3.2 AIR QUALITY

As a result of the Initial Study,[1] the City of Pasadena determined that the Arroyo Seco Master Plan Project (proposed project) had the potential to result in impacts to air quality. Therefore, this issue was carried forward for detailed analysis in this Master Environmental Impact Report (Master EIR). This analysis was undertaken to identify opportunities to avoid, reduce, or otherwise mitigate potential significant impacts to air quality. This analysis considers air quality impacts that could occur from all phases of the proposed project and air pollutant sources related to the project, including construction activities and operation.

The analysis of air quality includes a description of the regulatory framework that guides the decision-making process, existing conditions of the proposed project area, thresholds for determining if the proposed project will result in significant impacts, anticipated impacts, mitigation measures, and level of significance after mitigation. The potential for impacts on air quality has been analyzed in accordance with the methodologies, provided by the South Coast Air Quality Management District (SCAQMD) in the *California Environmental Quality Act (CEQA) Air Quality Handbook*[2] and Appendix B, Arroyo Seco Master Plan Air Quality Report.

3.2.1 Regulatory Framework

This regulatory framework identifies the federal and state laws that govern the protection of air quality and must be considered by the City of Pasadena when regarding decisions on projects that involve construction, operation, or maintenance activities that will result in air emissions. All public and private projects in the City of

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[1] City of Pasadena, 2000c. *Initial Study Arroyo Seco Mater Plan Project.* Prepared by: Sapphos Environmental, Inc., 133 Martin Alley, Pasadena, CA 91105. Contact: Department of Planning and Permitting, 175 North Garfield, Pasadena, CA 91109.

[2] South Coast Air Quality Management District, January 1993. *CEQA Air Quality Handbook.* Contact: 21865 East Copley Drive, Diamond Bar, CA 91765.

Pasadena that involve the construction, modification, or operation of a facility or equipment that might emit pollutants from a stationary source into the atmosphere must obtain an Authority to Construct from the South Coast Air Quality Management District.

Responsibility for attaining and maintaining ambient air-quality standards in California is divided between the California Air Resources Board (CARB) and regional air-pollution control or air-quality management districts. Areas of control for the regional districts are set by CARB, which divides the state into air basins, based largely on topography that facilitates or limits airflow across or within county boundaries. The nondesert portions of Los Angeles, San Bernardino, and Riverside Counties, together with all of Orange County, comprise the South Coast Air Basin (SCAB), which is controlled by South Coast Air Quality Management District (SCAQMD).

Air quality in the SCAB is regulated by federal, state, and regional control authorities. The U.S. Environmental Protection Agency (EPA) is involved in local air-quality planning through the Federal Clean Air Act (Federal CAA), as amended in 1990. In California, the Lewis Air Quality Management Act (originally adopted in 1976 and substantially amended in 1987) and the California Clean Air Act (California CAA) of 1988 set air-quality planning and regulatory responsibilities for the SCAB. The California Air Resources Board (CARB) is responsible for coordinating state-wide planning and control efforts and for conducting research on air-pollution problems. At the regional level, the SCAQMD and the Southern California Association of Governments (SCAG) are responsible for preparing the Air Quality Management Plan (AQMP), which contains measures to meet federal and state requirements. When approved by CARB and the Federal EPA, the AQMP becomes part of the State Implementation Plan (SIP) for the SCAB. The 1994 SIP for Ozone was approved by the EPA in 1996 and is the governing SIP for this region.

FEDERAL

National Environmental Policy Act

Elements of the Arroyo Seco Master Plan Project could potentially be funded by federal grant monies. The National Environmental Policy Act (NEPA) and its supporting federal regulations establish certain requirements that must be adhered to for any project "...financed, assisted, conducted or approved by a federal agency...." In making a decision on the issuance of federal grant monies for elements of the Arroyo Seco Master Plan Project, the federally designated lead agency pursuant to NEPA is required to "...determine whether the proposed action may significantly affect the quality of the human environment."

Federal Clean Air Act

The federal EPA sets National Ambient Air Quality Standards (NAAQS). Existing national standards are shown in Table 3.2.1-1, *Ambient Air Quality Standards,* together with state standards. Air quality in the United States is determined for six common pollutants by measurement of the concentration of these pollutants in ambient air (air located in areas of public access). There are six federal criteria pollutants for which ambient standards have been established: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10}), and lead (Pb). In July 1997, the EPA promulgated stricter standards for ozone and fine particulate matter ($PM_{2.5}$). However, deadlines for attaining the standards were extended over original proposals, with up to 15 years allowed for attaining the $PM_{2.5}$ standard. The PM_{10} standard was revised, but the existing PM_{10} standard remains in effect until attainment is achieved. Until there has been sufficient monitoring for the EPA to designate the $PM_{2.5}$ attainment status for each region, the PM_{10} standard will remain the particulate standard of reference. However, federal enforcement of the new standards is currently on hold pending the outcome of an appeal by EPA of a 2-to-1 decision by a 3-judge panel of the U.S. Court of Appeals for the District of Columbia on May 14, 1999. This decision removed the revised federal PM_{10} standard, put a hold on implementing the 8-hour ozone standard, and asked for further comments on the $PM_{2.5}$ standard.

The 1990 Amendments to the federal CAA divided the nation into five categories of planning regions, depending on the severity of each region's pollution, and set new timetables for attaining the national ambient air-quality standards. The categories range from "marginal" to "extreme." Attainment deadlines are from 3 to 20 years, depending on the category. The SCAB is the only region in the nation classified as an "extreme" O_3 nonattainment area. For areas designated as "extreme," Section 181 of the CAA sets the O_3 attainment deadline at 2010. Federal deadlines for attaining CO and PM_{10} standards in this region are 2000 and 2005, respectively.

