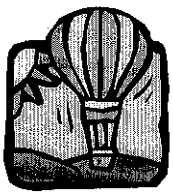
5.8 Air Quality

Most impacts on air quality are associated with construction activities, would last only for the duration of construction, and are considered less than significant. The CALFED Bay-Delta Program could improve air quality by decreasing agricultural operations-related emissions.



5.8 Air Quality

5.8.1 SUMMARY

The quality of the air we breathe plays an important role in the quality of life. Airsheds can be defined on local, regional, and global scales. Some impacts on local airsheds affect the global community. Some CALFED Bay-Delta Program (Program) elements could result in noticeable but minor long-term beneficial impacts on air quality. Short-term adverse air quality impacts associated with the Program primarily are related to construction activities and can be mitigated to a less-than-significant level.

Preferred Program Alternative. A temporary reduction in air quality could result from any Program action that involves construction activities.

Retirement of existing agricultural lands could result in long-term beneficial air quality impacts associated with decreases in emissions from preparing agricultural land, burning fossil fuels, and applying herbicides and pesticides. Potentially significant adverse impacts that could result from land conversion include increased fugitive emissions of wind-blown dust (if land was left as unvegetated, fallowed land) and increased emissions (if land was developed for residential, commercial, or recreational uses). These impacts can be mitigated to less-than-significant levels.

Retirement of existing agricultural lands could decrease emissions from preparing agricultural land, burning fossil fuels, and applying herbicides and pesticides.

Increasing wetland vegetation could result in a continuous increase in methane gas emissions due to the natural anaerobic decay of the associated vegetation. This increase is considered less than significant.

Modification of existing filtration plants; development of new pipelines, well fields, and pump stations; and increased or decreased pumping activities could result in operations-related air quality impacts (both adverse and beneficial) in agricultural and urban environments.

Increased use in the agricultural sector of pressurized irrigation systems could create a greater reliance on fossil fuels or other energy sources. This increase could adversely affect air quality either locally (with fossil fuels) or regionally if energy is provided from out-of-region facilities. Changes in cultivation practices to accompany increased water use efficiency could result in adverse or beneficial impacts.

Changes in crop type or agricultural acreage could positively or negatively affect air quality. Crop fallowing could result in reduced fugitive dust production and reduced air emissions from declining use of equipment and agricultural chemicals. Crop shifting could result in reduced crop burning. Increased cultivation may increase fugitive dust. Increases in equipment use and cultivation, agricultural chemical use, and crop shifting and burning may increase emissions. Shifts to crops associated with drier topsoil may increase fugitive dust production. Increased crop shifting may increase emissions.

Alternatives 1, 2, and 3. Potentially significant, short-term, construction-related impacts are associated with all Program alternatives. Long-term impacts on air quality are considered less than significant.

The following table presents the potentially significant adverse impacts and mitigation strategies associated with the Preferred Program Alternative. Mitigation strategies that correlate to each listed impact are noted in parentheses after the impact.

Potentially Significant Adverse Impacts and Mitigation Strategies
Associated with the Preferred Program Alternative

Potentially Significant Adverse Impacts	Mitigation Strategies
Direct, short-term air pollutant emissions during construction activities (1,2,3,6,7,8,9,10,11,12,13).	1. Setting traffic limits on construction vehicles.
Increased fugitive emissions of wind-blown dust (13).	2. Maintaining properly tuned equipment.
Increased fugitive emissions of wind-blown dust from unvegetated, fallowed land; shifts to crops associated with drier topsoil; or changes in cultivation practices (13,14).	3. Limiting the hours of operation or amount of equipment.
Increased emissions associated with prescribed burning programs (5).	4. Limiting the use of agricultural chemicals.
Increased emissions from increases in equipment use and cultivation, agricultural chemical use, and crop shifting and burning (2,4).	5. Coordinating prescribed burning programs with relevant air quality management agencies to ensure that the programs are accounted for in state and federal air quality management plans.
Increased emissions if land use changes lead to higher residential, commercial, or recreational uses (3,15,16).	6. Regular, periodic watering of construction sites to control levels of dust in the air.
Increased use of fossil fuels or other energy resources associated with pressurized irrigation systems (2,3,10).	7. Using soil stabilizers and dust suppressants on unpaved service roadways.
	8. Daily contained sweeping of paved surfaces.
	9. Limiting vehicle idling time.

Potentially Significant Adverse Impacts and Mitigation Strategies
Associated with the Preferred Program Alternative
(continued)

10. Using alternatively fueled equipment.

11. Requiring selection of borrow sites that are closest to fill locations.

11. Implementing construction practices that reduce generation of particulate matter.

13. Hydroseeding and mulching exposed areas.

14. Using cultivating practices that minimize soil disturbance.

15. Following air basin management plans to avoid or minimize vehicle-related emissions.

16. Restricting the kinds of recreational vehicles or the times of operation for certain off-road vehicles on fallowed agricultural land to limit the amount of fugitive dust.

