APPENDIX C
AIR QUALITY ANALYSIS

4.0 AIR QUALITY

4.1 Introduction

This Section describes the air quality impacts associated with the construction and operation of the proposed Eastside Aggregate Project ("Aggregate Project"). The section begins with a brief review of applicable air quality regulations; this is followed by a description of existing environment and air quality; an estimate of air emissions is presented. The section concludes with an assessment of potential air quality impacts and a statement of compliance with applicable air quality regulations.

4.2 Applicable Air Quality Regulations

The proposed project is subject to a number of existing federal and County air quality requirements. These regulations are in addition to the Shasta County general plan. Shasta County Air Pollution Control District (SCAPCD) serves as the lead agency responsible for implementing and enforcing County air quality regulations. These regulations set specific standards of operation, define permit requirements and set emission limits. Federal, State and County air quality requirements have been incorporated into the SCAPCD regulations. The regulations are summarized Table 4-1. These regulations and requirements are in addition to those set forth under California's Environmental Quality Act (CEQA). Collectively, these regulations and requirements are aimed at protecting the environment.

4.3 Existing Environment and Air Quality

4.3.1 Existing Meteorology

The project is located in Shasta County approximately 10 miles North of the town of Burney. The project is located at 24339 Highway 89, North. The area consists of hilly and mountainous terrain. The project elevation is approximately 850 feet above sea level. Principal geographic features include Soldier Mountain to the North (elev. 5540 ft) and Chalk Mountain to the West (elev 5880 ft)

The area is characterized by warm summers and cool, wet winters. The average rainfall in Burney is approximately 28 inches. The predominant regional winds are aligned along the Northwest-Southeast axis. Annual wind speeds in the region average 7.5 miles per hour. Seasonally, the winds are strongest in the winter and weakest in summer.

4.3.2 Existing Air Quality

Under the Federal Clean Air Act (CAA) of 1970, the Environmental protection Agency (EPA) established ambient (outside) air quality standards for several air pollutants, referred to as "Criteria" air pollutants. The six criteria air pollutants are: carbon monoxide (CO), sulfur dioxide (SO_2), oxides of nitrogen (NO_2), ozone ($_{O3}$), lead (Pb) and

fine particulate matter (PM-10). The specific standards are based on medical evidence that indicates that exposure to certain air pollutants is harmful to public health. The ambient standards are two tiered: the Primary standards are designed to protect public health while the secondary standards are designed to protect the environment (e.g., damage to vegetation or property). Both primary and secondary standards are keyed to averaging periods that range from one hour to one year.

In addition to federal ambient air quality standards, California Air Resources Board (CARB) also established ambient standards. The state standards differ from the federal standards in two ways: (1) the standards are more stringent; and (2) the list of criteria pollutants was expanded to include sulfates, hydrogen sulfide (H_2S), vinyl chloride, and visibility reducing particles. As with federal standards. California standards are keyed to certain averaging periods. Table 4-2 lists the Federal and California ambient air quality standards. The main source of various criteria air pollutants and a summary of their health effects are provided in Table 4-3.

Currently, there no ambient air monitoring data available near the project site. However, CARB operated a monitoring site in Burney till March 1993. Specifically, ozone, CO and PM-10 concentrations were measured. Data reported during 1992 indicates that, with the exception of 24-hour PM-10, ambient concentrations of other pollutants were below state and federal air quality standards. The 24-hour PM-10 concentration was 86 ug/cu meter versus the state standard of 50 ug/cu meter.

4.4 Estimate of Air Emissions

The operation at the proposed project involves quarrying and production of asphaltic concrete as well as redi-mix concrete. Specific operations and their impact on dust emissions are discussed in the next subsections and are summarized below. The basic processes involve material handling, fuel combustion, drum mixing, and transportation of materials to and from the proposed plant.

OPERATION	**Emission Rates (tons/year)**			
	CO	**PM-10**	**NOx**	**SO_2**
Quarry	Negligible	0.51	Negligible	Negligible
Asphalt Plant	0.29	0.07	0.6	0.45
Concrete Plant	Negligible	0.8	Negligible	Negligible
Vehicular Movement	5.1	0.4	3.35	0.33
Elec Generator	1.12	0.37	5.2	0.34
Total	6.55	2.1	9.1	1.12

4.4.1 Emissions from Construction Phase

The proposed project would not involve any construction prior to the various operations at the site. Therefore, no construction related emissions would occur.

