AIR QUALITY IMPACT ANALYSIS FOR THE PROPOSED HEMET-RYAN AIRPORT MASTER PLAN

Prepared for:
Mead & Hunt
707 Aviation Blvd.
Santa Rosa, CA. 95401

March 2004

EXISTING CONDITIONS

Air Pollution Climatology

The project is located within the eastern portions of the South Coast Air Basin (SCAB) and is within the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAB is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. It includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties.

The topography and climate of Southern California combine to make the Basin an area of high air pollution potential. During the summer months, a warm air mass frequently descends over the cool, moist marine layer produced by the interaction between the ocean's surface and the lowest layer of the atmosphere. The warm upper layer forms a cap over the cool marine layer and inhibits the pollutants in the marine layer from dispersing upward. In addition, light winds during the summer further limit ventilation abundant sunshine triggers the photochemical reactions that produce ozone.

Ambient Air Quality Standards

Both the U. S. Environmental Protection Agency and the California Air Resources Board have established ambient air quality standards for common pollutants. These ambient air quality standards are levels of contaminants which represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. Table 1 identifies the major criteria pollutants, characteristics, health effects and typical sources.

The federal and California state ambient air quality standards are summarized in Table 2 for important pollutants.

The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and particulate matter (PM_{10} and $PM_{2.5}$).

The U.S. Environmental Protection Agency established new national air quality standards for ground-level ozone and for fine particulate matter in 1997. The existing 1-hour ozone standard of 0.12 PPM microns or less) is to be phased out and replaced by an 8-hour standard of 0.08 PPM. Implementation of the 8-hour standard was delayed by litigation, but was determined to be valid and enforceable by the U. S. Supreme Court in a decision issued in February of 2001.

Table 1: Major Criteria Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
Ozone	A highly reactive photochemical pollutant created by the action of sunshine on ozone precursors (primarily reactive hydrocarbons and oxides of nitrogen. Often called photochemical smog.	●Eye Irritation ●Respiratory function impairment.	The major sources ozone precursors are combustion sources such as factories and automobiles, and evaporation of solvents and fuels.
Carbon Monoxide	Carbon monoxide is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels.	●Impairment of oxygen transport in the bloodstream. ●Aggravation of cardiovascular disease. ●Fatigue, headache, confusion, dizziness. ●Can be fatal in the case of very high concentrations.	Automobile exhaust, combustion of fuels, combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide	Reddish-brown gas that discolors the air, formed during combustion.	●Increased risk of acute and chronic respiratory disease.	Automobile and diesel truck exhaust, industrial processes, fossil-fueled power plants.
Sulfur Dioxide	Sulfur dioxide is a colorless gas with a pungent, irritating odor.	●Aggravation of chronic obstruction lung disease. ●Increased risk of acute and chronic respiratory disease.	Diesel vehicle exhaust, oil-powered power plants, industrial processes.
Particulate Matter	Solid and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for a long period of time.	●Aggravation of chronic disease and heart/lung disease symptoms.	Combustion, automobiles, field burning, factories and unpaved roads. Also a result of photochemical processes.

Table 2: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour 8-Hour	0.12 PPM 0.08 PPM	0.09 PPM --
Carbon Monoxide	8-Hour 1-Hour	9.0 PPM 35.0 PPM	9.0 PPM 20.0 PPM
Nitrogen Dioxide	Annual Average 1-Hour	0.05 PPM --	-- 0.25 PPM
Sulfur Dioxide	Annual Average 24-Hour 1-Hour	0.03 PPM 0.14 PPM --	-- 0.05 PPM 0.25 PPM
PM_{10}	Annual Average 24-Hour	50 $\mu g/m^3$ 150 $\mu g/m^3$	20 $\mu g/m^3$ 50 $\mu g/m^3$
$PM_{2.5}$	Annual 24-Hour	15 $\mu g/m^3$ 65 $\mu g/m^3$	12 $\mu g/m^3$ --

PPM = Parts per Million
$\mu g/m^3$ = Micrograms per Cubic Meter

Suspended particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. "Inhalable" PM consists of particles less than 10 microns in diameter, and is defined as "suspended particulate matter" or PM_{10}. Fine particles are less than 2.5 microns in diameter ($PM_{2.5}$). $PM_{2.5}$, by definition, is included in PM_{10}.

