLAN estimates from the Folsom DS/FDR EIS/EIR analysis, escalated to 2007 dollars.[2] Construction expenditures generate economic activity within a region. Any given industry typically purchases goods and services from -- and sells goods and services to -- another industry within a given geographic area, which in turn, sells to or buys from other industries or supplies final consumers. IMPLAN uses these inter-industry linkages and provides a tool to estimate the total economic effects within a region from a change in final demand to one economic sector. Total economic effects include:

- Direct effects – changes in final demand;
- Indirect effects – changes in expenditures within the region in industries supplying goods and services; and
- Induced effects – changes in expenditures of household income.

The Folsom DS/FDR economic analysis estimated annual total economic effects to value of output, value added, and employment of employing 100 construction workers on an annual basis. If construction is shorter than a year, economic benefits would be less. Table 20-8 shows the direct, indirect, induced and total economic effects, as calculated by IMPLAN. The total annual economic effect of employing 100 workers would be an increase of about $17.3 million in total value of output, $10.2 million in value added, and 168 jobs. The values are scaled to the jobs shown in Table 20-8 to estimate potential economic benefits for all the alternatives.

[2] IMPLAN (Impact Planning and Analysis) is an input-output (I-O) database and modeling software to estimate economic impacts of the project alternatives. An I-O analysis describes and analyzes the relationship among industries. (Minnesota IMPLAN Group (MIG) 2003 http://www.implan.com/index.html)

Table 20-8. Total Annual Economic Effects of Employing 100 Construction Workers, 2007 Values

Economic Effects	Value of Output, $	Value Added, $	Employment, Jobs
Direct Impacts	$10,198,200	$5,769,300	100
Indirect Impacts	$2,835,700	$1,725,400	27
Induced Impacts	$4,276,400	$2,727,300	41
Total Impacts	$17,310,300	$10,222,000	168

20.2.3 Environmental Consequences/Environmental Impacts of the No Action/No Project Alternative

The No Action/No Project Alternative would maintain the current recreation activities at MIAD and Mississippi Bar. Under the No Action/No Project Alternative, current recreational activities at would continue with no reduction in recreational spending or revenues. There would be no construction at MIAD or Mississippi Bar as proposed under the action alternatives. The regional economy would not benefit from increased employment or spending as a result of construction. No changes to economic conditions and trends are expected to occur under the No Action/No Project Alternative.

20.2.4 Environmental Consequences/Environmental Impacts of Alternative 1

Economic Impacts from Reduced Recreational Spending

The analysis assumes that all visitors to MIAD and Mississippi Bar are local residents of the three-county region. Therefore, no money from outside the region would be spent within the region for recreation at MIAD or Mississippi Bar.

Displaced visitors to MIAD or Mississippi Bar would be able to find open, alternate recreation at the FLSRA. Many areas within the FLSRA offer similar activities, such as hiking, biking, picnicking, bird watching, etc. Local visitors would likely find a substitute recreation activity within the study area and continue to spend money within retail, food, and other recreation-related sectors. Therefore, local spending for food, restaurants, and gasoline would continue in the study area. In some instances, money may not be spent on the exact goods, such as picnic supplies, but it would likely be spent elsewhere in the local economy (for example, on movie tickets). The daily spending of $12.25 of some visitors at MIAD or Mississippi Bar would continue because they visit an alternate recreation site or do another activity. Money would remain within the regional economy; therefore, there would be no regional economic effects from reduced expenditures at MIAD or Mississippi Bar under Alternative 1.

Economic Impacts from Construction at MIAD

Construction expenditures would increase output, value added, and employment within the study area. Approximately 404 workers would be needed to complete construction during the 2010 to 2013 timeframe. Table 20-9 presents total economic effects from construction of Alternative 1. Effects would be temporary and only occur during the construction period. The impacts would benefit the regional economy.

Table 20-9. Annual Total Economic Impacts During Construction of Alternative 1, 2007 Values

Year	Number of Workers	Value of Output, $	Value Added, $	Employment, Jobs
2010	94	$16,271,682	$9,608,680	158
2011	160	$27,696,480	$16,355,200	269
2012	100	$17,310,300	$10,222,000	168
2013	50	$8,655,150	$5,111,000	84

IMPLAN generates direct employment numbers estimates based on the expected value of output that a full time worker could produce. Induced effects are then estimated with average wage data, which IMPLAN bases on state levels. IMPLAN data shows that average annual salary for full-time construction laborer ranges from $46,000 to $50,000, or about $22.10 to $24.04 per hour. These values are slightly higher than local data. According to California Labor Market Data Library wage and salary data for employment in California industries, construction laborers in the Sacramento Metropolitan Statistical Area earned an average hourly wage of $18.33 per hour in 2009 (California Labor Market Information Data Library 2009). The IMPLAN wage averages include regions of California, such as Los Angeles and the San Francisco Bay Area, where wages area typically higher. Considering this data, the level of total economic effects may be less than those identified in Table 20-9.

20.2.5 Environmental Consequences/Environmental Impacts of Alternative 2

Economic Impacts from Reduced Recreational Spending

Impacts from reduced recreational spending under Alternative 2 would be the same as Alternative 1.

Economic Impacts from Construction at MIAD

Construction expenditures would increase output, value added, and employment within the study area. Approximately 452 workers would be needed to complete construction during the 2010 to 2013 timeframe. Table 20-10 presents total economic effects from construction of Alternative 2. Effects would be temporary and only occur during the construction period. The impacts would benefit the regional economy. Similar to Alternative 1, impacts may be less than those presented in Table 20-10 because of lower employee compensation in the three-county region relative to statewide averages used in IMPLAN.

Table 20-10. Annual Total Economic Impacts During Construction of Alternative 2, 2007 Values

Year	Number of Workers	Value of Output, $	Value Added, $	Employment, Jobs
2010	58	$31,850,952	$27,696,480	$8,655,150
2011	184	$18,808,480	$16,355,200	$5,111,000
2012	160	309	269	84
2013	50	$31,850,952	$27,696,480	$8,655,150

20.2.6 Environmental Consequences/Environmental Impacts of Alternative 3

Economic Impacts from Reduced Recreational Spending

Impacts from reduced recreational spending under Alternative 3 would be the same as Alternative 1.

Economic Impacts from Construction at MIAD

Construction expenditures would increase output, value added, and employment within the study area. Approximately 432 workers would be needed to complete construction during the 2010 to 2013 timeframe. Table 20-11 presents total economic effects from construction of Alternative 1. Effects would be temporary and only occur during the construction period. The impacts would benefit the regional economy. Similar to Alternative 1, impacts may be less than those presented in Table 20-11 because of lower employee compensation in the three-county region relative to statewide averages used in IMPLAN.

Table 20-11. Annual Total Economic Impacts During Construction of Alternative 3, 2007 Values

Year	Number of Workers	Value of Output, $	Value Added, $	Employment, Jobs
2010	58	$30,119,922	$25,965,450	$8,655,150
2011	174	$17,786,280	$15,333,000	$5,111,000
2012	150	292	252	84
2013	50	$30,119,922	$25,965,450	$8,655,150

20.2.7 Environmental Consequences/Environmental Impacts of Alternative 4

Economic Impacts from Reduced Recreational Spending

Impacts from reduced recreational spending under Alternative 4 would be the same as Alternative 1.

Economic Impacts from Construction at MIAD

Construction expenditures would increase output, value added, and employment within the study area. Approximately 432 workers would be needed to complete construction during the 2010 to 2013 timeframe. Table 20-12 presents total economic effects from construction of Alternative 4. Effects would be temporary and only occur during the construction period. The impacts would benefit the regional economy. Similar to Alternative 1, impacts may be

somewhat less than those presented in Table 20-12 because of lower employee compensation in the three-county region relative to statewide averages used in IMPLAN.

Table 20-12. Annual Total Economic Impacts During Construction of Alternative 4, 2007 Values

Year	Number of Workers	Value of Output, $	Value Added, $	Employment, Jobs
2010	58	$30,119,922	$25,965,450	$8,655,150
2011	174	$17,786,280	$15,333,000	$5,111,000
2012	150	292	252	84
2013	50	$30,119,922	$25,965,450	$8,655,150

20.3 Comparative Analysis of Alternatives

The economic impacts of the action alternatives depend on the amount of time that the recreational facilities at MIAD would be closed and the amount and time of construction labor required for project components. The impacts under each alternative would vary as these factors change. Table 20-13 compares the effects of all alternatives.

Table 20-13. Alternatives Comparison of Economic Effects

Economic Impact Description	No Action/No Project Alternative	Alternative 1 Economic Effects	Alternative 2 Economic Effects	Alternative 3 Economic Effects	Alternative 4 Economic Effects
Reduced recreational spending	No Impact	No Impact, all money would continue to be spent within 3-county regional economy	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Increase economic activity from construction over 2010 to 2013 timeframe	No Impact	Value of Output: $69.9 million Value Added: $41.3 million Employment: 679 jobs	Value of Output: $78.2 million Value Added: $46.2 million Employment: 759 jobs	Value of Output: $74.8 million Value Added: $44.2 million Employment: 726 jobs	Same as Alternative 3

20.4 Cumulative Effects

The cumulative effects analysis considers past, present, and reasonably foreseeable projects occurring concurrently and in proximity to the MIAD Modification Project. The cumulative projects include varying degrees of construction, which similar to the MIAD Modification Alternatives, would provide temporary benefits to the regional economy. The projects would create new jobs and increase output and wages and salaries in the regional economy. Depending on the size and timing of the projects, some construction laborers may need to be hired from outside the region. Laborers hired from outside the region would provide less economic benefits than laborers hired within the

region because they would likely be spending a larger portion of their income outside the region.

The FLSRA will remain open during construction activities of the various cumulative projects. People can continue to visit the sites and purchase goods and services related to their recreation choices. If construction does deter some visitors from the FLSRA, there are a multitude of other recreation alternatives in the area that could be visited. It is expected that people wanting to recreate would spend their money at an alternative recreation site or activity in the 3-county region. Decreased recreational spending would not be substantial under the cumulative condition.

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Chapter 21
Growth Inducing

This chapter analyzes the potential for the MIAD Modification Project to result in growth-inducing impacts. Such impacts normally occur when the proposed project would foster local growth in the economy or the population. Projects that are normally considered to result in growth-inducing impacts are those that provide infrastructure that would support additional growth or remove an existing barrier to growth. The MIAD Modification Project would not result in the creation of new infrastructure that would support additional growth.

Sections 1502.16(b) and 1508.8(b) of the CEQ NEPA regulations require that an EIS analyze direct and indirect impacts of growth-inducing effects. Growth-inducing effects under NEPA are a subset of indirect effects, which are defined as effects "which are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable" (40 CFR1508.8(b)). CEQA regulations also require consideration of the potential for the proposed alternatives to directly or indirectly lead to economic or population growth or the construction of additional housing (Section 15126.2 (d)).