No potentially significant unavoidable impacts on air quality are associated with the Preferred Program Alternative.

5.8.2 AREAS OF CONTROVERSY

Under CEQA, areas of controversy involve factors that are currently unknown or reflect differing opinions among technical experts. Unknown information includes data that are not available and cannot readily be obtained. The opinions of technical experts can differ, depending on which assumptions or methodology they use. There are no areas of controversy for this resource category.

5.8.3 AFFECTED ENVIRONMENT/ EXISTING CONDITIONS

This section characterizes the existing air quality environment in the study area, including the regulatory setting.

The federal Clean Air Act (CAA) requires the EPA to establish and maintain standards for common air pollutants (Table 5.8-1). To establish standards, the EPA selected certain common air pollutants that typically are associated with human activities in communities. These pollutants include carbon monoxide (CO), ozone (O_3), nitrogen oxide (NO_x), particulate matter smaller than 10 microns in diameter (PM_{10}), and sulfur dioxide (SO_2). The EPA established standards for each of these criteria pollutants to manage air quality across the country. The new standards will not become effective until the current ozone standard is met. Most states also have adopted standards for these pollutants. In some cases, the state standards are more stringent than EPA standards, to more precisely reflect local air quality conditions and planning objectives.

For many states, including California, air quality management includes dividing the state into distinct areas, or "air basins," based on meteorological and geographic conditions and,

Table 5.8-1. Ambient Air Quality Standards

			STANDARDS, AS PARTS PER MILLION		STANDARDS, AS MICROGRAMS PER CUBIC METER		VIOLATION CRITERIA	
Pollutant	Symbol	Averaging Time	California	Federal	California	Federal	California	Federal
Ozone	O_3	1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
		8 hours	—	0.08	—	160	---	If exceeded by 4th highest value during a 3-year period
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
		8 hours (Lake Tahoe only)	6	---	7,000	---	If exceeded	
Inhalable particulate matter	PM_{10}	Annual geometric mean	---	---	30	---	If exceeded	
		Annual arithmetic mean	---	---	---	50		If exceeded
		24 hours	---	---	50	150	If exceeded	If exceeded on more than 1 day per year
Fine particulate matter	$PM_{2.5}$	Annual arithmetic mean	---	---	---	15	---	If exceeded
		24 hours	---	---	---	65	---	If exceeded by 98th percentile over 3 years
Nitrogen dioxide	NO_2	Annual average	---	0.053	---	100	If exceeded	If exceeded
		1 hour	0.25	---	470	---		
Sulfur dioxide	SO_2	Annual average	---	0.03	---	80		If exceeded
		24 hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.25	---	655	---	If exceeded	
Lead particles	Pb	Calendar quarter	---	---	---	1.5	If equaled or exceeded	If exceeded
		30 days	---	---	1.5	---		
Sulfate particles	SO_4	24 hours	---	---	25	---	If equaled or exceeded	
Hydrogen sulfide	H_2S	1 hour	0.03	---	42	---	If equaled or exceeded	
Vinyl chloride	C_2H_3Cl	24 hours	0.010	---	26	---	If equaled or exceeded	

Notes:
All standards are based on measurements corrected to 25 degrees C and 1 atmosphere pressure.
Decimal places shown for standards reflect the rounding precision used for evaluating compliance.
National standards shown are the primary (health effects) standards.
Regulations implementing the national 8-hour ozone standard will not become effective until the 1-hour standard has been achieved.
Regulations implementing the national $PM_{2.5}$ standards will not be developed until 2005.

Sources:
California Air Resources Board 1997b; 40 CFR Part 50.

where possible, jurisdictional boundaries. In California, 15 air basins have been delineated for air quality management. The regulation of air quality within each air basin in California is carried out by individual air quality management agencies or pollution control districts.

In California, 15 air basins have been delineated for air quality management.

The EPA concluded that monitoring the level of criteria pollutants can help determine and manage the relative air quality in a particular area. If the levels of any of the criteria pollutants in a particular geographic area exceed the state or federal standards established for those pollutants, the area is designated as "nonattainment" for those pollutants. Likewise, if standards for pollutants are met in a particular area, the area is designated as "attainment" for those pollutants. In areas where standards may not have been established for certain criteria pollutants, the areas are considered "unclassified" for the pollutants.

The CAA also requires that nonattainment areas for criteria pollutants prepare and implement State Implementation Plans (SIPs) to achieve the standards.