In 1997 new national standards for fine Particulate Matter (diameter 2.5 microns or less) were adopted for 24-hour and annual averaging periods. The current PM_{10} standards were to be retained, but the method and form for determining compliance with the standards were revised.

The State of California regularly reviews scientific literature regarding the health effects and exposure to PM and other pollutants. On May 3, 2002, the California Air Resources Board (CARB) staff recommended lowering the level of the annual standard for PM_{10} and establishing a new annual standard for $PM_{2.5}$ (particulate matter 2.5 micrometers in diameter and smaller). The new standards became effective on July 5, 2003.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important, in terms of health risk, are diesel particulate, benzene, formaldehyde, 1,3-butadiene and acetaldehyde.

Public exposure to TACs can result from emissions from normal operations, as well as accidental releases. Health effects of TACs include cancer, birth defects, neurological damage and death.

Current Air Quality

The South Coast Air Quality Management District monitors air quality at numerous locations within the air basin, although none are located in Hemet. The closest monitoring site to the project site are located in Perris, northwest of the project area, and in Lake Elsinore, southwest of the project area. Table 3 shows that the federal/state standards for ozone and PM_{10} are frequently exceeded in the project vicinity.

Table 3: Summary of Air Quality Data for Perris and Lake Elsinore

Pollutant/ Standard	Monitoring Site	Days Exceeding Standard in:		
		2001	2002	2003
Ozone Federal 1-Hour	Perris Lake Elsinore	19 12	4 6	7 7
Ozone State 1-Hour	Perris Lake Elsinore	73 62	59 52	67 50
Ozone Federal 8-Hour	Perris Lake Elsinore	56 46	39 41	46 36
Carbon Monoxide State/Federal 8-Hr	Lake Elsinore	0	0	0
Nitrogen Dioxide/ State 1-Hour	Lake Elsinore	0	0	0
PM_{10} Federal 24-Hour	Perris	0	0	0
PM_{10} State 24-Hour	Perris	16	24	18

Source: California Air Resources Board, Aerometric Data Analysis and Management System (ADAM), 2004.

Attainment Status and Regional Air Quality Plans

Federal and state air quality laws require identification of areas not meeting the ambient air quality standards. These areas must develop regional air quality plans to eventually attain the standards. Under both the federal and state Clean Air Acts, the South Coast Air Basin is a nonattainment area (standards have not been attained) for ozone and PM_{10}. The air basin is either attainment or unclassified for other ambient standards.

The current regional air quality plan is the 2003 Air Quality Management Plan (AQMP) adopted by the South Coast Air Quality Management District on August 1, 2003. The 2003 AQMP updates the attainment demonstration for the standards for ozone and PM_{10}, replaces the 1997 attainment demonstration for the federal carbon monoxide (CO) standard, provides a basis for a maintenance plan for CO for the future, and updates the maintenance plan for the federal nitrogen dioxide (NO_2) standard that the South Coast Air Basin (Basin) has met since 1992.

Significance Criteria

The South Coast Air Quality Management District has established the following significance thresholds for project operations:[1]

- 55 pounds per day of Reactive Organic Compounds (ROC)
- 55 pounds per day of Nitrogen Oxides (NOx)
- 550 pounds per day of Carbon Monoxide (CO)
- 150 pounds per day of PM_{10}
- 150 pounds per day of Sulfur Oxides (SOx)

The District has also identified additional indicators to be used as screening criteria indicating the need for further analysis with respect to air quality as follows:

- Project could interfere with the attainment of the federal or state ambient air quality standards by either violating or contributing to an existing or projected air quality violation.
- Project could result in population increases within the regional statistical area which would be in excess of that projected in the AOMP and in other than planned locations for the project's build-out year.
- Project could generate vehicle trips that cause a CO hot spot.
- Project will have the potential to create or be subjected to an objectionable odor over 10 dilution to thresholds (D/T) that could impact sensitive receptors.
- Project will have hazardous materials on site and could result in an accidental release of air toxic emissions or acutely hazardous materials posing a threat to

[1] South Coast Air Quality Management District, CEQA Air Quality Handbook, 1993.

public health and safety.