Direct growth-inducing impacts generally stem from the construction of new housing, businesses, or infrastructure. Indirect growth inducement could result if a project establishes substantial new permanent employment opportunities or if it would remove obstacles hindering population growth such as the expansion or the provision of urban services and infrastructure in an undeveloped area. Under CEQA, growth inducement may not necessarily be considered detrimental, beneficial, or of insignificant consequence. Induced growth is considered a significant impact only if it directly (or indirectly) affects the ability of agencies to provide needed public services, or if it can be demonstrated that the potential growth significantly affects the environment.

21.1 Mormon Island Auxiliary Dam Modifications

The proposed alternatives would not result in the construction of additional housing either directly or indirectly. Implementation of the alternatives would not provide new infrastructure such as water systems, energy generation, sewer systems, schools, public services, or transportation improvements that could potentially support increased growth in the region. While construction of the alternatives would generate local economic benefits, this would not be considered permanent employment created by the proposed project and would not result in growth.

The MIAD Modification Project would reduce flood risk for the surrounding area. As noted in the *Folsom Dam Safety and Flood Damage Reduction Project Draft Environmental Impact Statement/Environmental Impact Report* (2006), flood control along the American River consists of many components. Flood damage reduction benefits resulting from the proposed alternatives would not result in any further updates to the FEMA issued Letters of Map Revision (LOMRs) dated February 18, 2005. Development has already occurred in many portions of the American River floodplain despite floodplain designation and costs associated with providing flood insurance in the area. Many residential areas surround Folsom Reservoir and several neighborhoods are located less than one mile from MIAD, suggesting the flood risk at Folsom Reservoir does not currently limit growth. Therefore, increased flood protection would not alter the existing pattern or rate of housing production in the vicinity. Moreover, this type of growth is controlled by local governments and their general plan policies that would not be affected by the proposed MIAD modifications.

The MIAD modifications would not directly or indirectly promote or encourage growth in the surrounding area.

21.2 Mississippi Bar Mitigation Site

The mitigation proposed for Mississippi Bar would not result in direct or indirect growth inducement as it would not create any new housing units, transportation systems, utilities, or services. The Mississippi Bar area contains public lands designated for recreation; the habitat mitigation proposed for Mississippi Bar would not change this designation. Any future recreation development at Mississippi Bar would occur according to the DPR and Reclamation General Plan/Resources Management Plan and would not be attributable to the habitat mitigation proposed for Mississippi Bar.

The Mississippi Bar habitat mitigation would not directly or indirectly promote or encourage growth in the surrounding area.

21.3 References

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Chapter 22
Cumulative Effects and Other Disclosures

This section describes cumulative effects, significant and unavoidable adverse effects, irretrievable and irreversible commitment of resources, and the relationship between short-term uses and long-term productivity for the MIAD Modification Project.

22.1 Cumulative Effects

Cumulative effects are those environmental effects that on their own, may not be considered adverse, but when combined with similar effects over time, result in substantial adverse effects. Cumulative effects are an important part of the environmental analysis because they allow decision makers to look not only at the impacts of an individual proposed project, but the overall impacts to a specific resource, ecosystem, or human community over time from many different projects. This section describes the cumulative effects analysis for the two alternatives proposed in this Supplemental EIS/EIR including the regulatory requirements, the methodology, the projects considered in the analysis, and the potential cumulative effects for each environmental resource.

22.1.1 Regulatory Requirements

Both NEPA and CEQA require consideration of cumulative effects in an EIS or an EIR.

22.1.1.1 National Environmental Policy Act

The CEQ NEPA regulations require an analysis of direct and indirect effects and define "effects" as "… ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative" (40 CFR 1508.8). Additionally, the CEQ NEPA regulations state that when determining the scope of an EIS, cumulative actions must be discussed (40 CFR 1508.25(a)(2)). Cumulative effects are defined under NEPA as " the impact of the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such actions" (40 CFR 1508.7).

22.1.1.2 California Environmental Quality Act

According to Section 15130(a) of the CEQA Guidelines, a lead agency must discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable", that is, when impacts of a project, combined with impacts from other projects, are considered significant. Cumulative impacts are defined in the CEQA Guidelines as:

"…two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

(a) The individual effects may be changes resulting from a single project or a number of separate projects.

(b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (CEQA Guidelines Section 15355).

22.1.2 Methodology

CEQA Section 15130 identifies two methods that can be used to develop the cumulative condition and an analysis of cumulative impacts:

1. "A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the lead agency," or

2. "A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or areawide conditions contributing to the cumulative impact."

The cumulative analysis for the MIAD Modification Project evaluates cumulative actions described through a combination of both CEQA methods identified above. For instance, cumulative effects associated with transportation and circulation mainly uses the projection method (#2) while the majority of the other resources use the project method (#1). These methods are also consistent with CEQ Regulations for Implementing NEPA.

22.1.3 Projects Considered in Cumulative Effects Analysis

Several past, present, and reasonably foreseeable project have been considered in the cumulative analysis and are presented in Table 22-1 below. Following the table is a brief description of each of the cumulative projects.

Table 22-1. Cumulative Projects

Project	Implementing Agency	Description	Status	Resources Affected
Raw Water Bypass Pipeline Project	San Juan Water District, City of Roseville, Reclamation	Construction of a raw water bypass pipeline below Right Wing Dam parallel to Reclamation's existing 84-inch diameter pipeline	Start date: Fall 2009 End date: Summer 2010	Traffic, Air Quality, Biological Resources, Recreation
Central California Area Office Building Replacement Project	Reclamation	Removal of several existing buildings and construction of a new Maintenance Center and Administration Building at Reclamation's Central California Area Office	Phase 1 start date: Fall 2009 Phase 2 start date: 2011	Noise, Air Quality, Biological Resources
New Folsom Bridge (Folsom Crossing)	Corps	New bridge connecting Auburn-Folsom Road to East Natoma Street.	Completed: March 2009	Traffic, Noise
Widening of Green Valley Road	City of Folsom	Widening Green Valley Road from two to four lanes	Unknown: Pending completion of MIAD work	Biological Resources
Lower American River Salmonid Spawning Gravel Augmentation and Sidechannel Habitat Establishment Program (Gravel Augmentation Program)	Reclamation	Obtaining gravel from dredge tailings at Mississippi Bar for use in fish habitat enhancement on the Lower American River	Anticipated start date: Summer 2009	Traffic, Noise, Biological Resources
Dike 4 Static Upgrades	Reclamation	Replacement of filters and drains	Construction start date: Unknown	Traffic, Noise, Air Quality
Gates, tendons, and piers for Main Concrete Dam	Reclamation	Seismic upgrades to Main Concrete Dam	Anticipated start date: 2010	Traffic, Noise, Air Quality
Phase II of Joint Federal Project Auxiliary Spillway	Reclamation	Lower portion of excavation for the Auxiliary Spillway	Construction start date: Summer 2009	Traffic, Noise, Air Quality
Phase III of Joint Federal Project Auxiliary Spillway	Corps	Control Structure, Spillway Chute/Stilling Basin, and Approach Channel	Construction start date: November 2010	Traffic, Noise, Air Quality

22.1.3.1 Raw Water Bypass Pipeline Project

The Raw Water Bypass Pipeline Project is being carried out by Reclamation, San Juan Water District (SJWD), and the City of Roseville, to ensure water deliveries during maintenance of an existing 84-inch diameter raw water pipeline that serves the SJWD and Roseville water treatment plants. The 84-

inch diameter above-ground pipeline is the only pipeline that conveys Folsom Reservoir water to SJWD and Roseville water treatment plants and requires maintenance to repair joints and the interior lining. The project would occur on Federal property at Folsom Reservoir and includes construction of a buried 72-inch diameter raw water bypass pipeline that would extend from the existing pump station (Folsom Pumping Plant) below Right Wing Dam to the Hinkle Wye. A 60-inch diameter buried pipeline would also be constructed to connect the new 72-inch pipeline to two existing parallel transmission mains operated by the City of Roseville. This project is expected to start construction in fall 2009.

During peak construction (approximately 5 weeks), 48 dump trucks (96 total trips), 20 construction worker vehicles (40 round trips), and 9 trucks delivering various materials (18 total trips) are expected. Most materials would be delivered to the site from Auburn-Folsom Road to Reclamation's Central California Area Office (CCAO) entrance road. Other impacts of this project include a temporary detour of the American River Bike Trail, temporary closure of one lane of the entrance road to the CCAO Office (within Federal property), and potential vegetation and wildlife effects (Reclamation and San Juan Water District 2009).

22.1.3.2 Central California Area Office Building Replacement Project

The CCAO Building Replacement Project involves the replacement of existing maintenance and administrative facilities at Reclamation's CCAO Headquarters in Folsom, California. Two new buildings would be constructed, a Maintenance Center and an Administration Building. The new buildings would be sited to work with existing topography, paved areas, and roads to minimize earthwork, demolition, and construction costs. Ample space would be provided for access of firefighting equipment. Approximately 15 existing buildings and trailers of various sizes would need to be removed prior to construction. Two new parking lots would be created to support Reclamation staff and visitors at the Administration Building, and the access road to the Maintenance Center would be re-graded and paved to meet current Caltrans standards. The project would be implemented in two phases, with Phase 1 including construction of the Maintenance Center and Phase 2 including construction of the Administration Building (Reclamation 2009).

22.1.3.3 New Folsom Bridge (Folsom Lake Crossing)

The Corps completed the new Folsom Bridge in March 2009. This bridge replaces Folsom Dam Road which was closed to the public after September 11th due to security concerns. The new bridge links Auburn-Folsom Road to East Natoma Street and has been named "Folsom Lake Crossing". This new bridge has been considered in the cumulative effects analysis as it a new source of noise and traffic. It was not complete at the time of the Folsom DS/FDR Project EIS/EIR.

22.1.3.4 Widening of Green Valley Road

The City of Folsom plans to widen Green Valley Road from two to four lanes. There is currently no environmental compliance documentation and no construction schedule for the project. The City has been actively coordinating with Reclamation and recognizes that the MIAD work will need to be completed before they can begin to widen the road. Due to the presence of the MIAD overlay proposed in this document, it is assumed that the road would be widened by extending it south, potentially into the Mormon Island Wetland Preserve area.

22.1.3.5 Lower American River Salmonid Spawning Gravel Augmentation and Sidechannel Habitat Establishment Program

Reclamation is planning to obtain gravel from Reclamation property at Mississippi Bar to enhance fish habitat and spawning grounds in the American River. The gravel would be obtained from mine tailings on the Reclamation-owned portion of Mississippi Bar, washed using an on-site well on DPR property, and transported off-site to the Lower American River. These efforts may coincide with the habitat mitigation proposed for Mississippi Bar.

22.1.3.6 Folsom Dam Safety and Flood Damage Reduction Project Ongoing Construction Activities

Several Folsom DS/FDR activities could be occurring at Folsom Reservoir during the MIAD modifications, including static upgrades to Dike 4, seismic upgrades (piers and tendons) to the Main Concrete Dam, Phase II and Phase III of the JFP Auxiliary Spillway.

22.1.4 Cumulative Effects

A cumulative impact analysis has been completed for each individual resource and can be found in Chapters 4 through 21. This section summarizes cumulative effects for each environmental resource.