4.4.2 Emissions from Quarrying Operation

Quarry operations involves overburden removal and loosening of rock using bulldozers and breakers. In a few cases, explosives would be used to loosen rock and compacted soil. It is estimated that blasting would be used only six times per year. Loose rock would be transported to the processing area where it would be either stock piled or would be crushed and screened to different sizes. The proposed project would extract 30,000 cubic yards annually.

Each of these operations would generate some fugitive dust. Emission rates are based on empirical data from dust emissions from mining and crushed aggregate plants (EPA 1995). Additional measurements were conducted in 1995 by the National Stone Association (NSA 1995). On the basis of this information approximately 0.2 tons per year would be released. Detail calculations are presented in Table 4-4.

4.4.3 Emissions from Crushing and Screening Operations

Rock crushing and screening operations involve the use of jaw and cone type rock crushers. Crushed rock is screened to separate the rock into different sizes. Rock crushers and screens would be equipped with water sprays to mitigate dust. It is estimated that 0.2 tons of PM-10 would be released annually. Detailed calculations are presented in Table 4-4.

4.4.4 Emissions from Asphalt Plant

The proposed hot mix asphalt plant would produce paving material based on scientifically proportioned mixture of graded aggregate and asphalt cement. In some cases, reclaimed asphalt pavement is used in the mixture. The process of producing hot mix asphalt involves drying and heating the aggregates to prepare them for asphalt cement coating. A parallel flow type drum mix batch plant. A total of 100,000 cubic yards of hot mix asphalt would be produced annually.

Emissions from the asphalt plant occur from two mail operations: rotary drum dryer and fugitive dust emissions from material handling. These are described below.

Rotary Drum Dryer
Emissions consist of water evaporated from the aggregate, dust emissions from the aggregate and trace amounts of VOCs derived from the combustion gases. The latter include compounds regulated as hazardous air pollutants (HAPs). Emissions from this process would be controlled using fabric filters (baghouse) prior to being ducted into the

atmosphere from a stack or vent. Fabric filters control over 99% of dust and aerosol emissions. Such filters, however, do not control gaseous air pollutants.

Fugitive Dust Emissions

The operation of a hot mix asphalt batch plant would involve vehicular traffic on paved and unpaved roads, wind erosion from aggregate piles and aggregate handling. Water sprays are used to mitigate dust from these sources.

A summary of emissions from the asphalt plant were included in Section 4.4. Detailed emission calculations are presented in Table 4-5 for criteria air pollutants and in Table 4-6 for HAPs.

4.4.4 Emissions from Concrete Batch Plan

Concrete would be produced by mixing measured amounts of water, cement, sand and aggregate. The process involves storing, conveying, measuring and mixing these constituents prior to being discharged into trucks for transport to job sites. The proposed concrete batch plant would produce 8,000 cubic yards. The main air pollutant released from this operation is fugitive dust. It is estimated that 0.8 tons per year of PM-10 would be released from this operation. Detail calculations are presented in Table 4-7.

4.4.5 Emissions from Vehicular Traffic

As part of the operation, the proposed project would use trucks to transport asphalt, concrete and crushed/screened rock. The movement of trucks on-site and off-site would result in fugitive dust and gaseous emissions. In addition to truck traffic, there would be employee and miscellaneous vehicles. An estimate of daily average and maximum traffic volumes was presented earlier in Section 3.4. Annual emissions associated with vehicular traffic were summarized in Section 4.4. These emissions are based on 43 average daily trips of truck traffic and 127 trips of autos and light duty vehices as summarized in Table 3-3. Eact trip is assumed to be 15 miles one-way (30 miles round trip). Detailed emission calculations are presented in Table 4-8

4.4.5 Emissions from Electrical Power Generation

The proposed project would use a 1150 KW electric generator. The generator would be powered by a diesel engine. The choice of the generator has not be finalized, therefore, emissions were estimated for a typical 1150 KW diesel fueled generator. Emissions were summarized in Section 4.4. Detailed emission calculations are presented in Table 4-9 and are based on a 250 hp diesel engine using EPA emission factors. Actual emissions would be substantially lower as emissions from newer engines must comply with more stringent emission limits.