- Project could emit an air toxic contaminant regulated by District rules or that is on a federal or state air toxic list.
- Project could involve burning of hazardous, medical, or municipal waste as waste-to-energy facilities.
- Project could be occupied by sensitive receptors within a quarter mile of an existing facility that emits air toxics identified in District Rule 1401 (New Source Review of carcinogenic air contaminants) or near CO hot spots.
- Project could emit carcinogenic or toxic air contaminants that individually or cumulatively exceed the maximum individual cancer risk of 10 in 1 million.

CHECKLIST DISCUSSION

Would the proposal:

a) Conflict with or obstruct implementation of the applicable air quality plan?

No Impact. The South Coast Air Basin is currently a federal and state nonattainment area for PM_{10} and ozone. The current regional air quality plan is the 2003 Air Quality Management Plan (AQMP). The proposed project would not conflict with or obstruct implementation of any of the control measures in these air quality plans.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less than Significant Impact. Development projects are most likely to violate and air quality standard or contribution substantially to an existing or projected air quality violation through generation of vehicle trips. New vehicle trips add to carbon monoxide concentrations near streets providing access to the site.

Peak hour vehicle trip generation associated with the proposed Master Plan would be 21 trips in the PM peak traffic hour. While this small trip generation would add to traffic volumes and resulting CO concentrations, it is unlikely to result in any new violations of the 8-hour standards for carbon monoxide, nor contribute substantially to an existing or projected violation. The region is in attainment for this pollutant and the project site is located in an area with low background concentrations for this pollutant.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Less than Significant Impact. In the future, the emissions associated with aircraft operations would change at the Hemet-Ryan Airport. The number of daily operations would be increasing in the future, and the types of aircraft being used would also change. The FAA-approved *Emissions and Dispersion Modeling System* (Version 4.0)[2] was applied to current operations at the airport and future operations in the year 2022 to determine changes in emissions from aircraft over that time period. For each aircraft type, a prototypical aircraft model was assumed. Table 4 shows daily additional nonattainment emissions associated with anticipated growth in aircraft operations. The EDMS program output is included in an appendix.

[2] CSSI, Inc., *Emissions and Dispersion Modeling System (EDMS) Reference Manual*, May 2001.

Table 4
Project-Related Aircraft and Automobile Emissions, in Pounds Per Day

	ROC	**NOx**	**PM_{10}**
New Aircraft Emissions	25.7	39.7	0.2
Automobile Emissions	6.4	6.4	0.3
Total Emissions	32.1	46.7	0.5
SCAQMD Threshold	55.0	55.0	150.0

The proposed project would result in new vehicle trips attracted to the airport. The incremental increase in daily vehicle trips associated with buildout of the Master Plan is estimated at 136. Indirect emissions associated with new vehicle trips generated by the project uses were calculated using the EMFAC2002 emission factors and an average trip length of 15 miles. New daily indirect emissions from new auto trips are also shown in Table 4 and total emissions are compared to the SCAMQD thresholds of significance.

The emission changes shown in Table 4 would not exceed the South Coast Air Quality Management District's thresholds of significance. Project impacts on non-attainment pollutants would be less than significant.

d) Expose sensitive receptors to substantial pollutant concentrations?

Potentially Significant Impact Unless Mitigation Incorporated. Implementation of the proposed Master Plan would result in construction-related emissions at various times. During construction activities such as clearing, excavation and grading operations, construction vehicle traffic and wind blowing over exposed earth would generate fugitive particulate matter emissions that would temporarily affect local air quality. The dry, windy climate of the area during the summer months creates a high potential for dust generation when and if underlying soils are exposed to the atmosphere.

The effects of construction activities would be increased dustfall and locally elevated levels of PM_{10} downwind of construction activity. Construction dust has the potential for creating a nuisance at nearby properties. This impact is considered potentially significant.

Mitigation: Require implementation of emission control measures by construction contractors during all construction phases. All construction contracts shall require that dust control practices and other construction control measures as identified in SCAQMD rules, regulations and CEQA Guidelines in effect at the time of the contract be implemented throughout all stages of construction.

e) Create objectionable odors affecting a substantial number or people?