The remainder of this section briefly discusses the existing air quality conditions with respect to air pollutants in the Program study regions. SO_2 is not discussed in this report because it is emitted primarily by industrial sources and is not considered a pollutant of concern in the study area, which is in attainment with state and federal standards for SO_2.

5.8.3.1 DELTA REGION

The Delta Region includes portions of the Sacramento Valley, San Joaquin Valley, San Francisco Bay, and Sacramento Valley Urban Air Basins. During summer, the Pacific high-pressure system can isolate the Delta Region from storms and create inversion layers in the lower elevations that prevent the vertical dispersion of air. Topographic barriers in the Delta Region also can act to prevent lateral dispersion. As a result, air pollutants in the region can become concentrated during summer months, lowering air quality. During winter, when the Pacific high-pressure system moves south, stormy, rainy weather intermittently dominates the Delta Region. Prevailing winter winds from the southeast disperse pollutants, often resulting in clear, sunny weather over most of the region.

Air pollutants in the Delta Region can become concentrated during summer months, lowering air quality.

5.8.3.2 BAY REGION

The Bay Region is in the San Francisco Bay Area Air Basin. This region has similar weather and pollutant dispersion patterns as the Delta Region, except that more rainfall occurs in the Bay Region during winter. In summer, the Pacific high-pressure system typically remains near the coast, diverting storms to the north. Subsidence of warm air can create frequent summer atmospheric temperature inversions that may be several hundred to several thousand feet deep, often trapping pollutants near the ground and degrading air quality.

Subsidence of warm air can create frequent summer atmospheric temperature inversions that trap pollutants near the ground and degrade air quality in the Bay Region.

Most of the rainfall in the region occurs during winter (November to April), after the Pacific high-pressure system has moved south. Winds during winter predominantly flow from the south and southeast, generally dispersing air pollutants and increasing air quality.

The San Francisco Bay Area Air Basin is currently a federally designated nonattainment area for CO, but a SIP has been prepared and is under EPA review. The basin is in attainment of federal standards for O_3, NO_X, and PM_{10} but does not attain state standards for O_3 or PM_{10}.

5.8.3.3 SACRAMENTO RIVER REGION

The Sacramento River Region includes portions of the Sacramento Valley, Northeast Plateau, Lake County, and Mountain Counties Air Basins. Upper watersheds and areas of the region in the Northeast Plateau, Lake County, and Mountain Counties Air Basins are characterized by warm days and cool nights in summer, and cool days and cold nights in winter. Relatively little precipitation occurs in the Northeast Plateau Air Basin area east of the mountains because of the rainshadow effect of the mountains. The Mountain Counties and Lake County Air Basins to the west receive considerably more precipitation, including appreciable snowfall in the higher elevations of the upper watersheds. Winds moving through both of these air basins from a variety of directions throughout the year tend to disperse air pollutants, resulting in relatively good air quality.

The Northeast Plateau Air Basin attains (or is unclassified for) state and federal standards for O_3, CO, and NO_x. For PM_{10}, the area attains (or is unclassified for) federal standards but is in nonattainment in Siskiyou and Modoc Counties for the state standard, which is more stringent than the federal standard. Upper watershed areas of the Sacramento River Region are located in Siskiyou, Modoc, and Lassen Counties in the Northeast Plateau Air Basin. Upper watershed areas in El Dorado, Placer, Nevada, Sierra, Plumas, and Butte Counties are in the Mountain Counties Air Basin. The Lake County and Mountain Counties Air Basins attain (or are unclassified for) both federal and state standards for all pollutants. Air quality problems in the Mountain Counties Air Basin include O_3 and PM_{10}. State O_3 standards are violated in all but the Plumas and Sierra Counties portion of the air basin. Federal O_3 standards are violated in the El Dorado and Placer Counties portion of the air basin. State PM_{10} standards are violated in most portions of the air basin. Federal PM_{10} standards are not violated in the Mountain Counties Air Basin.

The urbanized area in Sacramento County is a federally designated nonattainment area for PM_{10}. The entire basin is in nonattainment (federal and state standards) for CO and O_3.

For the portion of the region in the Sacramento Valley Air Basin, during summer, the Pacific high-pressure system can create inversion layers in the lower elevations that prevent the vertical dispersion of air. As a result, air pollutants in this portion of the region can become concentrated during summer, lowering air quality. During winter, when the Pacific high-pressure system moves south, stormy, rainy weather intermittently dominates the region. Prevailing winter winds from the southeast disperse pollutants, often resulting in clear, sunny weather and better air quality over most of this portion of the region.