4.5 Estimate of Air Quality Impacts

Emission rates of various regulated air pollutants presented in Section 4-4 and an air dispersion model were used to estimate the concentration of these pollutants. Emissions were modeled as a single area source 85 acres (343,995 square meters) in size. EPA/CARB approved air dispersion model (SCREEN3) was utilized to calculate worst case concentrations of various regulated air pollutants. This methodology was chosen since local site specific meteorological data were not available. The disadvantage of this approach is that impacts are substantially (by a factor of 3 to 5) overstated. In otherwords, actual impacts would be 3 to 5 times lower than those predicted by the SCREEN3 model.

The results of the analysis are presented in Table 4-10. Since background air quality data are not available, the resulting impacts are presented in terms of percent of applicable air quality standards. The analysis shows that 24-hour PM-10 and 1-hour NO2 standards may be exceeded. As noted above actual impacts would be much lower and would not exceed either of these standards.

4.6 Estimate of Health Impacts

As noted in Section 4.4.4, the asphalt batch plant would release trace amounts of HAPs. The emission rates of HAPs is summarized in Table 4-8. The concentration of HAPs was estimated using the SCREEN3 dispersion model and the HRA96 risk model. The HRA96 risk model has been developed by CARB to estimate cancer risk from lifetime (70 years) exposure to carcinogens. The results of the HRA96 model are presented in terms of a probability of an individual contracting cancer 1000 meters (about one half mile) from the site. This distance represents the location of closest residences.

The results of the analysis shows that the maximum (70 year) cancer risk would be 0.001 cancers per million people exposed. This level of risk represents a conservative estimate of actual risk. This is because the exposure to toxic air pollutants assumed worst case meteorological conditions. A copy of the HRA96 model output is provided in the appendix.

Currently, there are no regulations defining acceptable levels of cancer risk. We note, however, that under California's Proposition 65, public notification is required only if cancers risk exceeds 10 cancers per million. In addition, CARB's Risk Management Guidelines, do not require any mitigation of toxics air pollutants if cancer risk is below 10 cancers per million.

Using these benchmarks, emissions from the proposed project would not result in a significant impact to public health.

Table 4-1
Summary of Applicable Air Quality Regulations
for Projects in Shasta County

Regulation	*Description*	*Specific Standard*
Rule 2.1	Permits required	Any new source must obtain an ATC prior to construction of the facility unless specifically exempt from the District Rules and Regulations
Rule 2.13	Title V Permits	Misc. administrative requirements for major sources
Rule 4.2	Nuisance	Discharge of any air contaminant that causes injury, annoyance, discomfort or safety is prohibited
Rule 4.4	Specific Air Contaminants	Limits of emissions of NOx, CO, SO_2, PM and Fluorine compounds
Rule 4.5	Particulate Matter	Limits on hourly PM emissions for a given process wt.
Rule 4.12	New Source Performance Standards	Subpart I limits opacity and concentration of particulate matter
Rule 4.13	National Standards or Hazardous Air Pollutants	Limits on discharge of certain hazardous air pollutants
Rule 6.1	Standards for Permits to Construct	Misc. requirements related to BACT, emission calculations and offsets.
Rule 6.2	Standards for Permits to Operate	Misc. requirements.
AB 2588	Toxic "Hot Spots" Act	Facilities emission any regulated pollutant considered a toxic air contaminant must prepare an emissions inventory and possibly a health risk assessment