Section 182(e)(5) of the CAA allows the EPA Administrator to approve provisions of an attainment strategy in an "extreme" area that anticipates development of new control techniques or improvement of existing control technologies if such provisions are not needed to achieve required incremental reductions to the year 2000; and the State has submitted enforceable commitments to develop and adopt contingency measures to be implemented if the anticipated technologies do not achieve planned reductions.

The EPA can withhold certain transportation funds from states that fail to comply with the planning requirements of the Act. If a state fails to correct these planning deficiencies within two years of federal notification, the EPA is required to develop a Federal Implementation Plan (FIP) for the identified nonattainment areas.

TABLE 3.2.1-1
AMBIENT AIR QUALITY STANDARDS

AIR POLLUTANT	NATIONAL		STATE
	PRIMARY	SECONDARY	
Ozone (O_3)	>0.12 ppm, 1-hr avg.	>0.12 ppm, 1-hr avg.	>0.09 ppm, 1-hr avg.
Carbon Monoxide (CO)	= 9.5 ppm, 8-hr. avg. >35 ppm, 1-hr. avg.	= 9.5 ppm, 8-hr. avg. >35 ppm, 1-hr. avg.	>9.0 ppm, 8-hr. avg. >20 ppm. 1-hr. avg.
Nitrogen Dioxide (NO_2)	>0.0534 ppm, annual avg.	>0.0534 ppm, annual avg.	>0.25 ppm, 1-hr. avg.
Sulfur Dioxide (SO_2)	>0.03 ppm, annual avg. >0.14 ppm, 24-hr. avg.	>0.50 ppm, 3-hr. avg.	>.25 ppm 1-hr >0.04 ppm, 24-hr avg.
Suspended Particulate Matter (PM_{10})	>150 µg/m³, 24-hr avg. >50 µg/m³ AAM	>150 µg/m³, 24-hr avg. >50 µg/m³ AAM	>50 µg/m³, 24-hr. avg. >30 µg/m³ AGM
Sulfates (SO_4)	---	---	>25 µg/m³, 24-hr avg.
Lead (Pb)	>1.5 µg/m³, calendar quarter	>1.5 µg/m³, calendar quarter	>1.5 µg/m³, monthly avg.
Hydrogen Sulfide (H_2S)	---	---	>0.03 ppm, 1-hr avg.
Vinyl Chloride	---	---	>0.010 ppm, 24-hr avg.
Visibility-Reducing Particles	---	---	Insufficient amount to reduce prevailing visibility to less than 10 miles at relative humidity less than 70%, 1 observation

SOURCE: *SCAQMD 1998 Air Quality Data*

NOTE: ppm = parts per million by volume
> = greater than
= = greater than or equal to
$\mu g/m^3$ = micrograms per cubic meter
AAM = annual arithmetic mean
AGM = annual geometric mean

STATE

California Clean Air Act

Standards: The California CAA of 1988 requires all air-pollution control districts in the state to endeavor to achieve and maintain state ambient air-quality standards for O_3, CO, sulfur dioxide (SO_2), and NO_2 by the earliest practicable date and to develop plans and regulations specifying how they will meet this goal. There are no planning requirements for the state PM_{10} standard. California's ambient air standards are generally stricter than national standards for the same pollutants, but there is no penalty for nonattainment. California has also established state standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles, for which there are no national standards (Table 3.2.1-1).

Attainment Categories: Based on pollutant levels, the California CAA divides ozone nonattainment areas into four categories—moderate, serious, severe, and extreme—to which progressively more stringent requirements apply. The SCAB is classified as the state's only extreme ozone nonattainment area. Similarly, the California CAA divides carbon monoxide nonattainment areas into two categories: moderate and serious. The SCAB is designated as a serious nonattainment area for carbon monoxide.

CARB has also designated the SCAB nonattainment areas based on the state NO_2 and PM_{10} ambient air standards, but these are not subdivided by the state on the basis of the severity of the pollution. Nonattainment areas were required to adopt plans in 1991 to meet state standards and to revise these plans every three years. The SCAQMD revised its state attainment plan in 1994 when it prepared its federal ozone attainment plan. Each district plan must achieve a 5 percent annual reduction, averaged over consecutive three-year periods, in district-wide emissions of each nonattainment pollutant or its precursors unless, despite the inclusion of all feasible measures in the plan and an expeditious adoption schedule, the area is not able to achieve the required 5 percent annual reduction.

Unlike the Federal CAA, the California CAA has no attainment deadlines. The CARB has authority under Section 41503.2 of the California Health and Safety Code to revise deficient district plans, as needed, following extensive notification and hearing procedures.

REGIONAL

Air Quality Management Plan

The SCAQMD is responsible for formulating and implementing the AQMP for the SCAB, in which the City of Pasadena lies. Designated portions of an AQMP, which is prepared or subsequently revised to comply with the national ambient air standards, are submitted to CARB for incorporation in the SIP with plans and regulations from other air-quality management and air-pollution control districts in the state. Because air-quality plans are prepared to meet both California CAA and Federal CAA requirements, they might be broader than federal requirements in certain respects.