The Sacramento Valley Air Basin is currently a federally and state-designated attainment area for NO_X. The urbanized area in Sacramento County is a federally designated nonattainment area for PM_{10}, but the remainder of the Sacramento Valley Air Basin attains the federal PM_{10} standard. The entire basin is in nonattainment (federal and state standards) for CO and O_3.

5.8.3.4 SAN JOAQUIN RIVER REGION

The San Joaquin River Region contains portions of the San Joaquin Valley, Mountain Counties, and San Francisco Bay Area Air Basins. With respect to that portion of the region that lies in the San Joaquin Valley Air Basin, in summer, when the Pacific high-pressure system moves north, no major storms or precipitation occur, creating daily inversion layers characterized by a layer of cool air over warm air. Surrounding mountains and upper watersheds of the region are at an elevation higher than that of summer inversion layers. As a result, the region is highly susceptible to pollutant accumulation over time. In winter, the influence of the Pacific high-pressure system moves south and gives rise to alternate periods of unsettled stormy weather and stable, rainless conditions with winds from the southwest. Most of the San Joaquin Valley is in the rainshadow of the Coast Ranges and depends on cold, unstable northwesterly flow for its precipitation, which produces showers following frontal passages.

The San Joaquin Valley Air Basin is currently a federally designated nonattainment area for CO, O_3, and PM_{10}; but the state has completed SIPs for each of these criteria pollutants, currently under review by EPA. The basin attains both state and federal NO_X standards.

The portion of the San Joaquin River Region that is in the Mountain Counties Air Basin (including Mariposa, Tuolumne, Calaveras, and Amador Counties) is characterized by warm days and cool nights in summer, and cool days and cold nights in winter. The area receives considerable precipitation, including appreciable snowfall in the higher elevations of the upper watersheds. Winds moving through this air basin from a variety of directions throughout the year tend to disperse air pollutants, resulting in relatively good air quality. The Mountain Counties Air Basin attains (or is unclassified for) both federal and state standards for all pollutants.

The San Joaquin Valley Air Basin is currently a federally designated nonattainment area for CO, O_3, and PM_{10}; but the state has completed SIPs for each of these criteria pollutants, currently under review by EPA.

With respect to the small portion of the San Joaquin River Region that is included in the San Francisco Bay Area Air Basin, in summer, the Pacific high-pressure system typically remains near the coast, diverting storms to the north. Subsidence of warm air can create frequent summer atmospheric temperature inversions that may trap pollutants near the ground and degrade air quality. Most of the rainfall in this portion of the region falls during winter (November to April), after the Pacific high-pressure system has moved south. Winds during winter predominantly flow from the south and southeast, generally dispersing air pollutants and increasing air quality.

5.8.3.5 OTHER SWP AND CVP SERVICE AREAS

The Other SWP and CVP Service Areas region includes two distinct, noncontiguous areas: in the north, are the San Felipe Division's CVP service area and the South Bay SWP service area; to the south, are the SWP service areas. The northern section of this region encompasses parts of the central coast counties of Santa Clara, San Benito, Santa Cruz, and Monterey. The southern portion includes parts of Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura Counties.

The SWP service area includes portions of the South Central Coast, South Coast and San Diego, and Mohave Desert and Salton Sea Air Basins. The CVP service area includes portions of the San Francisco Bay Area and North Central Coast Air Basins.

In the South Central Coast and the South Coast and San Diego Air Basins, the Pacific high-pressure system often stays near the coast during summer and can create inversion layers that prevent the vertical dispersion of air. As a result, air pollutants in this portion of the region can become concentrated during summer months, lowering air quality. During winter, when the Pacific high-pressure system moves south, stormy, rainy weather intermittently dominates the region. Prevailing winter winds from the southeast disperse pollutants, resulting in better air quality conditions over most of this portion of the region.

The South Central Coast Air Basin attains (or is unclassified for) state and federal standards for CO and NO_x but does not attain either the federal or state standard for O_3. For PM_{10}, the South Central Coast Air Basin attains (or is unclassified for) federal standards but is in nonattainment for the state standard. The South Coast and San Diego Air Basin attains state and federal standards for CO and NO_x. Because this latter basin does not attain either the federal or state standard for O_3, the district has submitted a SIP to EPA for approval. The South Coast and San Diego Air Basin also does not attain federal or state standards for PM_{10}.

The South Central Coast Air Basin attains (or is unclassified for) state and federal standards for CO and NO_x but does not attain either the federal or state standard for O_3. For PM_{10}, the South Central Coast Air Basin attains (or is unclassified for) federal standards but is in nonattainment for the state standard.

The Mojave Desert and Salton Sea Air Basin is characterized by warm days and cool nights in summer, and cool days and cold nights in winter. Most of the sparse annual rainfall in this portion of the region occurs during November to April.