Table 4-2
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard	Federal Primary	Federal Secondary
Ozone	1 Hour	0.09 ppm	0.12	0.12
Carbon Monoxide	8 Hour 1 Hour	9.0 ppm 20 ppm	9 ppm 35 ppm	-- --
Nitrogen Dioxide	Annual 1 Hour	-- 0.25 ppm	.053 ppm --	.053 --
Sulfur Dioxide	Annual 24 Hour 3 hour 1 hour	-- 0.04 ppm -- 0.25 ppm	0.03 ppm 0.14 ppm -- --	-- -- 0.5 ppm --
Fine Particulate Matter (PM-10)	Annuals 24 Hour	30 ug/cu meter 50 ug/cu meter	50 ug/cu meter 150 ug/cu meter	50 ug/cu meter 150 ug/cu meter
Sulfates	24 Hour	25 ug/cu meter	--	--
Lead	30 Day Calendar Qtr	1.5 ug/cu meter --	-- 1.5 ug/cu meter	-- 1.5 ug/cu meter
Hydrogen Sulfide	1 Hour	0.03	--	--
Vinyl Chloride	24 Hour	0.01 ppm	--	--
Visibility reducing Particles	8 Hour (10 am to 6 pm PST)	See Note (f)	--	--

Notes

(a) National standards, except ozone and those based on annual averages, are not to be exceeded more than once per year. The ozone standard is attained when the number of days per calendar year with max. ozone concentration is less than or equal to 1.
(b) California standards are not to be exceeded for any air pollutant except sulfates, lead, hydrogen sulfide, and vinyl chloride. The latter are not to be equaled or exceeded.
(c) National primary standards are designed, with an adequate margin of safety, to protect the public health.
(d) The National secondary standards are designed to to protect public welfare from any anticipated or known adverse health effect.
(e) Annual geometric man concentration is used in California; annual arithmetic mean is used in federal standards.
(f) In sufficient amount to produce an extinction coefficient of 0.23 per km due to particles when relative humidity is less than 70%.

ppm – parts per million by volume
ug/cu meter – micrograms per cubic meter

Source: California Air resources Board, California Air Quality Data, Annual Summary, 1996.

Table 4-3
Sources and Health Effects of Commonly Occurring Criteria Air Pollutants

Pollutant	Source	Primary Health Effects
Ozone	Secondary pollutant formed in the atmosphere from reactions involving organic compounds and NOx	• Worsening of respiratory and cardiovascular decreases • Eye irritation • Impairment of cardiopulmonary function
Carbon Monoxide	• Incomplete combustion of fuel • Natural events, such as decomposition of organic matter	• Reduced tolerance for exercise • Impairment of mental function and fetal development • Death at high levels of exposure • Aggravation of certain heart diseases
Nitrogen Dioxide	• Motor vehicle exhaust • High temperature combustion sources • Atmospheric reactions	• Aggravation of respiratory illness • Reduced visibility • Reduced plant growth • Formation of acid rain
Sulfur Dioxide	• Combustion of sulfur containing fuels • Smelting of sulfur containing metal ores • Industrial processes	• Aggravation of respiratory diseases • Reduced lung function • Reduced visibility • Eye irritation • Plant injury • Deterioration of metals, textiles, leather, finishes and coatings, etc.
PM-10	• Combustion of solid fuels • Construction activities • Industrial processes • Atmospheric chemical reactions	• Reduced lung function • Aggravation of the effects of gaseous pollutants • Aggravation of respiratory and cardiovascular diseases • Increased cough and chest discomfort • Soiling • Reduced Visibility
Lead	Contaminated soil	• Impairment of blood function and nerve constriction • Behavioral and hearing problems in children

Table 4-4
Estimate of Air Emissions From Quarry Operations
(Emissions Based on 30,000 Cubic Yards per Year)

Operation	Emission Factor *(lb/ton)*		-----**PM-10 Emissions**----- *(lb/hr)*	*(lb/day)*	*(lbs/yr)*
Excavation	0.0007		0.04375	0.350	42
Blasting	0.015		0.9375	7.50	900
Loading/Material Handling	0.0014		0.0875	0.70	84
		Totals	**1.07**	**8.55**	**1026**

Notes:

1. Annual Throughput (yd^3/yr): 30000 cubic yds/yr
2. Emission factors from AP-42 Tables 11.1-5, 11.1-8 and Section 13.2-4 (EPA 1995)

Table 4-5
Estimate of Air Emissions From Rock Crushing and Screening Operations
(Emissions Based on 30,000 Cubic Yards per Year)

Operation	Emission Factor *(lb/ton)*		-----**PM-10 Emissions**------ *(lb/hr)*	*(lb/day)*	*(lbs/yr)*
Rock Crushing	0.0017		0.1063	0.850	102
Screening	0.0071		0.4438	3.550	426
Loading/Material Handling	0.0014		0.0875	0.700	84
		Totals	**0.638**	**5.1**	**612**