22.1.4.1 Hydrology, Water Quality, and Flood Control

Construction of the MIAD Modification Project would result in increased dam safety and flood damage reduction. This impact would be beneficial to the surrounding urban areas. The other remaining components of the Folsom DS/FDR Project have the potential to collectively increase the flood damage reduction through additional improvements. These projects would culminate in beneficial cumulative impacts for flood damage reduction and dam safety.

Construction of the MIAD Modification Project, in combination with existing and probable future projects, could affect hydrology and water quality. This cumulative impact would be significant but mitigation measures would reduce these impacts to a less than significant level. When combined with construction of the cumulative projects described in Table 22-1, there is a possibility that water resources would be affected. However, each project's associated SWPPPs, BMPs, pertinent permits, and appropriate monitoring and testing

would ensure that measures are implemented to avoid hydrologic resource impairment including water quality degradation and detrimental effects to wetlands. This would result in effective mitigation of any potentially significant cumulative impacts.

22.1.4.2 Groundwater

There are no other known groundwater extraction projects in the vicinity of the MIAD that when added to the MIAD dewatering would create a greater significant impact. Given that the MIAD dewatering action is temporary and mitigation for wetlands impacts is being considered, no cumulative impacts are probable to groundwater resources.

22.1.4.3 Air Quality

Construction of the projects listed in Table 22-1 would increase emissions of criteria pollutants from onsite construction and transport of materials. The combination of the significant emissions from the MIAD Modification Project and emissions from the other cumulative projects at Folsom Reservoir and surrounding areas would contribute to cumulatively significant air quality impacts. These cumulative impacts would be significant and unavoidable because they would occur even after all feasible mitigation has been implemented.

22.1.4.4 Biological Resources

Vegetation and Wildlife The Raw Water Bypass Pipeline Project, CCAO Building Replacement Project, the Green Valley Road Widening Project, and the MIAD Modifications Project are all expected to result in impacts to vegetation and wildlife, including wetlands. However, each project will implement mitigation measures to reduce effects on vegetation and wildlife to less-than-significant levels. Therefore, the implementation of the MIAD Modification Project, along with the Raw Water Bypass Pipeline Project, CCAO Building Replacement Project, and the Green Valley Road Widening Project would not result in cumulatively considerable impacts with implementation of proper mitigation.

Special-Status Plant Species The Raw Water Bypass Pipeline Project will not affect special-status plant species. The CCAO Building Replacement Project, the Green Valley Road Widening Project, and MIAD Modifications Project may result in impacts to special-status plant species. However, each project will implement mitigation measures to reduce effects on special-status plant species to less-than-significant levels. Therefore, implementation of the MIAD Modifications Project, along with the CCAO Building Replacement Project and the Green Valley Road Widening Project would not result in cumulatively considerable impacts.

Special-Status Wildlife Species The Raw Water Bypass Pipeline Project, CCAO Building Replacement Project, the Green Valley Road Widening

Project, and the MIAD Modifications Project are all expected to result in impacts to special-status wildlife species. However, each project will implement mitigation measures to reduce effects on special-status wildlife species to less-than-significant levels. Therefore, the implementation of the MIAD Modification Project, along with the Raw Water Bypass Pipeline Project, CCAO Building Replacement Project, and the Green Valley Road Widening Project would not result in cumulatively considerable impacts.

Overall, the effects of these projects in combination with the MIAD Modification Project would not be cumulatively considerable for any specific biological resources.

22.1.4.5 Soils, Geology, and Mineral Resources

Table 22-1 presents the list of cumulative projects considered in the cumulative analysis. Although the construction activities associated with the MIAD Modification Project would involve a substantial amount of soil and material displacement, the potential for landslides within the study area is low and construction techniques would be implemented to minimize the potential for landslides. No other cumulative projects would have the potential to induce landslides in the project area. There would be no cumulative effects associated with landslides.

Although the construction of the MIAD Modification Project would involve a substantial amount of soil moving activities, impacts associated with soil erosion and loss of topsoil would be mitigated. Other projects in the vicinity, including other Folsom DS/FDR activities, the CCAO Building Replacement Project, and the Bypass Pipeline Project could all result in loss of topsoil and erosion. These projects and the MIAD Modification Project would be responsible for mitigating their effects. Any cumulative effects associated with loss of topsoil resources would be less than significant with proper mitigation by project proponents.

Construction activities for the MIAD Modification Project could expose asbestos-bearing materials through stripping and excavation as well as through the use of staging/processing areas and movement of large construction equipment. No other projects besides the JFP are expected to complete construction in the areas with naturally-occurring asbestos. Both the MIAD Modification Project and the JFP are required to submit and implement a Dust Mitigation Plan to minimize the impacts. Implementation of the Dust Mitigation Plan would reduce any impacts associated with asbestos. Cumulative impacts for naturally-occurring asbestos would be less than significant.

Construction activities associated with the MIAD Modification Project would not result in any significant cumulative effects on soils, minerals, and geological resources.

22.1.4.6 Visual Resources

The only project with the potential to have cumulative impacts on visual resources in the vicinity of MIAD is the Green Valley Road Widening Project. The Green Valley Road Widening Project is a project being planned by the City of Folsom to widen Green Valley Road from two to four lanes. It is assumed that the road would be widened south of its existing location, into the Mormon Island Wetland Preserve. This would presumably affect portions of the Mormon Island Wetland Preserve. When taken into consideration with the effects of the MIAD Modification Project's impacts to wetlands through temporary relocation of the road and the potential reduction in the water source for the wetlands, this could lead to a cumulatively significant visual impact if all projects result in vegetation loss. While Reclamation and the City of Folsom would mitigate for the impacts to wetlands according to current wetland regulations, they may have to mitigate off-site. If this is the case, the visual impacts could be cumulatively significant and unavoidable.

22.1.4.7 Transportation and Circulation

Several of the projects include construction within the project area that will require transport of materials to and from Folsom Reservoir. In addition, population is increasing in the region, which will further increase traffic congestion in the study area. Modeling results for the MIAD Modification Project alternatives suggest that there is a potential for the alternatives to contribute to significant cumulative impacts on transportation and circulation at select roads from increased trip generation. Other cumulative projects will also have the potential for significant cumulative transportation and circulation effects should construction activities occur concurrently. To minimize these impacts, Reclamation and its construction contractor will monitor for traffic problems at the identified locations and adjust travel schedules and sequencing accordingly. Reclamation will also coordinate with other ongoing construction projects to minimize traffic congestion. Overall, cumulative traffic impacts would be less than significant.

22.1.4.8 Noise

Table 22-1 presents the projects that were considered in the analysis of cumulative effects. Construction of these projects could increase construction noise; however, all projects would be responsible for mitigating noise to less than significant levels. Furthermore, the MIAD Modification Project is not expected to result in significant impacts of noise after implementation of mitigation measures. Since all projects will mitigate noise impacts, the cumulative effects would not be significant.

22.1.4.9 Cultural Resources

Table 22-1 presents the projects that were considered in the analysis of cumulative effects. In addition to these projects, continued county, municipal, and private development in the region surrounding Folsom Reservoir is also considered in this analysis. Non-Federal development in the surrounding region has resulted in impacts to historic and prehistoric resources.

For some Federal cumulative projects, the impacts on historic properties would not be known until further site-specific historic resource studies have been undertaken, project designs have been more fully developed, and projects implemented. For Federal projects, the lead Federal agency would carry out any necessary inventories and evaluations of NRHP significance; consultation with the SHPO and Native American groups and interested parties; and treatment/mitigation required by Section 106 of the NRHP.

Cultural resources have been affected by past actions since Folsom Dam was constructed in 1956. Identified resources could be subject to damage from ongoing maintenance, new construction, demolition, rehabilitation of existing facilities, and natural processes (e.g. wave erosion). Alternatives 1 through 4 have the potential to contribute to the loss of regional cultural resources as a consequence of disturbance or degradation of previously undiscovered archaeological sites. To mitigate adverse impacts, important information contained in affected resources would be recovered by treatment and mitigation required by Section 106 of the NRHP and Reclamations Directives and Standards LND P01, LND-02, and LND 10-01.

Private development in El Dorado and Sacramento Counties may lead to incremental adverse impacts to cultural resources. However, provided that proper mitigation consistent with Section 106 of the NHPA for Federal actions and CEQA for State, county and municipal actions, is implemented in conjunction with development of related projects in these counties and the surrounding region, no significant cumulative impacts are anticipated.

22.1.4.10 Land Use, Planning, and Zoning

The projects identified in Table 22-1 would not affect land use or zoning in the area around MIAD, with the exception of the widening of Green Valley Road, which would affect an existing easement held by the City of Folsom. Reclamation is aware of this future project and has been coordinating MIAD work with the City of Folsom. Work on the road widening project would not begin until after MIAD modifications have been completed to ensure the road widening does not encroach upon the MIAD foundation and overlay. The temporary relocation of Green Valley Road during the MIAD work would have no permanent land use effects as it would be restored to its previous condition after construction. There are no cumulative projects that would affect land use at Mississippi Bar. Therefore, the cumulative effect of the MIAD Modification Project actions and the projects presented in Table 22-1 would be less than significant.

22.1.4.11 Recreation

Alternative 1 of the MIAD Modification Project would require temporary relocation of the road into the Mormon Island Wetland Preserve and would likely reduce access for the length of construction. After construction is complete, the area would be restored to its previous condition. The Green

Valley Road Widening Project would involve widening Green Valley Road from two lanes to four lanes. Because the road could not be widened north as it would encroach upon the MIAD overlay, it is expected to be widened south, presumably into the Mormon Island Wetland Preserve. This could permanently reduce recreation. While this project could have a cumulative effect on recreation at the preserve, the MIAD Modification Project impacts would only be temporary. The City of Folsom would be responsible for mitigating their project's impacts. No cumulative impacts are expected to recreation at the preserve.

Reclamation's Gravel Augmentation Program would be occurring during mitigation development at Mississippi Bar. The Gravel Augmentation Program involves harvesting, washing, and transporting gravel and may require fencing during construction. The fencing would occur in an area that is not highly visited by recreationists as it contains mine tailings. The MIAD Modification Project actions at Mississippi Bar would involve temporary restrictions to recreation during construction and plant establishment; however after the plants are established no recreation restrictions are expected. Additionally, several actions at Mississippi Bar would increase the potential for aquatic recreation. The MIAD Modification Project is not expected to result in cumulative recreation impacts at Mississippi Bar.

22.1.4.12 Public Services and Utilities

No cumulative projects in the area of analysis would have the potential to affect the PG&E gas line beneath Green Valley Road; therefore, there would be no cumulative impacts to this utility. No other cumulative impacts are expected to public services and utilities.

22.1.4.13 Public Health and Safety

There is a potential for adverse cumulative impacts related to public safety, as several construction projects listed in Table 22-1 would occur near recreational areas. In addition, there is potential for cumulative impacts associated with hazardous materials, as many of the projects listed in Table 22-1 involve ground-disturbing construction that may encounter naturally occurring asbestos, mercury, and arsenic. Finally, the potential also exists for cumulative impacts associated with wildland fires started by the various ongoing construction projects in the area.