The SCAQMD adopted the current AQMP on September 9, 1994, which relies on yet-to-be-developed technological controls, as permitted by the Federal CAA, to project attainment of the national ozone standard by 2010. The SCAQMD adopted a plan for attaining the national PM_{10} standards in November 1996. This revision also amended the ozone attainment plan, finding that with new modeling the region could attain the existing ozone and PM_{10} standards with fewer emission reductions than projected in previous AQMPs.

South Coast Air Quality Management District Rules and Regulations

Some SCAQMD rules and regulations, particularly Rule 402, Nuisance, and Rule 403, Fugitive Dust, might apply to projects during construction. Rule 402 states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other material that causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. Rule 403, which restricts emissions of fugitive dust, applies primarily to controlling emissions during construction and specifies mitigation measures to reduce sources of fugitive dust.

West San Gabriel Valley Air Quality Plan

Under the AQMP, local governments are responsible for implementing the transportation and land-use measures identified in that document. As air quality transcends jurisdictional boundaries, regional plans can help cities coordinate their efforts, thus enhancing the effectiveness of their individual air-quality plans and policies. For this reason, and with funding from the SCAQMD, 16 cities within the West San Gabriel Valley agreed to participate in the preparation of a regional air-quality plan. The plan, titled the *West San Gabriel Valley Air Quality Plan* (*WSGVAQP*), consists of 55 policies that cover the following 11 separate issues that are relevant to the consideration of the construction, operation, and maintenance of the Arroyo Seco Master Plan.

- Interjurisdictional Communication and Cooperation
- Public Participation and Education
- Land Use – Transportation Balance
- New Emission Control Technologies
- Commute Trip Reductions
- Noncommute Trip Reductions
- Circulation Improvements
- Air-Source Controls

?? Energy Conservation
?? Waste Management
?? Tax Policy

The plan is intended to be a guide for the participating cities: each of the member cities can decide whether to adopt the plan or adopt portions of the plan. Certain policies were identified as "core policies," which, if adopted by all member cities, would increase the effectiveness of the plan. Policy 42 of the WSGVAMP recommends that particulate emissions for construction equipment traveling on roadways be regulated. This recommendation is relevant to the construction phases of the Arroyo Seco Master Plan.

LOCAL

City of Pasadena Comprehensive General Plan

The City of Pasadena requires that sensitive receptors must be afforded special consideration in the evaluation of potential impacts related to air quality. The City of Pasadena has adopted the identification of sensitive receptors developed by the Bay Area Association of Governments, Table 3.2.1-2, *Sensitive Receptors of Air Contaminants.*

TABLE 3.2.1-2
SENSITIVE RECEPTORS OF AIR CONTAMINANTS

Receptor Group	Land Use Category
Children	Residences, schools, playgrounds, child care centers
Elderly	Residences, retirement homes, convalescent homes

Acutely ill	Hospitals, clinics
Chronically ill	Convalescent homes, residences
SOURCE: Bay Area Association of Governments	

Relevant Policies of the "Land Use and Mobility Elements" of *The City of Pasadena Comprehensive General Plan* are as follows:

Mobility Element

?? Increase the Availability and Use of Transit

Develop Strategies to Maximize Use of Light Rail
Expand Regional Bus Service
Expand Local Bus Service
Provide Priority Treatment for Transit Vehicles
Decrease Reliance on Automobiles

?? Increase the Use of Bicycling and Walking

Provide Enhanced Bicycle Facilities
Improve Pedestrian Environment

?? Reduce the Level of Vehicular Trips in General, and Specifically the Use of Autos for Drive-
Alone Trips

Develop Parking - Supply Programs
Develop Parking - Pricing Programs

?? Reduce Adverse Impacts to Through Traffic and Control Flows into Designated Corridors

Smart Corridor
Reduce Auto Traffic on Certain Streets
Protect Neighborhoods

3.2.2 Existing Conditions

Overall air quality has improved considerably throughout the Basin since 1990. In that year, the peak ozone concentration at the Pasadena monitoring station was 0.26 ppm and the state ozone standard was exceeded 118 times. In 2000, the peak reading at that same station was 0.16 ppm and the state standard was exceeded 19 times. These improvements have occurred despite extensive population growth in the SCAB during the past decade.

The City of Pasadena is located in Source Receptor Area (SRA) 8. Readings for SRA 8 for the past five years, together with the applicable state and national standards, are shown in Table 3.2.2-1, *Summary of Air Quality Data West San Gabriel Valley (SRA 8) Air Monitoring Station*.

Summary of Existing Air Quality

Ozone concentrations have remained relatively in SRA 8 over the past five years. Overall, there has been a significant decline in the number of days exceeding the state standard. Carbon monoxide concentrations are below state and national standards, but are relatively unchanged over the past five years. PM_{10} and $PM_{2.5}$ are not monitored in SRA 8. Readings are from SRA 9 in the East San Gabriel Valley. Particulate matter concentrations are affected by meteorology, which accounts for year-to-year variations. There is little overall change.