Predominant winds out of the northwest in winter, spring, and fall, and out of the south in summer tend to disperse air pollutants, resulting in relatively good air quality. The Mojave Desert and Salton Sea Air Basin attains (or is unclassified for) state and federal standards for CO and NO_x but does not attain federal or state standards for O_3 and PM_{10}.

The North Central Coast Air Basin (NCCAB) is comprised of Monterey, Santa Cruz, and San Benito Counties. The basin lies along the central coast of California. The semi-permanent high-pressure cell in the eastern Pacific is the basic controlling factor in the climate of the air basin. In summer, air descends in the Pacific High, forming a stable

temperature inversion of hot air over a coastal layer of cool air. The warmer air aloft acts as a lid to inhibit vertical air movement, lowering air quality during summer.

In fall, the relatively stationary air mass is held in place by the Pacific High pressure cell, which allows pollutants to build up over a few days. It is most often during this season that the north or east winds develop to transport pollutants from either the San Francisco Bay Area or the Central Valley into the NCCAB.

During winter, the Pacific High migrates southward and has less influence on the air basin. The general absence of deep, persistent inversions and the occasional storm systems usually result in good air quality for the overall basin in winter and early spring.

The NCCAB attains (or is unclassified for) state and federal standards for CO, NO_2, and SO_2. For PM_{10}, the NCCAB attains (or is unclassified for) federal standards but is in non-attainment for state standards. For O_3, the NCCAB attains (or is unclassified for) federal standards but is in moderate non-attainment for state standards.

5.8.4 ASSESSMENT METHODS

The majority of air quality impacts would result from construction associated with Program activities. Because construction-related impacts would occur only during the period of construction, they are considered direct and short-term impacts. Air emissions of concern associated with construction include PM_{10} as fugitive dust, as well as CO and NO_X from construction vehicle exhaust.

The majority of air quality impacts would result from construction associated with Program activities.

Operations-related impacts from activities such as pumping operations, changes in agricultural activities, and traffic and boating activities associated with recreational use of expanded storage reservoirs also could result in changes to air quality. Operations-related air quality impacts are considered indirect and long-term. Air emissions of concern associated with these activities include PM_{10}, CO, and NO_X (dust and exhaust emissions), as well as emissions from herbicides and pesticides used in agriculture.

In 1997, legislation was enacted directing EPA to develop new standards to address particulate matter smaller than 2.5 microns in diameter ($PM_{2.5}$). These standards go into effect in 2005; however, a satisfactory way of monitoring compliance with new standards has not been developed. Future site-specific projects may need to comply with $PM_{2.5}$ standards.

5.8.5 SIGNIFICANCE CRITERIA

The criteria used to evaluate potential air quality impacts are based on standardized air emission levels.

Potential air quality impacts are considered potentially significant if the construction or operations of facilities associated with a particular implementation alternative or Program element would cause substantial adverse changes to the existing (ambient) air quality conditions in the affected area. The range of such changes includes producing emissions that would either on their own or when combined with existing emissions:

- Violate federal or state ambient air quality standards
- Cause a lowering of attainment status
- Conflict with adopted air quality management plan policies or programs

5.8.6 NO ACTION ALTERNATIVE

Existing trends in air quality can reasonably be expected to continue if no action is taken. Under the No Action Alternative, total air emissions are expected to increase over existing conditions, even assuming that emissions allowable from individual and mobile sources would be regulated more strictly.

Under the No Action Alternative, total air emissions are expected to increase over existing conditions, even assuming that emissions allowable from individual and mobile sources would be regulated more strictly.

5.8.7 CONSEQUENCES: PROGRAM ELEMENTS COMMON TO ALL ALTERNATIVES

For air quality, the environmental consequences of the Ecosystem Restoration, Water Quality, Levee System Integrity, Water Use Efficiency, Water Transfer, and Watershed Programs, and Storage elements are similar under all Program alternatives, as described below. The environmental consequences of the Conveyance element vary among Program alternatives, as described in Section 5.8.8.

5.8.7.1 DELTA REGION

Ecosystem Restoration Program

The installation of new fish screens could cause construction-related air quality impacts in the Delta Region. This impact is considered potentially significant. Mitigation is available to reduce the impact to a less-than-significant level.

Development of wetlands would involve activities that could cause construction-related air quality impacts. Increasing wetland vegetation could result in a continuous increase in methane gas emissions due to the natural anaerobic decay of the associated vegetation. This increase is considered less than significant.

Increasing wetland vegetation could result in a continuous increase in methane gas emissions due to the natural anaerobic decay of the associated vegetation.