Concurrent projects would be required to comply with Federal, State, and local laws and regulations related to hazardous materials. The MIAD Modification Project would implement mitigation measures outlined in Chapter 16, Section 16.4, to ensure that potential cumulative impacts related to public health and safety would be less than significant. All other cumulative projects would be responsible for implementing their own public health and safety measures. With the mitigation measures described in Chapter 16, Section 16.4, the project would not contribute to any significant cumulative impacts.

22.1.4.14 Indian Trust Assets

The MIAD Modification Project would have no ITA impacts and would not contribute to any cumulative ITA impacts.

22.1.4.15 Environmental Justice

The MIAD Modification Project would have no environmental justice impacts and would not contribute to any cumulative environmental justice impacts.

22.1.4.16 Climate Change

Many of the projects include construction within the surrounding region. Construction of these projects would increase emissions of GHG pollutants from onsite construction and transport of materials. Each project would need to mitigate individual climate change effects, which would decrease overall cumulative effects. However, without consideration of scheduling and sequence of activities, concurrent construction projects within and adjacent to MIAD would have significantly increased GHG emissions.

22.2 Significant and Unavoidable Adverse Effects

Significant and unavoidable adverse effects refer to the environmental consequences of an action that cannot be avoided by redesigning the project, changing the nature of the project, or implementing mitigation measures. NEPA regulations require a discussion of any adverse impacts that cannot be avoided (40 CFR 1502.16). CEQA Guidelines (Section 15126.2 (b)) require a discussion on significant environmental effects that cannot be avoided and those that can be mitigated but not reduced to an insignificant level. This section discusses significant and unavoidable impacts of the proposed alternatives for the MIAD Modification Project.

22.2.1 Air Quality

Daily emissions of NO_X would exceed the SMAQMD's threshold of significance for CEQA for all four alternatives, even with all feasible mitigation. The SMAQMD will allow the project to proceed if a required mitigation fee ($16,000 per ton of emissions plus 5 percent administrative costs) is paid. This air quality impact would be significant and unavoidable for all four alternatives.

Annual emissions of NO_X exceed the general conformity thresholds for three of the alternatives (Alternatives 1, 3, and 4) even with all feasible mitigation. Implementation of any of these three alternatives would result in significant and unavoidable air quality impacts.

The combination of the significant emissions from the MIAD Modification Project and emissions from the other cumulative projects at Folsom Reservoir and surrounding areas would contribute to cumulatively significant air quality impacts. These cumulative impacts would be significant and unavoidable because they would occur even after all feasible mitigation has been implemented.

22.2.2 Recreation

Alternative 1 would result in potentially significant and unavoidable impacts to recreation at Mormon Island Wetland Preserve for the duration of construction. Green Valley Road would need to be temporarily relocated up to 250 feet south of its current location, temporarily closing most of Mormon Island Wetland Preserve. After construction is complete, the area, including all trails, would be restored and there would be no impact.

22.2.3 Visual Resources

Alternative 1 would result in potentially significant and unavoidable visual impacts for the duration of construction. Green Valley Road would need to be temporarily relocated south into the Mormon Island Wetland Preserve. This would result in the loss of vegetation and would have significant and unavoidable impacts to views from Green Valley Road. Once construction is complete, the area would be restored and revegetated.

22.3 Irreversible and Irretrievable Commitment of Resources

According to NEPA, an EIS must contain a discussion of irreversible and irretrievable commitment of resources that would result from the proposed action if it was implemented (40 CFR 1502.16). The irreversible commitment of resources generally refers to the use or destruction of a resource that cannot be replaced or restored over a long period of time. The irretrievable commitment of resources refers to the loss of production or use of natural resources and represents lost opportunities for the period when the resource cannot be used. CEQA also requires a discussion of any significant effect on the environment that would be irreversible if the project is implemented or would result in an irretrievable commitment of resources [14 CCR 15126(c); 14 CCR 15126.2(c)].

Construction activities would involve the consumption of nonrenewable natural resources such as the earthen material, concrete, processed material, and petroleum for fuel. The resources used in site preparation, construction material transportation, excavation, shell and filter placement, and toe drain placement would be permanently committed to the alternative. In addition, continued operation and maintenance of the completed alternative would use petroleum for fuel and potentially soil and concrete.

22.4 Relationship Between Short-Term Uses and Long-Term Productivity

As required by NEPA (40 CFR 1502.16), this section describes the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity.

All four action alternatives involve dam safety measures to modify the foundation of MIAD. These would include short-term uses of capital, labor, fuels, and construction materials, and the use of existing habitats and recreation areas for construction and staging. General construction material resource commitments would be largely irreversible, since most of the construction materials are unsalvageable. The labor and fuel used in the construction and operation of the MIAD Modification Project would be irretrievable. Habitat and recreation area losses during construction activities and would be recommitted as habitat and recreation areas or mitigated elsewhere.

Each of the alternatives would benefit long-term productivity in the Sacramento region because they would reduce the potential for flood-related loss of resources, property, and human life.

22.5 References

Bureau of Reclamation (Reclamation). 2009. *Central California Area Office Building Replacement Project Draft Environmental Assessment and Draft Finding of No Significant Impact, January 2009.*

Reclamation and San Juan Water District. 2009. *Raw Water Bypass Pipeline Project Final Environmental Assessment/Initial Study, June 2009.*

Council on Environmental Quality (CEQ). 1997. *Consideration of Cumulative Effects under the National Environmental Policy Act*.

Council on Environmental Quality Regulations for Implementing NEPA. Code of Federal Regulations (CFR), Title 40, Chapter 5, Section 1500-1508.

California Environmental Quality Act (CEQA) Guidelines, California Code of Regulations (CCR), Title 14, Division 6, Chapter 3, Section15000 et seq.

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Chapter 23
Consultation and Coordination

This chapter documents the consultation and coordination efforts that have occurred during development of the MIAD Modification Project Supplemental EIS/EIR.

23.1 Public Involvement

Both NEPA and CEQA encourage public involvement during preparation of EISs and EIRs. The following sections describe the public involvement opportunities that have occurred or will occur during the EIS/EIR process.

23.1.1 Public Scoping

In December 2008, Reclamation published a Notice of Intent in the Federal Register and held three public scoping meetings to solicit input on the MIAD Modification Project. Two meetings were held in the City of Folsom and one was held in El Dorado Hills. In addition to the meetings, Reclamation accepted written comments during the 30 day comment period. The results of these scoping meetings, including comments and concerns raised during the meetings, as well as public comments obtained during the public comment period, are presented in the *Mormon Island Auxiliary Dam Modification Project Scoping Meeting Summary Report, 2009* (See Appendix A). SAFCA published a Notice of Preparation in the State Clearinghouse in April 2009 and collected comments during a 30 day comment period. Copies of all CEQA scoping comments are also provided in Appendix A.

23.1.2 Public Meetings and Comments on the Draft Supplemental Environmental Impact Statement/Environmental Impact Report

This document has been released to the public for 45 days of review and comment, as required by NEPA and CEQA. Public meetings will be held for the Draft Supplemental EIS/EIR in December 2009 and comments on the Draft Supplemental EIS/EIR will be accepted at the meetings as well as throughout the public comment period.

23.2 Agency Coordination

The development of the MIAD Modification Project has required coordination with a variety of Federal, State, and local agencies. The following sections describe these agencies and their roles in the process.

23.2.1 U.S. Fish and Wildlife Service

Reclamation has been coordinating with the USFWS to ensure compliance with ESA and the FWCA. Reclamation initiated consultation with USFWS in October 2009 and will amend the existing Folsom DS/FDR Biological Opinion and Coordination Act Report to include any new impacts that would occur from the MIAD Modification Project, as necessary. The USFWS will receive a copy of the Draft Supplemental EIS/EIR for review.

23.2.2 U.S. Army Corps of Engineers

The MIAD Modification Project addresses only Dam Safety issues; therefore the Corps is not a partner for this document. However, the MIAD Modification Project does have the potential to impact wetlands and Reclamation has been coordinating with the Corps Regulatory Division regarding updates and amendments to the existing Folsom DS/FDR CWA Section 404 permit.

The MIAD Modification Project may overlap with Phase III of the JFP Auxiliary Spillway, which is being completed by the Corps. Reclamation and the Corps have been meeting regularly to coordinate these construction activities. The Corps will receive a copy of the Draft Supplemental EIS/EIR for review.

23.2.3 California Department of Parks and Recreation

DPR manages the lands surrounding Folsom Reservoir as part of the FLSRA. Additionally, DPR owns half of the land at Mississippi Bar and may need to enter into an agreement with Reclamation to allow access to the site if it is used to fulfill habitat mitigation requirements. Reclamation has been meeting regularly with DPR to discuss the habitat mitigation plans for Mississippi Bar and the potential impacts to recreation from MIAD construction. DPR will receive a copy of the Draft Supplemental EIS/EIR for review.

23.2.4 State Historic Preservation Office

The MIAD Modification Project requires compliance with Section 106 of the NHPA of 1966 (as amended in 1992) that requires Federal agencies to consult with the ACHP concerning potential effects of Federal actions on historic properties. Reclamation will complete SHPO consultation prior to construction.

23.2.5 Central Valley Regional Water Quality Control Board

The MIAD Modification Project could require several permits from the CVRWQCB including a dewatering permit and a NPDES permit for General Construction. Reclamation has been consulting with the CVRWQCB to determine the correct permits and their requirements. Reclamation and the construction contractor will obtain these permits prior to construction. The CVRWQCB will receive a copy of the Draft Supplemental EIS/EIR for review.

23.2.6 Sacramento Metropolitan Air Quality Management District/El Dorado County Air Quality Management District

The MIAD Modification Project is required to submit a dust mitigation plan to mitigate for potential impacts associated with naturally occurring asbestos. This dust plan must be approved by both SMAQMD and EDCAQMD. Reclamation's construction contractor will be responsible for submitting the plan and obtaining the required approvals. SMAQMD and EDCAQMD will receive a copy of the Draft Supplemental EIS/EIR for review.

23.2.7 City of Folsom

The MIAD Modification Project has the potential to impact Green Valley Road, a local road under the jurisdiction of the City of Folsom. Reclamation has held several meetings with the City of Folsom to discuss the temporary relocation of the road and the City's existing easement. The City of Folsom will receive a copy of the Draft Supplemental EIS/EIR for review.

23.3 Project Management and Technical Teams

Many management and technical teams studied and reviewed the construction and environmental impacts of the MIAD Modification Project. These teams included representatives from multiple agencies.

- PMT – Project Management Team
- PDT – Project Development Team
- PMG – Project Management Group
- OMG – Oversight Management Group
- PASS Team - Project Alternative Solutions Study Team
- PASS II Team - Project Alternative Solutions Study II Team
- Mitigation and Monitoring Team

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Chapter 24
Document Availability and List of Recipients

This chapter describes the locations where copies of this Draft Supplemental EIS/EIR have been made available for viewing. It also lists the Federal, State, regional and local agencies and organizations that have received either a copy of this document or a notification of the document's availability.

24.1 Document Availability

The Draft Supplemental EIS/EIR will be made available for review and comment for a minimum of 45 days following filing of the Notice of Availability of the EIS with the USEPA and the Notice of Completion of the EIR with the California State Clearinghouse.