SUMMARY OF AIR QUALITY DATA WEST SAN GABRIEL VALLEY (SRA 8)
AIR MONITORING STATION

Pollutant Standards	1996	1997	1998	1999	2000
Ozone (O_3)					
State standard (1-hr. avg. 0.09 ppm)					
National standard (1-hr avg. 0.12 ppm)					
National standard (8-hr avg 0.08 ppm)					
Maximum 1-hr concentration (in ppm)	0.17	0.14	0.17	0.12	0.16
Maximum 8-hr concentration (in ppm)	NM	0.11	0.14	0.10	0.13
Number of days state standard exceeded	54	24	31	15	19
Number of days national 1-hr standard exceeded	17	5	14	0	7
Number of days national 8-hr standard exceeded	NM	8	17	4	14
Carbon Monoxide (CO)					
State standard (1-hr. avg. 20 ppm)					
National standard (1-hr avg. 35 ppm)					
State standard (8-hr. avg. 9.0 ppm)					
National standard (8-hr avg. 9 ppm)					
Maximum concentration 1-hr period (in ppm)	11	8	8	9	8
Maximum concentration 8-hr period (in ppm)	7.1	6	6.3	6.6	6.1
Number of days state/nat'l 1-hr standards exceeded	0	0	0	0	0
Number of days state/nat'l 8-hr standard exceeded	0	0	0	0	0
Nitrogen Dioxide (NO_2)					
State standard (1-hr avg. 0.25 ppm)					
National standard (0.0534 AAM in ppm)					
Annual arithmetic mean (in ppm)	.00378	0.0341	0.0351	0.0379	0.0296
Percent national standard exceeded	0	0	0	0	0
Maximum 1-hr concentration	0.19	0.17	0.16	0.16	0.17
Number of days state 1-hr standard exceeded	0	0	0	0	0
Suspended Particulates (PM_{10})[1]					
State standard (24-hr. avg. 50 ? g/m³)					
National standard (24-hr avg. 150 ? g/m³)					
Maximum 24-hr concentration	100	116	87	103	94
Percent samples exceeding state standard	41	40	28	35	42
Percent samples exceeding national standard	0	0	0	0	0
Suspended Particulates ($PM_{2.5}$)					
National standard (24-hr avg. 65 ? g/m³)					
Maximum 24-hr concentration	NM	NM	NM	73	66
Percent samples exceeding national standard				1	1

[1] SR 9 East San Gabriel Valley (PM_{10} not monitored in SRA 8)

ppm = parts per million

? g/m³ = micrograms per cubic meter

3.2.3 Significance Thresholds

The City of Pasadena relies on significance thresholds recommended by SCAQMD in its *CEQA Air Quality Handbook*[3]. The SCAQMD is currently in the process of preparing a new Air Quality Handbook, to be titled the *AQMD Air Quality Analysis Guidance Handbook*. Chapters 2, 3 and 4 related to air quality background information and the roles of regulatory agencies are available on the SCAQMD's Web site.[4] Other chapters will be posted on the Web page as they become available. Revisions at the time this analysis was prepared do not include new significance thresholds or analysis methodologies. The SCAQMD's emission thresholds apply to all federally regulated air pollutants except lead, which is not exceeded in the SCAB. Construction and operational emissions are considered to be significant if they exceed the thresholds established by the SCAQMP (Table 3.2.3-1, *Emission Thresholds of Significance*).

TABLE 3.2.3-1
EMISSION THRESHOLDS OF SIGNIFICANCE

[3] South Coast Air Quality Management District, January 1993.

[4] South Coast Air Quality Management District, 6 April 2002. *Current Air Quality and Trends; 1998 Air Quality.* Available at: http://www.aqmd.gov/smog/aqscr98.htm.

Pollutant	Construction		Operations
	pounds/day	tons/quarter	pounds/day
Carbon Monoxide (CO)	550	24.75	550
Sulfur Oxides (SO_x)	150	6.75	150
Nitrogen Oxides (NO_x)	100	2.5	55
Particulate Matter (PM_{10})	150	6.75	150
Volatile organic compounds (ROC)	75	2.5	55
SOURCE: South Coast Air Quality Handbook, 1993.			

Appendix C of the State *CEQA* Guidelines recommends consideration of five standards when considering the potential for significant impacts to air quality:

- Conflict with or obstruct implementation AQMP for the SCAB and conflict with Policy 42 of the WSGVAQMP.

- Violate the NAAQS established by the federal EPA, violate ambient air quality standards established for California, or exceed emission thresholds of significance established by the SCAQMD.

- Result in cumulatively considerable net increase in O_3, CO, NO_2, SO_x, PM_{10}, or volatile organic compounds. CO concentrates in an area that already exceeds national or state standards are considered significant if the increase exceeds one part per million (ppm) averaged over one hour or 0.45 ppm averaged over eight hours.

- Expose sensitive receptors to substantial pollutant concentrations. Chapter 4 of the SCAQMD's new *Air Quality Analysis Guidance Handbook*[5]

[5] South Coast Air Quality Management District, 6 April 2002.

defines land uses considered to be sensitive receptors as long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, child care centers and athletic facilities.

$ Create objectionable odors affecting a substantial number of people.

3.2.4 Impact Analysis

Air quality impacts of a project generally fall into four major categories:

(1) *Construction* - temporary impacts, including airborne dust from grading, demolition and dirt hauling and gaseous emissions from heavy equipment, delivery and dirt hauling trucks, employee vehicles, and paints and coatings.
Construction emissions vary substantially from day to day, depending on the level of construction phase and weather conditions.

(2) *Regional Operational* - primarily gaseous emissions from natural gas and electricity usage and vehicles traveling to and from a project site.

(3) *Local Operational* - increases in pollutant concentrations, primarily carbon monoxide, resulting from traffic increases in the immediate vicinity of a project, as well as any toxic and odor emissions generated on site.

(4) *Cumulative* - air quality changes resulting from the incremental impact of the project when added to other projects in the vicinity.