Water Quality and Watershed Programs

The Water Quality and Watershed Programs are not expected to affect air quality in the Delta Region.

Levee System Integrity Program

Setback areas associated with improved levees and flood control operations could result in decreased emissions for lands previously in active agricultural use. Improvement of existing levee systems and construction of new levees, as well as dredging, would result in construction-related air quality impacts.

Water Use Efficiency Program

Modification of existing filtration plants; development of new pipelines, well fields, and pump stations; and increased or decreased pumping activities could result in construction- and operations-related air quality impacts (both adverse and beneficial) in agricultural and urban environments. Potentially significant adverse impacts can be mitigated to less-than-significant levels.

Proposed Water Use Efficiency Program facilities could result in construction- and operations-related air quality impacts.

Increased use in the agricultural sector of pressurized irrigation systems could create a greater reliance on fossil fuels or other energy sources. The increase could adversely affect air quality either locally (with fossil fuels) or regionally if energy is provided from out-of-region facilities. Changes in cultivation practices to accompany increased water use efficiency could result in adverse or beneficial impacts. Potentially significant impacts can be mitigated to less-than-significant levels.

Water Transfer Program

The Water Transfer Program could affect air quality primarily through changes in crop type or agricultural acreage. The extent of impacts depends on the source of water and the timing, magnitude, and pathway of each transfer.

The Water Transfer Program could affect air quality primarily through changes in crop type or agricultural acreage.

Potential beneficial air quality impacts are associated with the origin of the transferred water. The benefits resulting from crop fallowing include reduced fugitive dust production and reduced air emissions from declining use of equipment and agricultural chemicals. However, temporary land fallowing can increase the potential for barren soils to be eroded by wind if no cover crop or crop residue remains in the field. Transfers based on crop shifting can reduce the need to burn stubble (typically associated with grain crops, especially rice).

Potentially significant adverse impacts primarily are associated with the destination of the transferred water. Increased cultivation may increase fugitive dust. Increases in equipment use and cultivation, agricultural chemical use, and crop shifting and burning may increase emissions. Mitigation is available to reduce potentially significant impacts to less-than-significant levels.

Storage

Potentially significant adverse air quality impacts may be associated with construction of any storage facilities. These projects could be of sufficient magnitude that construction-related pollutants of concern (NO_X, CO, and PM_{10}) may occur at levels exceeding ambient air quality standards for extended periods, thereby potentially contributing significantly to regional air quality degradation. The actual extent to which the construction of the storage facilities would contribute to regional air pollution can be determined only when specific project locations for the storage facilities are identified. Mitigation is available to reduce potentially significant adverse impacts to less-than-significant levels.

The actual extent to which the construction of the storage facilities would contribute to regional air pollution can be determined only when specific project locations for the storage facilities are identified.

The operations-related impacts associated with in-Delta storage features are not expected to be significant.

Facility operation and maintenance activities are not considered potentially significant sources of air pollutant emissions. Recreational use of an enlarged reservoir could result in traffic and boating emissions that also are considered less than significant.

5.8.7.2 BAY REGION

Ecosystem Restoration and Levee System Integrity Programs

Ecosystem Restoration and Levee System Integrity Program impacts would be similar to those discussed for the Delta Region and would be focused in the Suisun Marsh, but the magnitude of the impacts would be less because fewer projects are planned for the Bay Region.

Water Quality, Water Transfer, and Water Use Efficiency Programs

The Water Quality, Water Transfer, and Water Use Efficiency Programs are not expected to affect air quality in the Bay Region.

Watershed Program

Prescribed burning programs in upper and lower watershed areas are potentially significant sources of O_3 precursor emissions and PM_{10} emissions. If federal land management agencies undertake new prescribed burning programs, the programs may require evaluation for compliance with EPA CAA conformity regulations. Continuation of existing prescribed burning programs normally would be exempt from CAA conformity requirements. Mitigation is available to reduce potentially significant adverse impacts to less-than-significant levels.

Prescribed burning programs in upper and lower watershed areas are potentially significant sources of O_3 precursor emissions and PM_{10} emissions.

Vehicle travel and construction activities associated with erosion control and habitat restoration programs would result in minor quantities of O_3 precursor and PM_{10} emissions that are considered less than significant.

Storage

No storage facilities would be developed in the Bay Region; therefore, no impacts on air quality in the region are associated with the Storage Program.