The purpose for public review of the Draft Supplemental EIS/EIR is to receive comments from interested parties on its completeness and adequacy in disclosing the environmental effects of the proposed project. Following the close of the Draft Supplemental EIS/EIR public review period, a second document containing comments received on the Draft Supplemental EIS/EIR and responses to the significant environmental points raised in those comments, will be prepared and published. Together, the Supplemental EIS/EIR and the responses to comments will constitute the Final EIS/EIR. Reclamation is responsible for adopting the EIS as adequate in compliance with the NEPA and SAFCA is responsible for certifying the EIR as adequate in compliance with CEQA. After the Final Supplemental EIS/EIR is complete, the agencies will consider the Supplemental EIS/EIR when making their decision to approve or not approve the MIAD Modification Project. If the project is approved, Reclamation will complete a ROD according to NEPA. SAFCA will issue a Notice of Determination and a Statement of Findings according to CEQA.

Hard copies of this document have been made available for viewing at the libraries listed in Subsection 24.1.1. An electronic version of the document can be viewed at Reclamation's website listed in Subsection 24.1.2. To request a copy of the Draft Supplemental EIS/EIR, please contact:

Matthew See
Natural Resource Specialist
Bureau of Reclamation
7794 Folsom Dam Road
Folsom, CA 95630

Phone: (916) 989-7198
E-mail: msee@usbr.gov
Fax: (916) 989-7208

24.1.1 Libraries

Copies of this Draft Supplemental EIS/EIR are available for public review at the following libraries:

- Bureau of Reclamation, Mid-Pacific Regional Office Library, 2800 Cottage Way, W-1825, Sacramento, CA 95825-1898
- El Dorado County Library, 345 Fair Lane, Placerville, CA 95667-5699
- Folsom Public Library, 300 Persifer Street, Folsom, CA 95630
- Natural Resources Library, U.S. Department of the Interior, 1849 C Street NW, Main Interior Building, Washington, DC 20240-0001
- Roseville Public Library, 311 Vernon Street, Roseville, CA 95678
- Sacramento Central Library, 828 I Street, Sacramento, CA 95814-2589

24.1.2 Project Website

This Draft Supplemental EIS/EIR is available in electronic format on Reclamation's website:
http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=1808

24.2 List of Recipients

Various elected officials and representatives, government departments and agencies, private organizations and businesses, and members of the public have received a copy of this Draft Supplemental EIS/EIR or a notification of document availability.

24.2.1 Elected Officials and Representatives

Governor of California
Honorable Arnold Schwarzenegger

United States Senate
Honorable Barbara Boxer

House of Representatives
Honorable Dan Lungren
Honorable Doris Matsui
Honorable Tom McClintock

California Senate
Honorable Dave Cox

California Assembly
Honorable Roger Niello

24.2.2 Government Departments and Agencies

24.2.2.1 U.S. Government

Advisory Council on Historic Preservation
Army Corps of Engineers
Bureau of Land Management
Bureau of Reclamation
Council on Environmental Quality
Environmental Protection Agency
Federal Emergency Management Agency
Fish and Wildlife Service
Geological Survey
National Marine Fisheries Service
Office of Environmental Project Review
Western Area Power Administration

24.2.2.2 State of California

Air Resources Board
California Water Commission
Central Valley Regional Water Quality Control Board
Department of Conservation
Department of Corrections
Department of Fish and Game
Department of Parks and Recreation
Department of Transportation
Department of Water Resources
Native American Heritage Preservation
Office of Transportation Planning
Office of Historic Preservation
Central Valley Flood Protection Board
State Clearinghouse
State Lands Commission
Water Resources Control Board

24.2.2.3 Regional, County, and City

City of Folsom
El Dorado County
Granite Bay Advisory Council
El Dorado County Air Pollution Control District
Placer County
Sacramento County
Sacramento Area Flood Control Agency
Sacramento Metropolitan Air Quality Management District

24.2.3 Private Organizations and Businesses

SARA – Save the American River Association
Friends of the River
LARTF – Lower American River Task Force
Brother Boats
Sporting Edge Ski and Marine
Folsom Lake Yacht Club

24.2.4 Members of the Public

Reclamation continues to update a project mailing list that currently contains over 2,000 names and addresses. In addition to the regulatory agencies, agencies with special expertise or interest in evaluating environmental issues related to the project are included. Private agencies, organizations, and individuals who may be affected by the project or who have expressed an interest in the project through the public involvement process are also included. Notifications of document availability have been mailed out to all those on the project mailing list. All members of the public that submit comments on this document will be added to the mailing list and will receive future notifications.

Chapter 25
List of Preparers

This chapter lists the authors of this document and those who contributed information during the development of the document.

Name/Professional Discipline	Expertise and Experience	Role in Preparation
Bureau of Reclamation Preparers		
Larry Hobbs Safety of Dams Project Manager	15 years of project development experience	Project Description, Document Review
Elizabeth Vasquez Natural Resource Specialist	8 years of natural resources experience	Project Description, Document Review
Matthew See Natural Resource Specialist	4 years of natural resources experience	Project Description, Document Review
Sacramento Area Flood Control Agency Preparers		
Pete Ghelfi	20 years of experience in civil engineering	Project Description, Document Review
Tim Washburn	20 years of legal and planning experience	Project Description, Document Review
CDM Preparers		
John Wondolleck Associate	33 years of experience in resource development, toxic substance releases, and environmental planning	EIS Project Manager, Technical Direction, Document Preparation, and Review
Hank Boucher Associate	30 years of experience as an environmental engineer and planner with expertise in impact assessment, planning, transportation, and land use development	Noise, Technical Review
Stacy Porter Environmental Planner	5 years of experience in water resources planning and environmental compliance	EIS/EIR Task Leader, Introduction, Project Description, Cumulative Effects, Public Utilities, Geology and Soils
Gina Veronese Environmental Planner	8 years experience in resource economics and environmental compliance	Economics, Recreation
Patricia Reed Environmental Scientist	10 years experience in natural resources	Biological Resources VELB Surveys, Wetland Delineation
Sean Murphy Civil Engineer	3 years of experience in traffic modeling and analysis	Transportation and Circulation
Gwen Pelletier Environmental Scientist	8 years of experience working on air quality projects and compliance	Air Quality, Climate Change, Noise

Name/Professional Discipline	Expertise and Experience	Role in Preparation
Charles Kincaid Senior Transportation Manager	27 years experience in transportation planning , design and construction for highway and bridge projects	Transportation and Circulation
Margaret Bloisa Hydrogeologist	20 years experience in groundwater studies	Groundwater
Chris Park Environmental Planner	4 years of experience in water resources planning and environmental compliance	Water Quality, Hydrology, and Flood Control
Robert Saikaly Scientist	6 years experience conducting noise assessments for NEPA and DOE road improvement projects	Noise
Asami Tanimoto Junior Engineer	2 years of experience working on air quality and GHG projects	Air Quality, Climate Change
Alexandra Kleyman Environmental Planner	2 years of experience in environmental planning and NEPA/CEQA analyses	Growth Inducing, Visual Resources
Brian Heywood Water Resources Engineer	12 years of experience in groundwater and water resources projects	Groundwater
Jennifer Jones Environmental Scientist	Over 16 years of experience as a land use and environmental planner.	Biological Resources, Public Health and Safety
Suzanne Wilkins Environmental Engineer	12 years experience in water resource consulting	Land Use, Planning, and Zoning, Environmental Justice, Indian Trust Assets
Julie Hinchcliff Administrative Assistant	30 years of word processing and production experience	Word Processing and Production
Juan Tijero Lead Graphic Designer	13 years of experience in graphic design	Graphics
Pacific Legacy Preparers		
John Holson Pacific Legacy Senior Archaeologist	30 years of experience in cultural resources management	Cultural Resources
Hannah Ballard Senior Historical Archaeologist	16 years experience in cultural resources management	Cultural Resources
Melinda McCrary Archaeological Technician	5 years experience in cultural resources management	Cultural Resources

List of Contributors		
Michael Finnegan Bureau of Reclamation	Drew Lessard Bureau of Reclamation	Robert Shroeder Bureau of Reclamation
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Nathan Snorteland Bureau of Reclamation	Patricia Rivera Bureau of Reclamation	Stephanie Rickabaugh U.S. Fish and Wildlife Service
Michael Nepstad Bureau of Reclamation	Lisa Gibson U.S. Army Corps of Engineers	Sidney Jones U.S. Army Corps of Engineers
Jim Micheaels California Department of Parks and Recreation	Sally Walters California Department of Parks and Recreation	

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Chapter 26
Glossary

Term	Definition
abatement	Reduction or decrease in amount, degree, intensity or worth.
abutment	The part of a dam that contacts the riverbank.
access easement	Grants the right of access.
acre-foot (AF)	The volume of water that would cover 1 acre to a depth of 1 foot, or 325,851 gallons of water. On average, 1 acre-foot could supply one to two households with water for a year. A flow of 1 cubic foot per second for a day is approximately 2 acre-feet.
aesthetic	A term that denotes those properties of an entity that appeal to the senses.
air district	A political body responsible for managing air quality on a regional or county basis. California is divided into 35 air districts.
alkalinity	Alkalinity is a measure of the capacity of water to neutralize acids and is also known as the buffering capacity.
alluvial soils	Soils deposited through the action of moving water. These soils lack horizons and are usually highly fertile.
alternative	A collection of actions or action categories assembled to provide a comprehensive solution to problems.
ambient	1) The existing or background air, soil, water, or plant quality in a given community. 2) The allowable amount of materials, as a concentration of pollutants, in air, soil, water, or plants.
Amphibolite schist bedrock	Strongly foliated crystalline metamorphic bedrock containing amphibolite minerals that may include magnesium, iron, calcium, sodium, aluminum, and iron.
annual grassland	A heterogeneous mix of non-native grasses, annual forbs and wildflowers.
appurtenant structures	Refers to ancillary features of a dam, such as outlets, spillways, bridges, drain systems, tunnels, towers, etc.
aquifer	Underground layer of porous rock, sand, etc. that contains water.

Term	Definition
archaeology	The study of human cultures through the recovery, documentation and analysis of material remains and environmental data, including architecture, artifacts, human remains, and landscapes.
arterial	A signalized street that primarily serves through-traffic and that secondarily provides access to abutting properties, with signal spacings of 2.0 miles or less.
artifact	Any object manufactured, used or modified by humans. Common examples include tools, utensils, art, food remains, and other products of human activity.
asbestos	A naturally occurring fibrous silicate mineral popular in manufacturing and industry due to its strength, chemical and thermal stability. USEPA has banned or severely restricted its use in manufacturing and construction because it has been found to be a health hazard.
attainment area	Areas that do meet the ambient air quality standards.
auxiliary spillway	A spillway, usually located in a saddle or depression in the reservoir rim which leads to a natural or excavated waterway, located away from the dam which permits the planned release of excess flood flow beyond the capacity of the service spillway. A control structure is seldom furnished. The crest is set at the maximum water surface elevation for a 100-year flood or some other specific frequency flood. The auxiliary spillway thus has only infrequent use. Any secondary spillway that is designed to be operated very infrequently and possibly in anticipation of some degree of structural damage or erosion to the spillway during operation.
background view	The part of a scene or view that lies behind objects in the foreground.
bathymetry	The measurement of the depth of the waterbody floor from the water surface; the equivalent of topography, or an underwater elevation model.
bedrock	The solid rock that underlies all soil, sand, clay, gravel, and other loose materials on the earth's surface.