The *Initial Study*[6] stated the possibility of both significant operational and construction impacts resulting from the proposed project. Therefore, the analysis of potential impacts to air quality includes both operational and construction emissions (Appendix B). Air quality impacts were analyzed utilizing guidelines and emission factors presented in the *CEQA Air Quality Handbook*[7] and current CARB motor vehicle emission factors.

Construction Impacts

Construction impacts to air quality from PM_{10} and NO_X emissions would exceed the SCAQMD threshold for significance for peak day and peak quarter, thus requiring the consideration of mitigation measures. Construction impacts to O_3, CO, SO_X, and volatile organic compounds would not be expected to exceed the SCAQMD threshold for significance for peak day or peak quarter.

Air quality impacts of a project may occur during construction on both a regional and local scale. Construction impacts include airborne dust from demolition, grading, excavation and dirt hauling and gaseous emissions from the use of heavy equipment, delivery and dirt hauling trucks, employee vehicles, and paints and coatings. These impacts may affect regional pollutants, such as O_3, or pollutants where the impacts occur very close to the source, such as PM_{10}. There are no known sources of odors on the project site that will be released during construction.

The proposed Arroyo Seco Master Plan consists of multiple projects. The schedule for implementing the projects is dependent on available funding and has not been determined at this time. The most construction would occur in the Upper Arroyo. The analysis assumes there would be several components under construction at any given time and that these components would be in the Upper and Lower Arroyo areas. Local air quality impacts would be divided between the two areas. The most potentially

[6] City of Pasadena, 2000.

[7] South Coast Air Quality Management District, 1993.

significant air quality impact would be fugitive dust, which would occur during grading and excavation activities. Representative projects that could occur together would be the construction of the west side spreading basins in the Upper Arroyo Seco section and the widening of the access road and slope stabilization in the Lower Arroyo Seco combined with restoring the historic trail and major access points from surrounding neighborhoods, also in the Lower Arroyo.

Construction impacts were assessed in accordance with procedures contained in the *CEQA Air Quality Handbook*[8] updated with current California Air Resources Board emission factors.

Demolition

The total proposed project would not include demolition of any large structures likely to contain asbestos that would be subject to the requirements of SCAQMD Rule 1403 regarding asbestos control during demolition and renovation. This rule ensures that asbestos is removed and encapsulated prior to demolition so that no asbestos fibers are released to the atmosphere. The *CEQA Air Quality Handbook*[9] states that asbestos emissions from a project are fully mitigated and not significant when the project is in compliance with Rule 1403.

There would be demolition of several small structures, including a dam gatekeeper's quarters and abandoned restrooms. However, the majority of demolition activity would be to remove asbestos roadway coatings, cement sidewalks, and old storm drains, fences, picnic tables, etc. Some of this material would be hauled away and some would be ground in place and used as fill for replacement projects in the same or nearby areas.

[8] Ibid.

[9] Ibid.

Only very minor demolition needed in conjunction with step and trail repairs would be required for the peak day and quarter projects analyzed in this report. These amounts would not be expected to be substantial; therefore, demolition would not be considered to comprise an important factor in the analysis.

Grading and Excavation

Soil would be disturbed during grading and excavation or while storing project-related equipment. Table A9-9 of the *CEQA Air Quality Handbook*[10] states that there would be 26.4 pounds of PM_{10} for each acre of graded surface.

The west-side spreading basins would total 9 acres. The analysis assumes there would be up to 1 additional acre needed for equipment storage and dirt piling. The analysis also assumes there would be up to 2 acres exposed in the Lower Arroyo Seco on the peak day and during the peak quarter.

Peak day and peak day quarter construction emissions were calculated in Table 3.2.4-1, *Maximum Daily Construction Emissions* and Table 3.2.4-2, *Peak Quarter Construction Emissions.*

[10] Ibid.

TABLE 3.2.4-1
MAXIMUM DAILY CONSTRUCTION EMISSIONS
(in pounds per day)

Source Category	Pollutant				
	Carbon Monoxide (CO)	Volatile Organic Compounds (VOC)	Oxides of Nitrogen (NOx)	Oxides of Sulfur (SOx)	Particulate Matter (PM_{10})
Earthmoving/ Grading (Fugitive Dust)					317
Dirt Piling					262
Diesel-Powered Equipment	33	20	86	8	7
Trucks	29	4	29	--	2
Employee Vehicles	7	1	1	--	--
Maximum Daily Construction Emissions	69	25	116	8	608
SCAQMD Significance Thresholds for Construction	550 lb/day	75 lb/day	100 lb/day	150 lb/day	150 lb/day
Significant?	NO	NO	YES	NO	YES
--not included in MVEI7G model					

TABLE 3.2.4-2
PEAK QUARTER CONSTRUCTION EMISSIONS
(in tons per quarter)

Source Category	Pollutant				
	Carbon Monoxide (CO)	Volatile Organic Compounds (VOC)	Oxides of Nitrogen (NOx)	Oxides of Sulfur (SOx)	Particulate Matter (PM_{10})
Earthmoving/ Grading					10.30
Dirt Piling					8.50
Diesel-Powered Equipment	1.07	0.64	2.80	0.26	0.22
Trucks	0.95	0.13	0.94	--	0.06
Employee Vehicles	0.24	0.03	0.03	--	--
Maximum Quarter Construction Emissions	2.26	0.80	3.77	0.26	19.08
SCAQMD Significance Thresholds for Construction	24.75 tons/qtr	2.5 tons/qtr	2.5 tons/qtr	6.75 tons/qtr	6.75 tons/qtr