5.8.7.3 SACRAMENTO RIVER AND SAN JOAQUIN RIVER REGIONS

Ecosystem Restoration, Water Use Efficiency, Water Transfer, and Watershed Programs

Activities associated with implementation of the Ecosystem Restoration, Water Use Efficiency, Water Transfer, and Watershed Programs would be similar to those discussed previously for the Delta and Bay Regions. Additionally, river channel deepening and subsidence reversal activities could cause air pollutant emissions during construction. Air emissions from operation of diesel- and gasoline-powered equipment include O_3 precursors (non-methane organic gas [NMOG], volatile organic compounds [VOCs], and NO_x), PM_{10}, CO, and toxic air contaminants. These impacts are considered potentially significant but can be mitigated to less-than-significant levels.

River channel deepening and subsidence reversal activities could cause air pollutant emissions during construction.

Water Quality Program

Land conversion activities intended to reduce drainage-related pollution could result in decreased operations-related emissions, especially for lands previously under active agricultural cultivation. Revegetation of previously cultivated lands would reduce potential fugitive dust (PM_{10}) and exhaust emissions (NO_X and CO) from operation of farm equipment.

Revegetation of previously cultivated lands would reduce potential fugitive dust (PM_{10}) and exhaust emissions (NOX and CO) from operation of farm equipment.

Retirement of existing agricultural lands could result in long-term beneficial air quality impacts associated with decreases in emissions from preparing agricultural land, burning fossil fuels, and applying herbicides and pesticides. Potentially significant adverse impacts that could result from land conversion include increased fugitive emissions of wind-blown dust (if land was left as unvegetated, fallowed land) and increased emissions (if land was developed for residential, commercial, or recreational uses). These impacts can be mitigated to less-than-significant levels.

Improvement of existing and construction of new filtration and treatment facilities as part of the Water Quality Program could result in construction- and operations-related air quality impacts. These impacts are considered less than significant.

Storage

The impacts on air quality in the Sacramento River and San Joaquin River are similar to those described for the Delta Region.

5.8.7.4 Other SWP and CVP Service Areas

All Programs

No direct effects on air quality from Program actions are anticipated in the Other SWP and CVP Service Areas. Because of the programmatic nature of this document, the indirect impacts of potential growth on air quality are unknown and therefore cannot be analyzed.

5.8.8 CONSEQUENCES: PROGRAM ELEMENTS THAT DIFFER AMONG ALTERNATIVES

For air quality resources, the Conveyance element results in environmental consequences that differ among the alternatives, as described below.

5.8.8.1 Preferred Program Alternative

This section includes a description of the consequences of a pilot diversion project. If the pilot project is not built, these consequences would not be associated with the Preferred Program Alternative.

Direct short-term air pollutant emissions would accompany construction of new facilities.

Construction-related pollutants of concern (NO_X, CO, and PM_{10}) may exceed ambient air quality standards for short, intermittent periods during construction but are not expected to result in sufficient quantities to significantly contribute to regional air quality degradation. Depending on the extent and duration of construction activities, these impacts could be potentially significant; however, mitigation is available to reduce impacts on air quality to less-than-significant levels.

Construction-related pollutants of concern (NO_X, CO, and PM_{10}) may exceed ambient air quality standards for short, intermittent periods during construction.

Increases in NO_x and CO could result from electrical power generation required to operate new and existing pumps at increased capacities. Potential changes in energy use at the pumping facilities also may indirectly affect air quality at thermal power generation plants; however, these changes are not expected to result in potentially significant impacts.

Construction of new facilities also would involve operations-related air quality impacts. Potential operations-related air quality impacts are expected to be less than significant.

5.8.8.2 ALTERNATIVE 1

Impacts on air quality under Alternative 1 would be similar to those described for the Preferred Program Alternative, without the impacts associated with a pilot diversion facility near Hood and enlargement of the Mokelumne River channel.

5.8.8.3 ALTERNATIVE 2

Construction-related impacts on air quality under Alternative 2 would be similar to those described for the Preferred Program Alternative.

5.8.8.4 ALTERNATIVE 3

Construction-related impacts on air quality under Alternative 3 would exceed those of the Preferred Program Alternative because more construction would be required for an isolated facility.

5.8.9 PROGRAM ALTERNATIVES COMPARED TO EXISTING CONDITIONS

This section presents the comparison of the Preferred Program Alternative and Alternatives 1, 2, and 3 to existing conditions. This programmatic analysis found that the potentially beneficial and adverse impacts from implementing any of the Program

alternatives when compared to existing conditions were the same impacts as those identified in Sections 5.8.7 and 5.8.8, which compare the Program alternatives to the No Action Alternative.

The analysis indicates no potentially significant adverse or beneficial impacts on air quality resources when the Program alternatives are compared to existing conditions. As population levels and demand would not increase under existing conditions, air quality impacts would be slightly higher under existing conditions than under the No Action Alternative. At the programmatic level, however, these differences would not be significant.

As population levels and demand would not increase under existing conditions, air quality impacts would be slightly higher under existing conditions than under the No Action Alternative.