Term	Definition
beneficial use	Uses of the waters of the State that may be protected against quality degradation. Examples of beneficial use designations include; domestic, municipal, agricultural and industrial supply; recreation and navigation; and the preservation of fish and wildlife.
benthic	Pertaining to the bottom of a body of water.
berm	A horizontal step or bench in the upstream or downstream face of an embankment dam.
best management practices	Best Management Practices (BMPs) are effective, practical, structural or nonstructural methods which prevent or reduce the movement of sediment, nutrients, pesticides and other pollutants from the land to surface or ground water, or which otherwise protect water quality from potential adverse effects of activities.
biological assessment	Information prepared by, or under the direction of, a Federal agency to determine whether a proposed action is likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify proposed critical habitat. Biological assessments must be prepared for "major construction activities." See 50 CFR §402.02. The outcome of this biological assessment determines whether formal consultation or a conference is necessary. [50 CFR §402.02, 50 CFR §402.12]
biological opinion	A written statement setting forth the opinion of the USFWS or the NMFS as to whether or not a Federal action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat.
borrow	Material excavated from one area to be used as fill material in another area.
brome	An opportunistic and imported annual grass, usually considered inferior forage, which has replaced native grasses throughout the West.

Term	Definition
California Endangered Species Act (CESA)	California legislation that prohibits the "take" of plant and animal species designated by the CDFG as either endangered or threatened. Take includes hunting, pursuing, catching, capturing, killing, or attempting such activity. CESA provides the CDFG with administrative responsibilities over the plant and wildlife species listed under the State act as threatened or endangered. CESA also provides CDFG with the authority to permit the take of State-listed species under certain circumstances.
California Environmental Quality Act (CEQA)	California legislation that requires State, regional, and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. Public agencies must comply with CEQA when they undertake activities that 1) are subject to some discretionary approval from a government agency and 2) that may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment. Depending on the potential effects of the project, different levels of environmental review are required under the law. The most substantial form of review is an environmental impact statement (EIR). A project may not be approved if feasible alternatives or mitigation measures are able to substantially lessen the significant environmental effects of the project. See Public Res. Code Sections 21001.1, 21002, 21080; Guidelines 15002(c).
candidate species	Plant and animal taxa considered for possible addition to the List of Endangered and Threatened Species. These are taxa for which the Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions. [61 FR 7596-7613 (February 28, 1996)]

Term	Definition
carbon monoxide (CO)	A colorless, odorless, poisonous gas, produced by incomplete burning of carbon-based fuels, including gasoline, oil, and wood. Carbon monoxide is also produced from incomplete combustion of many natural and synthetic products.
census tract	A small, relatively permanent statistical subdivision of a county established by the US Census and designed to be homogenous with respect to population characteristics, economic status, and living conditions. Tracts usually have between 2,500 and 8,000 residents.
chaparral	Habitat that consists of a dense cover of perennial, mostly evergreen shrubs, generally 1 to 3 meters in height.
coliform bacteria	Organisms common to the intestinal tract of humans and animals; the organisms' presence in waste water is an indicator of pollution. Generally reported as colonies per 100 milliliters of sample.
conservation measures	Actions to benefit or promote the recovery of listed species that are included by the Federal agency as an integral part of the proposed action. These actions will be taken by the Federal agency or applicant, and serve to minimize or compensate for, project effects on the species under review. These may include actions taken prior to the initiation of consultation, or actions which the Federal agency or applicant have committed to complete in a biological assessment or similar document.
contractor use area	Designated area to be used by construction contractor(s) for materials stockpiling, staging, parking, portable toilets, etc.
control delay	The component of delay that results when a control signal causes a lane group to reduce speed or to stop; it is measured by comparison with the uncontrolled condition.
conveyance	A pipeline, canal, natural channel, or other similar facility that transports water from one location to another.
crest	The top surface of the dam. A roadway may be constructed across the crest to permit vehicular traffic or facilitate operation, maintenance, and examination of the dam. Also, the high point of the spillway control section.

Term	Definition
criteria pollutant	Any pollutant for which USEPA has established a National Ambient Air Quality Standard (NAAQS), specifically carbon monoxide, lead, nitrogen oxides, ozone, particulate matter, and sulfur oxides.
critical habitat	Designation for Federally listed species. Consists of: (1) the specific areas within the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of the Federal ESA (16 USCA 1533), on which are found those physical or biological features (constituent elements) that are: (a) essential to the conservation of the species and (b) may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of ESA (16 USCA 1533), upon a determination by the Secretary that such areas are essential for the conservation of the species. (16 USCA 1532(5)(A).) Designated critical habitats are described in 50 CFR 17 and 50 CFR 226.
cubic feet per second (cfs)	Rate of water release representing a volume of 1 cubic foot passing a given point during 1 second, equivalent to approximately 7.48 gallons per second or 448.8 gallons per minute. In a stream channel, a release of 1 cubic foot per second is equal to the release at a rectangular cross section, 1 foot wide and 1 foot deep, flowing at an average velocity of 1 foot per second.
cultural resource	A wide-ranging category that describes an extensive variety of resources, regardless of significance. These resources may include archaeological sites, isolated artifacts, features, records, manuscripts, historical sites, traditional cultural properties, historical resources, and historic properties.
cumulative impact	The incremental impact or effect of the action together with impacts of past, present, and reasonable foreseeable future actions (regardless of the source of these other actions).

Term	Definition
dam	Dams are usually constructed by making a large embankment that blocks an existing watercourse. This embankment is used to control the release of flood waters downstream of the Dam. Dams usually contain a small outlet pipe that limits the amount of water that can exit the dam. Any flows in excess of the capacity of the dam outlet are stored behind the dam. The Folsom Facility is operated and maintained by Reclamation as part of the CVP.
day-night noise level	The day-night noise level (L_{dn}) is the energy average sound level for a 24-hour day determined after the addition of a 10-dBA penalty to all noise events occurring at night between 10:00 p.m. and 7:00 a.m. The L_{dn} is used by local jurisdictions to rate community noise impacts from transportation noise sources.
dBA	A unit of measurement/sound level for A-weighted sounds. Environmental sounds are measured with the A-weighted scale of the sound level meter. The A scale simulates the frequency response of the human ear, by giving more weight to the middle frequency sounds, and less to the low and high frequency sounds.
decibel (dB)	A unit used to express the intensity of a sound wave. In sound, decibels generally measure a scale from 0 (the threshold of hearing) to 120-140 dB (the threshold of pain).
de mimimis amount	A legal term for an amount that is small enough to be ignored, too small to be taken seriously.
detritus	Dead or decaying organic matter.
dewatering	Removing water by pumping, drainage, or evaporation.
dike	An embankment that blocks an area on a reservoir or lake rim that is lower than the top of the dam.
direct (economic) effect	Change in final demand in an industry.

Term	Definition
dissolved oxygen	Amount of free oxygen found in water; perhaps the most commonly employed measurement of water quality. Low dissolved oxygen (DO) levels adversely affect fish and other aquatic life. The ideal dissolved oxygen for fish life is between 7 and 9 mg/L; most fish cannot survive when the DO level falls below 3 mg/L.
drainage area	An area that drains naturally to a particular point on a stream.
diversion	The action of taking water out of a river system or changing the flow of water in a system for use in another location.
dredge	To dig under water. A machine that digs under water.
dredge tailings	The gravel remaining after the removal of its gold content during gold mining operations in the early 1900's. The tailings (remains) were placed back in the river channel.
downstream	Away from the source of water. The dry side of a dam.
drainage blanket	A drainage layer placed directly over the foundation material.
earthfill dam	An embankment dam in which more than 50 percent of the total volume is formed of compacted earth material generally smaller than 3-inch size. Seepage through the dam is controlled by the designed use of upstream blankets and/or internal cores constructed using compacted soil of very low permeability.
easement	The right to use land owned by another for some specific purpose.
ecosystem	A recognizable, relatively homogeneous unit that includes organisms, their environment, and all the interactions among them.
electric conductivity	The measure of a solution's ability to conduct electricity. Electric conductivity units are used to express salinity levels in soil and water. When salt is dissolved in water the conductivity increases, so the more salt, the higher the value.
embankment	An earth structure the top of which is higher than the adjoining surface. A shaped earth or rockfill dam. Fill material, usually earth or rock, placed with sloping sides and with a length greater than its height. An embankment is generally higher than a dike.

Term	Definition
emergent	A plant rooted in shallow water that has most of its vegetative growth above water.
endangered species (CESA)	Any species listed as endangered under the California Endangered Species Act. Endangered species are native California species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that has been determined by the CDFG to be in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, exploitation, predation, competition, or disease. See California Fish and Game Code Section 2062.
endangered species (ESA)	Any species listed as endangered under the Federal ESA. Endangered species are any species (including subspecies or a qualifying distinct population segment) that is in danger of extinction throughout all or a significant portion of its range. See 16 USCA 1532(6).
environmental impact report (EIR)	A detailed written report, required by the CEQA, analyzing the environmental impacts of a proposed action, adverse effects that cannot be avoided, alternative courses of action, and cumulative impacts.
environmental impact statement (EIS)	A detailed written statement, required by Section 102(2)(c) of the National Environmental Policy Act (NEPA), analyzing the environmental impacts of a proposed action, adverse effects that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance of long-term productivity, and any irreversible and irretrievable commitment of resources.

Term	Definition
environmental justice	Refers to the concept that people of all races, cultures, and incomes deserve fair treatment with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies. Executive Order 12898 mandates that Federal agencies identify and address, as appropriate, disproportionately high adverse environmental effects of its activities on minority populations and low income populations in the United States and its territories.
equivalent noise level	The equivalent noise level (L_{eq}) is the constant sound level that in a given period has the same sound energy level as the actual time-varying sound pressure level. L_{eq} provides a methodology for combining noise from individual events and steady state sources into a measure of cumulative noise exposure. It is used by local jurisdictions and the Federal Highway Administration (FHWA) to evaluate noise impacts.
erosion	A gradual wearing away of soil or rock by running water, waves, or wind. Surface displacement of soil caused by weathering, dissolution, abrasion, or other transporting.
exhaust gas recirculation (EGR)	An emission control method that involves recirculating exhaust gases from an engine back into the intake and combustion chambers. This lowers combustion temperatures and reduces NO_x.
fault creep	Gradual movement along a fault that occurs in the absence of an earthquake.
fault zone	In geology, faults are discontinuities (cracks) in the Earth's crust that are the result of differential motion within the crust. Faults are the source of many earthquakes that are caused by slippage vertically or laterally along the fault.