Notes:
1. Annual Throughput (yd3/yr): 30000 cubic yds/yr
2. Emission factors from AP-42 Tables 11.1-5, 11.1-8 and Section 13.2-4 (EPA 1995)

Table 4-6
Estimate of Air Emissions From Drum Type Asphalt Batch Plant
(Based on 10,000 Cubic Yards per Year)

Pollutant	*Emission Factor (lb/ton)*	--------**Emissions**--------- *(lb/hr)*	*(lb/day)*	*(lbs/yr)*
PM-10	0.0082	0.137	1.09	131.2
CO	0.036	0.6	4.80	576
NOx	0.075	1.25	10.00	1200
SO_2	0.056	0.933	7.47	896
TOC	0.069	1.15	9.20	1104

Notes:

1. Plant throughput (yd^3/yr): 10000
2. Emission factors from AP-42 Tables 11.1-5, 11.1-8 and Section 13.2-4 (EPA 1995)

Table 4-7
Shasta Valley Asphalt and Aggregate Project
Estimate of Toxic Air Emissions

	Pollutant	*Emission Factor (lb/ton)*	*Annual Emissions (lb/yr)*	*(gram/sec)*
Organics	Acetaldehyde	0.0013	26	8.24455E-07
	Acetone	0.00083	16.6	5.26383E-07
	Acrolein	2.60E-05	0.52	1.64891E-08
	Benzene	0.0012	24	7.61035E-07
	Formaldehyde	2.40E-03	48	1.52207E-06
	Benzo(a)pyrene	9.20E-09	1.84E-04	5.8346E-12
	Napthalene	3.10E-04	6.2	1.96601E-07
	Toluene	7.50E-04	15	4.75647E-07
	Xylene	1.60E-04	3.2	1.01471E-07
Metals	Arsenic	1.10E-06	2.20E-02	6.97615E-10
	Cadmium	4.40E-07	8.80E-03	2.79046E-10
	Chrome+6	1.20E-06	2.40E-02	7.61035E-10
	Copper	6.10E-06	1.22E-01	3.86859E-09
	Lead	3.30E-06	6.60E-02	2.09285E-09
	Mercury	7.30E-09	1.46E-04	4.62963E-12
	Nickel	1.50E-05	3.00E-01	9.51294E-09
	Phosphorus	5.50E-05	1.10E+00	3.48808E-08
	Zinc	4.20E-05	8.40E-01	2.66362E-08

Notes:
1. Emission factors from Table 11.1-10, AP-42 1/95.
2. Annual throughput: 10000 cubic yards/yr

Table 4-9
Estimate of Air Emissions From Vehicular Traffic

	Pollutant	*Emission Factor (gram/mile)*	--------Emissions--------- *(lb/hr)*	*(lb/day)*	*(ton/yr)*
Trucks					
	PM-10	2.28	0.81	6.5	0.39
	CO	7.96	2.83	22.6	1.36
	NOx	16.44	5.84	46.7	2.80
	SO_2	1.90	0.675	5.40	0.324
	TOC	2.21	0.78	6.3	0.38
Autos					
	PM-10	0.01	0.010	0.08	0.005
	CO	7.52	7.89	63.11	3.79
	NOx	1.09	1.143	9.15	0.549
	SO_2	0.008	0.008	0.07	0.004
	TOC	0.38	0.399	3.19	0.191

Notes.
Emission Factors from EMFAC7 - Based on 40 mph, summertime factors.

Trucks Includes traffic for concrete batch plant, asphalt plant and other industrial activities. Based on 43 trips/day 30 miles/trip for 120 days/year
Total truck mileage: 1290 miles/day Ref. Table 3-3.

Autos/Light Trucks
Includes commercial light-duty trucks, employee and misc. vehicles.
Based on 127 trips/day, 30 miles roundtrip, 120 days/year
Daily Mileage: 3810 miles/day Ref. Table 3-3.