Significant?	NO	NO	YES	NO	YES
--- not included in MVEI7G model					

Dirt Piling

The analysis assumes that on the peak day, the project would require a total of three dozers moving dirt in the Upper Arroyo and debris and dirt in the Lower Arroyo. Based on a formula contained in Table A9-9-F in the *CEQA Air Quality Handbook*,[11] each loader or dozer generates 21.8 pounds of PM_{10} an hour. The analysis assumes the dozers would operate an average of four hours a day throughout the 65-day quarter. Trucks would be required to import the 185,000 cubic yards of dirt needed for the spreading basins. Therefore, PM_{10} emissions lost in transport were assumed to be significant, thus requiring the consideration of mitigation measures. No soil export or import is assumed for the restoration projects in the Lower Arroyo that are included in the representative peak construction scenario.

Equipment

The analysis assumes there would be three dozers operating an average of four hours a day and four pieces of miscellaneous equipment operating for eight hours a day throughout the quarter. One off-road water truck would also be assumed to operate for four hours a day. Emission estimates are derived from formulas contained in Tables A9-8-A and B in *the CEQA Air Quality Handbook*.[12] Equipment emissions are shown in Table 3.2.4-1 and Table 3.2.4-2.

Trucks

[11] Ibid.

[12] Ibid.

Construction of the west-side spreading basins would require the import of 185,000 cubic yards of soil to be obtained from stream basin corridor widening. Assuming that 20-cubic yard trucks are filled to 18-cubic yard capacity to provide adequate freeboard capacity, that portion of the total project would require approximately 158 truckloads a day over a 65-day construction period. Each truck is assumed to travel 5 miles each way. In addition to the dirt trucks, there would be an average of four round trips by heavy-duty trucks a day bringing materials to the sites in the Upper and Lower Arroyo. These trucks are assumed to travel an average of 10 miles each way. Truck exhaust emissions were calculated with the CARB emission model, MVEI7G1cFB00 for summer conditions in 2003. Emissions are shown in Table 3.2.4-1 and Table 3.2.4-2.

Employee Vehicles

Different workers would be on site at different phases of construction. The analysis assumes there would be 30 workers on site during the peak construction period. Worker vehicle trips are assumed at the regional average vehicle ridership (AVR) of 1.135 and trip length of 11.2 miles each way as listed in the *CEQA Air Quality Handbook*.[13] Emission factors are from the CARB emission model, MVEI7G1cFB00 for summer conditions in 2003. Calculation sheets are contained in the Air Quality Technical Report (*Appendix B*). Daily emissions are shown in Table 3.2.4-1; peak quarter emissions in Table 3.2.4-2.

[13] Ibid.

Operational Impacts

Regional Operational

Operations at the proposed project would not exceed emission thresholds established by the SCAQMD for CO, VOC, NO_x, or PM_{10}. The project traffic report estimates that the completed project, including all three sections of the Arroyo, would generate an additional 2,956 one-way trips on weekdays and a net increase of 3,284 one-way trips on weekends.

Total annual traffic would increase because the plans for the Rose Bowl call for 25 annual events rather than the existing 16 events. However, this increase would not change peak weekday and peak weekend trips since existing events are included in the traffic report's assessment of existing conditions Table 3.2.4-3, *Net Increase in Operation Emissions*. Vehicle emissions based on total trips estimated by the traffic consultant using the California Air Resources Board model, MVEI7G1cFB00 for summer conditions in 2010.

TABLE 3.2.4-3
NET INCREASE IN OPERATION EMISSIONS
(pounds per day)

Source Category	Pollutant			
	Carbon Monoxide (CO)	Volatile Organic Compounds (VOC)	Oxides of Nitrogen (NOx)	Particulate Matter (PM_{10})
Traffic Emissions (Peak Weekday)	183	24	20	1

Traffic Emissions (Peak Weekend Day)	203	26	22	1
SCAQMD Significance Thresholds for Operation	550 lb/day	55 lb/day	55 lb/day	150 lb/day
Significant?	NO	NO	NO	NO
Traffic emissions calculated with MVEI7G 1cFB00 Utility emissions: SCAQMD CEQA Handbook 1993, Tables A9-11 A and B; Tables A9-11 A and B				

Local Operational

The project would not have a significant impact to local CO concentrations. Background levels of both the one-hour and eight-hour standards are well below state and national standards in the Pasadena area, even including days when the Rose Bowl is at peak capacity and the potential for high carbon monoxide concentrations is high. Peak CO concentrations occur in areas of heavy traffic congestion during cold weather—peak concentrations occur in December and January.

The traffic report for the Arroyo Seco Master Plan evaluated project-related and cumulative project increases in traffic at all intersections impacted by the proposed enhancements. The report found that based on City of Pasadena traffic thresholds, there was a potential for significant traffic impacts at three intersections. These traffic impacts would occur only during large Weekend Special Events, but not during any weekday or smaller Weekend Special Event. The three intersections are North Arroyo Boulevard and I-210 Freeway WB Ramps, Linda Vista Drive and Highland Drive, and Linda Vista Drive and Oak Grove Drive.