Term	Definition
Federal Endangered Species Act (ESA)	Federal legislation that requires Federal agencies, in consultation with the USFWS and NOAA Fisheries, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of these species. The ESA recognizes the value to the nation of species in danger of, or threatened with, extinction. The act requires Federal agencies to conserve these species and their habitats and ranges to the extent practicable. Section 4 of the ESA (16 USCA 1533) provides a listing process for species considered "endangered" (in danger of becoming extinct) or "threatened" (threatened to become endangered). The Secretary of Commerce, acting through NOAA Fisheries, is involved for projects that may affect marine or anadromous fish species listed under the ESA. All other species listed in the ESA are under USFWS jurisdiction. Section 7 of the ESA (16 USCA 1536(a)(2)) requires that all Federal agencies, in consultation with the Secretaries of the Interior and Commerce (acting through USFWS and NOAA Fisheries, respectively), ensure that their actions do not jeopardize the continued existence of species listed as endangered or threatened and protected or result in the destruction or adverse modification of the critical habitat of these species. Section 9 of the ESA (16 USCA 1538) prohibits take of a listed species. Section 9 (16 USCA 1538) compliance is applicable if the proposed action would result in the take of any listed threatened (if not subject to special rule) or endangered fish or wildlife species and such take is not authorized in a biological opinion issued by USFWS or NOAA Fisheries. Section 10 of the ESA (16 USCA 1539) authorizes the conditions for the USFWS or NOAA Fisheries to issue a permit for incidental take of a listed species when there is no other Federal agency involved. See 16 USC 153 1 et seq. Federally covered species.

Term	Definition
fill	Manmade deposits of natural soils or rock products and waste materials designed and installed in such a manner as to provide drainage, yet prevent the movement of soil particles due to flowing water.
filter	A band or zone of granular material that is incorporated into a dam and is graded (either naturally or by selection) to allow seepage through or within the layers to a drain layer while preventing the migration of material from adjacent zones to the drain layer.
fine particulate matter	Particulate matter less than 2.5 microns in diameter (PM2.5).
Folsom Dam Safety and Flood Damage Reduction Project (Folsom DS/FDR Project)	A cooperative effort by Reclamation and the Corps, along with SAFCA, and the Central Valley Flood Protection Board, to address hydrologic, static, and seismic issues with Folsom Dam and Appurtenant Structures. The JFP and MIAD Modification Project are both elements of this larger project.
Folsom Facility	The physical features that surround Folsom Reservoir, including LWD, RWD, Main Concrete Dam, Dikes 1 through 8, and MIAD.
Joint Federal Project (JFP)	The JFP refers to construction of a new auxiliary spillway at Folsom Reservoir to address both dam safety and flood damage reduction. It is part of the cooperative effort by Reclamation and the Corps, along with SAFCA, and the Central Valley Flood Protection Board, to address hydrologic, static, and seismic issues with Folsom Dam and Appurtenant Structures.
foreground view	The part of an image or view that appears to be closest to the viewer.
foundation (of dam)	The material on which the dam structure is placed. Often modified to provide more favorable hydraulic characteristics.
freeboard	Generally defined as the difference in elevation from the top edge of a flood control facility (channel, dam, basin) to the design water surface elevation. Freeboard provides a factor of safety and protects against unknown factors such as wave action. Freeboard varies based on the type of project and velocities of flows, but is generally between 1-3 feet.

Term	Definition
freshwater marsh	Freshwater marsh communities within the Project area are wetland communities fed by seeps or springs and are permanently to semi-permanently flooded.
friable asbestos	A form of asbestos found to be the most dangerous because of its ability to become airborne. Friable asbestos can be crushed or reduced to powder form with hand pressure.
fugitive dust	Particles lifted into the ambient air caused by man-made and natural activities such as the movement of soil, vehicles, equipment, blasting, and wind. This excludes particulate matter emitted directly from the exhaust of motor vehicles and other internal combustion engines, from portable brazing, soldering, or welding equipment, and from piledrivers.
habitat enhancement	To improve degraded habitat. Management actions that enhance habitat do not result in increasing the extent of habitat area.
habitat protection, protect habitat	To maintain the existing extent and quality of habitat.
habitat restoration, restore habitat	To create habitat. Management actions that restore habitat.
hazardous waste	Any solid, liquid, or gaseous substance which, because of its source or measurable characteristics, is classified under State or Federal law as hazardous and is subject to special handling, shipping, storage, and disposal requirements.
historic property	Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. This includes artifacts, records, and remains that are related to and located within such properties. As a general guideline, a cultural resource should be at least 50 years old to be considered as a historic property.
historical resource	Per CEQA guidelines, a resource listed or eligible for listing on the California Register of Historical Resources. It must be significant based on one or more of four criteria to be considered a historical resource on a local, state, or national level.

Term	Definition
igneous rock	Igneous rocks are formed from magma (melted rock) that has cooled and solidified, either within the Earth's crust or on the Earth's surface.
impervious	Surface that prevents or significantly reduces the entry of water into the underlying soil, resulting in runoff from the surface in greater quantities and/or at an increased rate when compared to natural conditions prior to development.
impoundment	Body of water created by a dam.
Indian trust assets (ITAs)	Legal interests in property held in trust by the United States government for Indian tribes or individuals, or property protected under United States law for Indian tribes and individuals. Federal agencies are required to take responsibility for protection and maintenance of ITAs. There are no ITAs present in the project area; therefore, they were not evaluated.
indirect (economic) effect	Changes in industry sectors within the region that supply goods and services to industries directly affected by the changes in final demand.
induced (economic) effect	Changes in economic activity resulting from household spending of the income earned from changes in final demand.
inhalable particulate matter	Particulate matter less than 10 microns in diameter (PM_{10}).
input-output (I-O) analysis	Describes commodity flow from producers to intermediate and final consumers.
inundation area	Area downstream from a dam that would be subject to flooding in the event of a dam failure or large spillway release.
invasive species	Non-native species of plants or animals that out-compete native species in a specific habitat.
invertebrate	An animal that lacks a backbone or spinal column.
jet grouting	A method of compacting soil using a hose or other device by injecting a grout slurry at high pressures into the liquefiable soils.
jurisdiction	The territory or geographic area within which power can be exercised, or the power or authority of a court to hear and try a case.
landslide	An abrupt movement of soil and bedrock downhill in response to gravity. Landslides can be triggered by an earthquake or other natural causes.

Term	Definition
levee	An elevated berm that is used to protect adjacent low lying ground from floodwaters. The levee is usually lined with a structural material such as concrete or rip-rap to ensure that it does not fail from erosion. This lining usually extends many feet below ground to ensure that scour caused by high water velocities cannot undermine the levee.
level of service (LOS)	A qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience.
liquefaction	Process where water-saturated sediment (sandy material) temporarily looses strength, usually because of an earthquake, and behaves like a fluid. Soil or sand changes from solid ground and behaves like a liquid, which can cause the ground above the liquefied sediment to break into small blocks.
listed species (CESA)	Species or subspecies declared as threatened or endangered by the CDFG in 14 CCR Section 670.5.
listed species (ESA)	Species, including subspecies, of fish, wildlife, or plants Federally listed at 50 CFR 17.11 and 50 CFR 17.12 as either endangered or threatened, or listed at 14 CCR Section 670.2 and 14 CCR Section 670.5 as threatened or endangered.
low-income population	That portion of the population that falls within the low-income bracket as defined based on Federal poverty thresholds. The low-income index is determined annually by the U.S. Department of Health and Human Services.
maximum credible earthquake (MCE)	The largest hypothetical earthquake that may be reasonably expected to occur.
maximum contaminant level (MCL)	The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the Maximum Contaminant Level Goal as feasible using the best available treatment technology.
mesic site	Characterized by having a medium moisture supply e.g., a type of habitat or soil.

Term	Definition
metamorphic rock	A rock changed from its original form and/or composition by heat, pressure, or chemically active fluids, or some combination of them.
middleground view	The part of an image or view that lies between the foreground and background.
minority population	Any individual or racial/ethnic group that is not categorized as Non-Hispanic White. Major racial groups include; Hispanic, Black, Asian, American Indian and Alaska Native, and Native Hawaiian and other Pacific Islander.
mitigation	To moderate, reduce, or alleviate the impacts of a proposed activity; including: (a) avoiding the impact by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments.
most probable number (MPN)	Most Probable Number of coliform-group organisms per unit volume of sample water. Expressed as the number of organisms per 100 mL of sample water.
multiplier	A ratio of total economic effects to direct economic effects that captures the size of indirect and induced effects to the region's economy.
National Environmental Policy Act (NEPA)	Federal legislation establishing the national policy that environmental impacts will be evaluated as an integral part of any major Federal action. Requires the preparation of an environmental impact statement (EIS) for all major Federal actions significantly affecting the quality of the human environment.
National Pollutant Discharge Elimination System (NPDES)	A permitting program under section 402 of the Clean Water Act required for all point sources discharging pollutants into waters of the United States. The purpose of the NPDES program is to protect human health and the environment.

Term	Definition
native vegetation	Stands of blocks of naturally occurring plant communities. These include a range of vegetation associations such as woodlands, grasslands, forests, wetlands, mangroves etc. Scattered native trees and shrubs in cleared paddocks or urban areas are more usually considered separately as scattered or isolated plants.
navigable waters	Waters of the United States including: (a) All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide. (b) Interstate waters, including interstate wetlands. (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats and wetlands, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce, including waters used or which could be used for industries in interstate commerce. (d) All impoundments of waters otherwise defined as navigable waters. (e) Tributaries of waters identified in (a) through (d). (f) Wetlands adjacent to waters identified in (a) through (d).
nephelometric turbidity unit (NTU)	NTU is an indication of the clarity of water, or the amount of suspended particles in water. Low NTU values indicate high quality water. NTU is obtained by measuring the amount of scattering of light in water.
nitrogen dioxide	A pollutant that causes smog and acid rain, as well as eye, throat, and lung irritation. Nitrogen dioxide is mainly produced by burning fossil fuels (e.g., emissions from burning gasoline in a car).
nitrogen oxide (NO_x)	A mixture of gases composed of oxygen and nitrogen. Two of the most harmful are nitric oxide (NO) and nitrogen dioxide. Nitrogen oxides are released to the air from the exhaust of motor vehicles, and the burning of coal, oil, or natural gas. These pollutants cause smog and acid rain, as well as eye, throat, and lung irritation.

Term	Definition
non-attainment area	Areas that do not meet the ambient air quality standards.
non-criteria pollutant	Any recognized and otherwise regulated air pollutants that are not listed as criteria pollutants.
non-native species	Also called introduced species or exotic species; refers to plants and animals that originate elsewhere and are brought into a new area, where they may dominate the local species or in some way negatively impact the native species environment.
nonpoint source	A contributing factor to water pollution that cannot be traced to a specific spot. Man-made or man-induced alteration of the chemical, physical, biological, or radiological integrity of water, originating from any source other than a point source.
North American Vertical Datum (NAVD)	The vertical control datum established in 1991 by the minimum-constraint adjustment of the Canadian-Mexican-U.S. leveling observations. It held fixed the height of the primary tidal bench mark, referenced to the new International Great Lakes Datum of 1985 local mean sea level height value, at Father Point/Rimouski, Quebec, Canada.
obligate species	A species limited to a restricted environment, such as a wetland.
OHWM	Ordinary high water mark of Folsom Reservoir, which is elevation 466 feet.
one-hundred year (100-year) flood	A flooding event that has a one percent chance of occurring in any given year. The term "100-year" is a measure of the size of the flood, not how often it occurs. Several 100-year floods can occur within the same year or within a few short years. The 100-year event for any given area is based on a statistical frequency analysis of local rainfall data. The analysis determines the amount of rainfall that would only have a one percent chance of occurring in a given year. Hydrologic analysis is then applied to the watershed, based on the 100-year rainfall magnitude. The result provides the expected release of the watershed during a 100-year event.
overtop	Flow of water over the top of a dam or embankment.