At the programmatic level, the comparison of the Program alternatives to existing conditions did not identify any additional potentially significant environmental consequences than were identified in the comparison of Program alternatives to the No Action Alternative.

The following potentially significant air quality impacts are associated with the Preferred Program Alternative:

- Direct, short-term air pollutant emissions during construction activities.
- Increased fugitive emissions of wind-blown dust.
- Increased fugitive emissions of wind-blown dust from unvegetated, fallowed land; shifts to crops associated with drier topsoil; or changes in cultivation practice.
- Increased emissions associated with prescribed burning programs.
- Increased emissions from increases in equipment use and cultivation, agricultural chemical use, and crop shifting and burning.
- Increased emissions if land use changes lead to higher residential, commercial, or recreational uses.
- Increased use of fossil fuels or other energy resources associated with pressurized irrigation systems.

No potentially significant unavoidable impacts on air quality are associated with the Preferred Program Alternative.

5.8.10 ADDITIONAL IMPACT ANALYSIS

Cumulative Impacts. For a summary comparison of cumulative impacts for all resource categories, please refer to Chapter 3. A description of the projects and programs contributing to this cumulative impacts analysis can be found in Attachment A.

For all regions, the Other SWP and CVP Service Areas, Program actions and the projects listed in Attachment A cause construction-related air quality impacts, mostly associated with water management projects and urbanization. The air quality impacts would depend largely on the timing of the various construction projects. Actions under the Preferred Program Alternative could be coordinated with present and proposed projects, thereby reducing the extent of the cumulative impacts.

Actions under the Preferred Program Alternative could be coordinated with present and proposed projects, thereby reducing the extent of the cumulative impacts.

Mitigation strategies have been identified that may reduce impacts associated with Program actions and the projects listed in Attachment A. Nevertheless, cumulative impacts on air quality are considered potentially significant.

Growth-Inducing Impacts. If the Preferred Program Alternative improves water supply, it could induce growth, depending on how the additional water supply was used. If the additional water was used to expand agricultural production or urban housing development, the proposed action would foster economic and population growth. Expansion of agricultural production and population could affect air quality resources, the nature of which would depend on where economic or population growth occurred and how it was managed.

If the Preferred Program Alternative improves water supply, it could induce growth, depending on how the additional water supply was used.

Short- and Long-Term Relationships. Generally, implementing the Preferred Program Alternative would not result in any potentially significant short- or long-term adverse impacts on air quality resources.

Most short-term impacts would be related to construction and would cease when construction is complete. Where possible, avoidance and mitigation measures would be carried out as a standard course of action to lessen impacts on air quality. No potentially significant long-term unavoidable impacts on air quality are associated with the Preferred Program Alternative.

Most short-term impacts would be related to construction and would cease when construction is complete.

Irreversible and Irretrievable Commitments. No irreversible or irretrievable commitments of air quality resources are associated with the Preferred Program Alternative.

5.8.11 MITIGATION STRATEGIES

These mitigation strategies will be considered during specific project planning and development. Specific mitigation measures will be adopted, consistent with the Program goals and objectives and the purposes of site-specific projects. Not all mitigation strategies will be applicable to all projects because site-specific projects will vary in purpose, location, and timing.

The following mitigation strategies can be used, as required, to reduce emissions of pollutants of concern. Measures to avoid impacts include:

- Setting traffic limits on construction vehicles.

- Maintaining properly tuned equipment.
- Limiting the hours of operation or amount of equipment.
- Limiting the use of agricultural chemicals.
- Coordinating prescribed burning programs with relevant air quality management agencies to ensure that the programs are accounted for in state and federal air quality management plans.

Measures to minimize impacts include:

- Regular, periodic watering of construction sites to control levels of dust in the air.
- Using soil stabilizers and dust suppressants on unpaved service roadways.
- Daily contained sweeping of paved surfaces.
- Limiting vehicle idling time.
- Using alternatively fueled equipment.
- Requiring selection of borrow sites that are closest to fill locations.
- Implementing construction practices that reduce generation of particulate matter.
- Hydroseeding and mulching exposed areas.
- Using cultivating practices that minimize soil disturbance.
- Following air basin management plans to avoid or minimize vehicle-related emissions.
- Restricting the kinds of recreational vehicles or the times of operation for certain off-road vehicles on fallowed agricultural land to limit the amount of fugitive dust.

5.8.12 POTENTIALLY SIGNIFICANT UNAVOIDABLE IMPACTS

No potentially significant unavoidable impacts on air quality were identified for the Preferred Program Alternative.

No potentially significant unavoidable impacts on air quality were identified for the Preferred Program Alternative.