SCAQMD guidelines state that intersections performing at LOS C or better would not be subject to exceedances of the CO standard. Mitigation recommended for the two Linda Vista intersections would raise both intersections during the PM peak hour to LOS C, up from the current and projected LOS F without mitigation. The North Arroyo Boulevard/I-210 WB On/Off Ramps would be at LOS F with or without the project in 2010. The City of Pasadena requires mitigation of intersections rated LOS F where the increase in volume to capacity (V/C) is equal to or greater than 0.01. After implementation of the required mitigation, the V/C increase at the North Arroyo Boulevard/I-210 WB On/Off Ramps would be less than significant. The remaining increase would not be sufficient to increase CO levels above the SCAQMD's allowable increase.

Cumulative Impacts

The analysis of impacts to air quality from construction, regional operational, and local operational emissions was based on the traffic report that considered the proposed project and related projects. Therefore, there will be no anticipated additional cumulative impacts to air quality.

3.2.5 Mitigation Measures

The City of Pasadena Department of Public Works requires that all construction comply with SCAQMD regulations, including Rule 402, which specifies that there shall be no dust impacts off site sufficient to cause a nuisance, and SCAQMD Rule 403, which restricts visible emissions from construction.

Measure Air-1

The City of Pasadena shall require wetting of soils for all grading activities undertaken to implement the specified project components that are expected to affect areas of greater than 1 acre in size as a means of reducing PM_{10} emissions to the maximum extent practicable. Prior to advertising for construction bids for the Upper Arroyo Seco improvements, the Central Arroyo Seco improvements, or the Lower Arroyo Seco improvements, the City of Pasadena Department of Public Works shall ensure that the plans and specifications include the requirement for the construction contractor to ensure that soils are moistened prior to grading and soil moisture content is maintained at a minimum of 12 percent for all grading activities. The construction contractor shall demonstrate compliance with this measure through the submittal of monthly monitoring reports to the City of Pasadena Department of Public Works.

Measure Air-2

The City of Pasadena shall require wetting of soils for all grading activities undertaken to implement the specified project components that are expected to affect areas of greater than 1 acre in size as a means of reducing PM_{10} emissions to the maximum extent practicable. Prior to advertising for construction bids for the Upper Arroyo Seco improvements, the Central Arroyo Seco improvements, or the Lower Arroyo Seco improvements, the City of Pasadena Department of Public Works shall ensure that the plans and specifications include the requirement for the construction contractor ensure that surfaces undergoing active grading and all other exposed surfaces be watered at

least twice a day under calm conditions. Surfaces shall be watered as often as needed on days that are windy (when wind speed is less than 25 miles per hour) or during very dry weather to maintain a surface crust and prevent the release of visible emissions from the construction site. The construction contractor shall demonstrate compliance with this measure through the submittal of monthly monitoring reports to the City of Pasadena Department of Public Works.

Measure Air-3

The City of Pasadena shall require soil treatment to stabilize soils for all exposed cut or all slopes as a means for reducing PM_{10} to the maximum amount practicable. Prior to advertising for construction bids for the Upper Arroyo Seco improvements, the Central Arroyo Seco improvements, or the Lower Arroyo Seco improvements, the City of Pasadena Department of Public Works shall ensure that the plans and specifications include the requirement for the construction contractor to ensure that any area that will be exposed for extended periods will be treated with a non-toxic soil conditioner to stabilize soil or will be temporarily planted with vegetation.

Measure Air-4

The City of Pasadena shall require soil treatment to stabilize soils for all exposed cut or all slopes as a means for reducing PM_{10} to the maximum amount practicable. Prior to advertising for construction bids for the Upper Arroyo Seco improvements, the Central Arroyo Seco improvements, or the Lower Arroyo Seco improvements, the City of Pasadena Department of Public Works shall ensure that the plans and specifications include the requirement for the construction contractor to ensure that non-toxic chemical stabilizers are applied within five working days of ceasing grading or water or dust suppressants are applied in sufficient quantity to maintain a stabilized surface. The construction contractor shall demonstrate compliance with this measure through the submittal of monthly monitoring reports to the City of Pasadena Department of Public Works.

Measure Air-5

The City of Pasadena shall require construction contractors to wash equipment that will travel on public roads prior to leaving construction sites where equipment has been exposed to mud as a means of reducing PM_{10} emissions to the maximum extent possible. Prior to advertising for construction bids for the Upper Arroyo Seco improvements, the Central Arroyo Seco improvements, or the Lower Arroyo Seco improvements, the City of Pasadena Department of Public Works shall ensure that the plans and specifications include the requirement for the construction contractor to ensure that mud-covered tires and undercarriages of trucks are washed prior to leaving construction sites. The construction contractor shall demonstrate compliance with this measure through the submittal of monthly monitoring reports to the City of Pasadena Department of Public Works.

Measure Air-6

The City of Pasadena shall require construction contractors to maintain adjacent public roads free of mud and debris from the construction site on a daily basis, as a means of reducing PM_{10} emissions to the maximum extent practicable. Prior to advertising for construction bids for the Upper Arroyo Seco improvements, the Central Arroyo Seco improvements, or the Lower Arroyo Seco improvements, the City of Pasadena Department of Public Works shall ensure that the plans and specifications include the requirement for the construction contractor to provide for street sweeping, as needed, on adjacent roadways to remove dirt dropped by construction vehicles or mud that would otherwise be carried off by trucks departing project sites. The construction contractor shall demonstrate compliance with this measure through the submittal of monthly monitoring reports to the City of Pasadena Department of Public Works.