Term	Definition
ozone	Ozone gas is a molecule that consists of three oxygen molecules. It is naturally occurring in the earth's atmosphere at all levels and is responsible for filtering out much of the sun's ultraviolet radiation.
palliative	Describes a material that may be used to reduce or mitigate adverse effects. For instance, a binding palliative material may be applied to an exposed surface for dust and erosion control.
panorama	A panorama is a wide, all-encompassing view; hence also a panoramic format.
peak particle velocity (PPV)	Pertaining to vibration measurements, peak particle velocity is the maximum rate of ground movement measured by any of the 3 mutually perpendicular components of ground motion. Units are expressed in inches per second. PPV is often used in determining potential damage to buildings from stress associated with blasting and other construction activities.
perennial plant	A plant that grows for more than one season; it over-winters in a dormant condition and resumes growth the following season.
petrographic	The description and classification of rocks
pH	A relative scale, from 0 to 14, of how acidic or basic (alkaline) a material is, where a pH of 7 is neutral, smaller readings are increasingly acid.
photochemical reaction	The chemical transformation caused by sunlight. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.
piezometer	An instrument which measures pressure head or hydraulic pressures in a conduit or hydraulic pressures within the fill of an earth dam or the abutment; at the foundation because of seepage or soil compression; or on a flow surface of a spillway, gate, or valve.
piping	Erosion of embankment or foundation material (soil) due to leakage.

Term	Definition
point source	Any discernible, confined, or discrete conveyance from which pollutants are or may be discharged, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft.
probable maximum flood (PMF)	The largest flood that may reasonably be expected to occur at a given point on a stream from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible on a particular watershed.
promulgated	Documents that are formally made public.
radiological waste	Radioactive waste is produced from activities that use radioactive materials such as mining, nuclear power generation, and various processes in industry, defense, medicine, and scientific research. Radioactive waste can be in gas, liquid or solid form, and the waste can remain radioactive for a few hours or several months or even hundreds of thousands of years. There are varying degrees of radioactivity.
re-entrained road dust	Particulate emissions that are kicked-up from movement of vehicles on paved roadway surfaces.
regional capture rate	Percentage of spending that accrues to the region's economy as direct sales or final demand.
re-entrained road dust	Particulate emissions that are kicked-up from movement of vehicles on paved roadway surfaces.
regional capture rate	Percentage of spending that accrues to the region's economy as direct sales or final demand.
riparian	The strip of land adjacent to a natural watercourse such as a river or stream. Often supports vegetation that provides important wildlife habitat values when a complex forest structure is present and important fish habitat values when vegetation grows large enough to overhang the bank.
riprap	A layer of large uncoursed stones, broken rock, or precast blocks placed in random fashion on the upstream slope of an embankment dam, on a reservoir shore, or on the sides of a channel as protection against wave and ice action.

Term	Definition
ruderal fields	Growing along roadsides or in disturbed or abandoned farmland.
Safety of Dams Program	Reclamation's program to identify potential issues with existing dams and develop corrective actions to protect public safety, property, and the environment. Reclamation's main objective under the Dam Safety Program is to ensure the Folsom Facility can safely pass the Probable Maximum Flood (PMF).
sedimentary rock	Rocks formed from material, including debris of organic origin, deposited as sediment by water, wind, or ice and then compressed and cemented together by pressure.
seepage	Percolation of water through the soil from unlined canals, ditches, laterals, watercourses, or water storage facilities.
seismic	Of or related to movement in the earth's crust caused by natural relief of rock stresses.
sensitive species	Listed species, species that are candidates for listing, and other species that have been designated as species of special concern by Federal or State agencies or scientific organizations (see "special-status species").
shell	Shell material includes impervious soil and miscellaneous shell soil placed on the outside of a dam or dike to create a shell.
siltation/sedimentation	Deposition of waterborne sediments due to a decrease in velocity and corresponding reduction in the size and amount of sediment which can be carried.
slope	The inclined face of an embankment or other inclination from the horizontal. It is measured as the ratio of the number of units of horizontal distance to the number of corresponding units of vertical distance. The term is expressed as a percent when the slope slope is gentle, in which case the term "gradient" is also used.

Term	Definition
special status species	Species in any of the following categories: plants listed, proposed for listing, or candidates for possible future for listing under the Federal Endangered Species Act, plants listed or proposed for listing under the California Endangered Species Act, plants listed as rare or endangered under the California Native Plant Protection Act, plants that meet the definitions of rare or endangered under the State CEQA Guidelines, plants considered by the CNPS to be “rare, threatened, or endangered in California” (Lists 1B and 2), plants considered by CNPS as plants about which more information is needed to determine their status, and plants of limited distribution (Lists 3 and 4), which may be included as special-status species on the basis of local significance.
species	Species of fish, wildlife, or plants, any subspecies of fish, wildlife, or plants, and any distinct population segment of vertebrate fish or wildlife that interbreeds when mature.
species of concern	Species that could be affected by actions and are not listed as threatened or endangered under the Federal ESA; proposed for listing under ESA; candidates under ESA; listed as threatened or endangered under the CESA; candidates under CESA; plants listed as rare under the California Native Plant Protection Act; California fully protected species or specified birds under various sections of the California Fish and Game Codes; California species of special concern; or California Native Plant Society List lA, lB, 2, or 3 species.
spillway	The channel or passageway around or over a dam through which excess water is released or "spilled" past the dam without going through the turbines. A spillway is a safety valve for a dam and, as such, must be capable of discharging major floods without damaging the dam, while maintaining the reservoir level below some predetermined maximum level.
staging area	See contractor use area.

Term	Definition
static	A fixed or stationary condition. In dam operations it refers to issues that occur during normal daily operations, including potential seepage and piping of the wing dams and dikes.
storage capacity	The total amount of reservoir capacity normally available for release from a reservoir below the maximum storage level. It is total or reservoir capacity minus inactive storage capacity. More specifically, it is the volume of water between the outlet works and the spillway crest.
subsidence	Sinking of the land surface due to compaction of soil caused by loading, removal of underground fluids, or other mechanisms.
subsidence inversion	An inversion at elevations of 1,000 to 2,000 feet enhanced by vertical mixing in the air layer below the inversion. A condition that produces an increase in temperature with height.
sulfur dioxide (SO_2)	Sulfur dioxide is a gas produced by burning coal, most notably in power plants. Some industrial processes, such as production of paper and smelting of metals, produce sulfur dioxide. Sulfur dioxide is closely related to sulfuric acid, a strong acid. Sulfur dioxide plays an important role in the production of acid rain.
surface inversion	A temperature inversion based at the earth's surface (from 1 to 500 feet); that is, an increase of temperature with height beginning at the ground level. This condition is due primarily to greater radiative loss of heat at and near the surface than at levels above.
suspended particulate matter (SPM)	Particles suspended in the air of less than 10 micrometer in size which can accumulate in the lungs and bronchi bringing about breathing problems for those affected. SPM is caused by human activities (cars and industry) but also by natural phenomena.
swale	A low place in a tract of land. A wide, shallow ditch, usually grassed or paved. A wide open drain with a low center line.

Term	Definition
take	Under the ESA, "To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" in regard to Federally listed, endangered species of wildlife (16 USCA 1532[19]). "Harm" is further defined as an act "which actually kills or take threatened species injures". Harm may include "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter" (50 CFR 17.3). Under the California Fish and Game Code, take is defined as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (California Fish and Game Code Section 86).
terrestrial species	Types of species of animals and plants that live on or grow from the land.
threatened species (ESA)	Any species listed as threatened under the CESA. Threatened species are native California species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that have been determined by the CDFG, although not presently threatened with extinction, to be likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts. See California Fish and Game Code Section 2067.
toe	The junction of the face of a dam with the ground surface.
toe drain	Open-jointed tile or perforated pipe located at the toe of the dam used in conjunction with horizontal drainage blankets to collect seepage from the embankment and foundation and conveys the seepage to a location downstream from the dam.
total dissolved solids (TDS)	A water quality parameter defining the concentration of dissolved organic and inorganic chemicals in water, usually expressed in milligrams per liter (mg/L).

Term	Definition
total maximum daily load (TMDL)	The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under Clean Water Act Section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.
total organic carbon (TOC)	A measure of the concentration of organic carbon in water, determined by oxidation of the organic matter into carbon dioxide.
toxic air contaminant (TAC)	As defined by California Health and Safety Code, Section 39655 (a): an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. Substances which have been identified by the USEPA as hazardous air pollutants (e.g. benzene, asbestos) shall be identified by the Board as toxic air contaminants.
toxic waste	A waste that can produce injury if inhaled, swallowed, or absorbed through the skin.
tributary	River or stream flowing into a larger river or stream.
turbidity	A cloudy appearance that results when excessive silt or other substances are in the water.
unincorporated land	A region of land is unincorporated if it is not a part of any municipality. To "incorporate" in this context means to form a municipal corporation, i.e., a city or similar. Unincorporated, in turn, implies no city and hence no city, town, village, or other municipal government.
upstream	Towards the source of water. The water side of a dam.
value added	Economic measurement of wages and salaries, proprietor's income, dividends and interest, and indirect business taxes.
value of output	Total value of an industry's production.
vernal pool	Seasonally ponded landscape depressions in which water accumulates because of limitations to subsurface drainage and that support a distinct association of plants and animals.
vista	A view or the visual percept of a region.

Term	Definition
volatile organic compound (VOC)	Reactive gases released during combustion or evaporation of fuel and regulated by USEPA. VOCs react with NO_x in the presence of sunlight and form ozone.
watershed	An area that drains to a particular channel or river, usually bounded peripherally by a natural divide of some kind such as a hill, ridge, or mountain.
water table	The surface of underground, gravity-controlled water, or the level of ground water.
wetlands	Lands including swamps, marshes, bogs, and similar areas such as wet meadows, river overflows, mudflats, and natural ponds. An area characterized by periodic inundation or saturation, hydric soils, and vegetation adapted for life in saturated soil conditions. Any number of tidal and nontidal areas characterized by saturated or nearly saturated soils most of the year that form an interface between terrestrial and aquatic environments; including freshwater marshes around ponds and channels, and brackish and salt marshes. A jurisdictional wetland is subject to regulation under the Clean Water Act. A nonjurisdictional is subject to consideration under the Fish and Wildlife Coordination Act.
wing dam	A dam that only partially blocks a river and extends from only one riverbank.
zoning	Land use regulations are enacted to manage use of land and are used to control the character of an area.