Table 4-10
Estimate of Air Emissions From a 1150 KW Electric Generator

Pollutant	*Emission Factor* *(lb/hp-hr)*	**----------Emissions----------** *(lb/hr)*	*(lb/day)*	*(lbs/yr)*
PM-10	2.20E-03	0.77	6.16	739.2
CO	6.68E-03	2.34	18.7	2244
NOx	0.031	10.85	86.8	10416
SO_2	2.05E-03	0.72	5.74	689
TOC	2.47E-03	0.86	6.92	830

Notes:
1. Diesel Engine Hosepower: 350
2. Emission factors from AP-42 Table 3.3-2 (EPA 1995)

Table 4-11
Estimate of Air Quality Impacts

Pollutant	Averaging Time	Project Impact *(ug/cu meter)*	Percent of Standard *(ug/cu meter)*	Air Quality Standard *(ug/cu meter)*
PM-10	*24-hr*	102	Note 1	50
	Annual	25	83	30
CO	*1-hr*	174	0.7	23,000
	8-hr	122	1.2	10,000
NOx	*1 hr*	719	Note 1	470
	Annual	72	72	100
SO2	*1-hr*	67	10	655
	3-hr	60	0.4	1,300
	24-hr	27	25	105
	Annual	6.7	8.4	80

Notes.

1. Screening level modeling indicates that this standard would be violated. since worst case meteorological data were used. Use of on-site data would show a substantial reduction in potential impacts.

Shasta County AQMD should be contacted to determine appropriate offsets. If the project emissions still exceed the above threshold with emission offsets credited, an Environmental Impact Report (EIR) should be prepared, focusing on air quality, traffic impacts, and project alternatives.

f. If air quality impacts are not significant, then a Negative Declaration may be appropriate if other impacts do not exist.

D. Recommended Standard Mitigation Measures (SMM) Applicable to All Projects

1. Provide energy-efficient process systems, such as water heaters, furnaces, and boiler units.

2. Apply nontoxic soil stabilizers according to manufacturer's specification to all inactive construction areas (previously graded areas inactive for ten days or more).

3. Reestablish ground cover on the construction site through seeding and watering prior to final occupancy.

4. All grading operations of a project shall be suspended when winds (as instantaneous gusts) exceed 20 miles per hour as directed by the AQMD.

5. All new wood burning devices shall be EPA Phase II certified.

6. Streets should be designed to maximize pedestrian access to transit stops.

7. Large residential, commercial, and industrial projects should include bus shelters at transit access points.

8. Provide temporary traffic control as appropriate during all phases of construction to improve traffic flow (e.g. flag person).

9. Schedule construction activities that affect traffic flow to off-peak hours.

10. Water active construction sites at least twice daily as directed by the Public Works Department.

11. All trucks hauling dirt, sand, soil, or other loose materials should be covered or should maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the trailer) in accordance with the requirements of CVC Section 23114. This provision is enforced by local law enforcement agencies.

12. Sweep streets at the end of the day if visible soil materials are carried onto adjacent public paved roads (recommend water sweeper with reclaimed water).

13. Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip.

Note: Additional mitigations may be obtained from the CEQA Air Quality Handbook prepared by the South Coast Air Quality Management District, Diamond Bar, California (April 1993). Copies are available for review in the Redding Department of Planning and Community Development.

E. Residential Projects: Recommended Best Available Mitigation Measures (BAMM)

Level "A" Measures

1. Implement all applicable Standard Mitigation Measures.

2. Contribute to traffic-flow improvements that reduce emissions and are not growth-inducing (e.g., right-of-way, capital improvements, etc.).

3. Install an electrical outlet at the front and back of all residential units for electrical yard equipment.

Level "B" Measures

1. Implement all applicable Standard Mitigation Measures and Level "A" Mitigation Measures.

2. Construct, contribute, or dedicate land for the provision of off-site bicycle trails linking the facility to designated bicycle commuting routes in accordance with an adopted citywide or countywide plan.

3. Synchronize traffic signals along streets impacted by development.

4. Construct on-site and off-site bus turnouts, passenger benches, and shelters.

5. Provide for pedestrian access between bus service and major points within the development.

6. Construct off-site pedestrian facility improvements such as overpasses and wider sidewalks.

7. Include neighborhood retail sales and services within or adjacent to residential subdivisions. (Note, this provision cannot be applied until the City's Land Use Element has been revised to allow mixed use.)