Measure Air-7

The City of Pasadena shall require that construction contractors cover all trucks hauling dirt on public roads as a means of reducing PM_{10} emissions to the maximum extent practicable. Prior to advertising for construction bids for the Upper Arroyo Seco improvements, the Central Arroyo Seco improvements, or the Lower Arroyo Seco improvements, the City of Pasadena Department of Public Works shall ensure that the plans and specifications include the requirement for the construction contractor to ensure that loads of dirt are securely covered with a tight fitting tarp on any truck leaving or entering the construction sites to bring fill dirt to the site or to dispose of excavated soil. The construction contractor shall demonstrate compliance with this measure through the submittal of monthly monitoring reports to the City of Pasadena Department of Public Works.

Measure Air-8

The City of Pasadena shall require that grading activities cease during periods when winds exceed 25 miles per hour, as a means of reducing PM_{10} emissions to the maximum extent practicable. Prior to advertising for construction bids for the Upper Arroyo Seco improvements, the Central Arroyo Seco improvements, or the Lower Arroyo Seco improvements, the City of Pasadena Department of Public Works shall ensure that the plans and specifications include the requirement for the construction contractor to ensure that grading is ceased during periods when winds exceed 25 miles per hour. The construction contractor shall demonstrate compliance with this measure through the submittal of monthly monitoring reports to the City of Pasadena Department of Public Works.

Measure Air-9

The City of Pasadena shall require that the construction contractor ensure that all cut and fill slopes are permanently protected from erosion as a means of reducing PM_{10} emissions to the maximum extent practicable. Prior to advertising for construction bids for the Upper Arroyo Seco improvements, the Central Arroyo Seco improvements, or the Lower Arroyo Seco improvements, the City of Pasadena Department of Public

Works shall ensure that the plans and specifications include the requirement for the construction contractor to provide for permanent sealing of all graded areas at the earliest practicable time after soil disturbance. The construction contractor shall demonstrate compliance with this measure through the submittal of monthly monitoring reports to the City of Pasadena Department of Public Works.

Measure Air-10

The City of Pasadena shall require the construction contractor to ensure that all construction equipment is maintained in peak working order, as a means of reducing NO_x emissions to the maximum extent practicable. Prior to advertising for construction bids for the Upper Arroyo Seco improvements, the Central Arroyo Seco improvements, or the Lower Arroyo Seco improvements, the City of Pasadena Department of Public Works shall ensure that the plans and specifications include the requirement for the construction contractor to ensure that construction equipment is maintained in peak operating condition so as to reduce operation emissions. Specifications shall require the construction contractor to certify monthly to the City of Pasadena Department of Public Works that construction equipment is being maintained in peak operating condition.

Measure Air-11

The City of Pasadena shall require of the construction contractor that all construction equipment not expected to be used for a period in excess of 15 minutes be turned off as a means of reducing NO_x emissions to the maximum extent practicable. Prior to advertising for construction bids for the Upper Arroyo Seco improvements, the Central Arroyo Seco improvements, or the Lower Arroyo Seco improvements, the City of Pasadena Department of Public Works shall ensure that the plans and specifications require the construction contractor to shut off engines when not in use.

3.2.5 Level of Significance after Mitigation

Implementation of the recommended mitigation measures would minimize the amount of pollutants emitted by construction activities to the extent feasible. Peak day and peak quarter NO_x and PM_{10} emissions would not be reduced below the SCAQMD threshold of significance through implementation to the specified mitigation measures (Table 3.2.5-1, *Maximum Daily Construction Emissions After Mitigation* and Table 3.2.5-2, *Peak Quarter Construction Emissions After Mitigation)*. After mitigation, there could still be significant emissions of both NOx and PM_{10} on the peak construction day and in the peak construction quarter. These emissions are dependent on the number and type of projects that are underway concurrently and, therefore, is considered a short-term significant impact. There will be no anticipated significant impacts to air quality from regional operational emissions or local operational emissions.

TABLE 3.2.5-1
MAXIMUM DAILY CONSTRUCTION EMISSIONS
AFTER MITIGATION
(in pounds per day)

Source Category	Pollutant				
	Carbon Monoxide (CO)	Volatile Organic Compounds (VOC)	Oxides of Nitrogen (NOx)	Oxides of Sulfur (SOx)	Particulate Matter (PM10)
Total Daily Emissions Before Mitigation	69	25	116	8	608
Grading and Excavation (50 percent reduction)					159
Dirt Piling (50 percent reduction)					131
Diesel-Powered Equipment (10 percent reduction)	3	2	9	1	1
Maximum Daily Construction Emissions after Mitigation	66	23	107	7	317
SCAQMD Significance Thresholds for Construction	550 lb/day	75 lb/day	100 lb/day	150 lb/day	150 lb/day
Significant?	NO	NO	YES	NO	YES

TABLE 3.2.5-2
PEAK QUARTER CONSTRUCTION EMISSIONS
AFTER MITIGATION
(in tons per quarter)

Source Category	Pollutant				
	Carbon Monoxide (CO)	Volatile Organic Compounds (ROC)	Oxides of Nitrogen (NOx)	Oxides of Sulfur (SOx)	Particulate Matter (PM10)
Total Peak Quarter Emissions Before Mitigation	2.26	0.80	3.77	0.26	19.08
Grading and Excavation (50 percent reduction)					5.15
Dirt Piling (50 percent reduction)					4.25
Diesel-Powered Equipment (10 percent reduction)	0.11	0.08	0.28	0.03	0.02

Peak Quarter Emissions after Mitigation	2.15	0.72	3.49	0.23	9.66
SCAQMD Significance Thresholds for Construction	24.75	2.5	2.5	6.75	6.75
Significant?	NO	NO	YES	NO	YES