8. Orient building structures and install landscape that takes advantage of passive solar design principles.

9. Install solar water heaters for at least 25 percent of the residential units in the development.

10. Incorporate mixed use development in order to achieve a balance of commercial, employment, and housing options within the project site. (Note, this provision cannot be applied until the City's Land Use Element has been revised to allow mixed use.)
11. Provide neighborhood park(s) or other recreational options, such as trails, within development to minimize vehicle travel to other parks or commercial areas.

12. Provide densities of six units or greater to support transit.

F. Commercial/Industrial Projects: Recommended Best Available Mitigation Measures (BAMM)

Level "A" Measures

1. Implement all applicable Standard Mitigation Measures.

2. Contribute to traffic-flow improvements that are not growth-inducing (e.g., right-of-way, capital improvements, etc.).

3. Provide preferential parking spaces for carpools and vanpools and provide 7-foot 2-inch minimum vertical clearance in parking facilities for vanpool access.

Level "B" Measures

1. Implement all applicable Standard Mitigation Measures and Level "A" Mitigation Measures.

2. Established as appropriate, telecommuting programs, alternate work schedules, and guaranteed ride home programs.

3. Provide for transit-use incentives such as subsidized transit passes and accommodation of unusual work schedules to encourage transit use.

4. Convert fleet vehicles to clean-burning fuel as appropriate.

5. Provide when appropriate, shower/locker facilities for bicycling and pedestrian commuters.

6. Construct off-site bicycle and pedestrian facility improvements, such as trails, linking the facility to designated pedestrian/bicycle commuting routes.

7. Provide on-site services, such as cafeterias, food vending machines, automatic tellers, etc., as appropriate.

8. Contribute to construction of off-site park-n-ride lots.

9. Provide on-site child care and after-school facilities or contribute to off-site development within walking distance.

10. Construct on-site pedestrian facility improvements, such as walk paths and building access, which are physically separated from street and parking lot traffic.

11. Implement compressed work-week schedules where weekly work hours are compressed into fewer than five days, such as 9/80, 4/40 or 3/36.

12. Construct on-site and off-site bus turnouts, passenger benches, or shelters.

13. Provide adequate bicycle storage/parking facilities.

14. Implement alternative transportation program such as Caltrans Rideshare.

TABLE 7

RESIDENTIAL PROJECTS
Sample Mitigation Measure Efficiencies for Controlling
Indirect Mobile Source Emissions

Mitigation Measures	Emission Reduction Efficiency		
	ROG	NO_x	PM_{10}
< Construct on-site or off-site bus turnouts, passenger benches, and shelters	0.2-1.9%	0.2-2.5%	0.2-2.5%
< Construct off-site pedestrian facility improvements such as overpasses and wider sidewalks	0.1-0.3%	0.1-0.4%	0.1-0.4%
< Contribute to regional transit system improvements (e.g., right-of-way, capital improvements, etc.)	4.0-8.0%	4.0-8.0%	4.0-8.0%
< Synchronize traffic lights on existing streets impacted by development	4.0-8.0%	4.0-8.0%	4.0-8.0%
< Construct, contribute, or dedicate land for the provision of off-site bicycle trails linking the facility to designated bicycle commuting routes	0.1-0.6%	0.1-0.8%	0.1-0.8%
< Include retail services within or adjacent to residential subdivisions	1.0-4.0%	1.3-6.0%	1.3-6.0%
< Provide for pedestrian access between bus service and major points within the development (e.g.,sidewalks, paths, walkways)	0.1-3.0%	0.1-3.0%	0.1-3.0%
< Orient buildings for passive solar design	1.0-2.0%	1.0-3.0%	1.0-5.5%
< Include neighborhood telecommunication or telework center within residential subdivision	1.0-5.0%	1.0-5.0%	1.0-5.0%
< Include residential development within commercial core area or business district	4.0-13.0%	4.0-13.0%	4.0-13.0%

NOTE: The Anderson Planning Department, in consultation with AQMD, will determine the degree of efficiency for the mitigations of this table, but generally, the average of the range shall be used.