Less than Significant Impact. During construction the various diesel-powered vehicles and equipment in use on the site would create odors. These odors are temporary and not likely to be noticeable beyond the project boundaries.

Airport operations could result in intermittent odors affecting a small area, but would not affect a substantial number of people.

APPENDIX: EDMS MODEL OUTPUT

EDMS 4.0 Emissions Inventory Report

Study Name: hemet2002

Airport: Hemet-Ryan

Report Date: 03/17/04

SUMMARY

(Tons/Year)

NAME	CO	HC	NOx	SOx	PM10
Aircraft	301.222	13.681	14.220	1.092	.000
GSE/AGE/APU	255.224	4.867	10.599	.451	.274
Total	556.446	18.548	24.819	1.543	.274

AIRCRAFT EMISSIONS

(Tons/Year)

Aircraft	Engine	Mode	CO	HC	NOx	SOx	PM10
560 Citation V	JT15D-5 (A & B)	TAXI	1.666	1.665	.023	.008	000
560 Citation V	JT15D-5 (A & B)	TKOF	.000	.000	4.267	.207	000
560 Citation V	JT15D-5 (A & B)	CLMB	.438	.495	3.836	.206	000
560 Citation V	JT15D-5 (A & B)	APCH	25.723	7.797	3.285	.360	.000
560 Citation V	JT15D-5 (A & B)	APU	.000	.000	.000	.000	000
560 Citation V	JT15D-5 (A & B)	GSE	254.949	4.807	9.627	392	251
AH-1	T400-CP-400	TAXI	.000	.000	.000	000	000
AH-1	T400-CP-400	TKOF	.000	.000	.000	000	000
AH-1	T400-CP-400	CLMB	.085	.006	.157	.017	.000
AH-1	T400-CP-400	APCH	.498	.140	.050	009	.000
AH-1	T400-CP-400	APU	.000	.000	.000	.000	000
AH-1	T400-CP-400	GSE	.000	.000	.000	.000	000
Aztec	TIO-540-J2B2	TAXI	.079	.004	.000	.000	.000
Aztec	TIO-540-J2B2	TKOF	2.776	.024	.001	.000	.000
Aztec	TIO-540-J2B2	CLMB	4.468	.051	.001	.000	.000
Aztec	TIO-540-J2B2	APCH	5.403	.000	.006	.000	.000
Aztec	TIO-540-J2B2	APU	.000	.000	.000	000	.000
Aztec	TIO-540-J2B2	GSE	.000	.000	.000	.000	000
Cherokee six	TIO-540-J2B2	TAXI	.049	.003	.000	000	000
Cherokee six	TIO-540-J2B2	TKOF	6.425	.055	.002	000	000
Cherokee six	TIO-540-J2B2	CLMB	9.387	.106	.002	.001	.000
Cherokee six	TIO-540-J2B2	APCH	16.876	.000	.019	.001	.000
Cherokee six	TIO-540-J2B2	APU	.000	.000	.000	000	.000
Cherokee six	TIO-540-J2B2	GSE	.000	.000	.000	.000	.000
Piper PA-28	IO-320-DIAD	TAXI	.223	.013	.000	.000	000
Piper PA-28	IO-320-DIAD	TKOF	12.244	.727	.116	034	.000
Piper PA-28	IO-320-DIAD	CLMB	83.125	.896	.524	.051	000
Piper PA-28	IO-320-DIAD	APCH	131.377	1.699	.473	.075	000
Piper PA-28	IO-320-DIAD	APU	.000	.000	.000	.000	000
Piper PA-28	IO-320-DIAD	GSE	.000	.000	.000	.000	000
SA-227 AC Metro3	PW125-B	TAXI	.005	.000	.004	.001	.000

SA-227 AC Metro3	PW125-B	TKOF	.031	.000	.271	.015	.000
SA-227 AC Metro3	PW125-B	CLMB	.041	.000	.316	.020	000
SA-227 AC Metro3	PW125-B	APCH	.303	.000	.867	.087	000
SA-227 AC Metro3	PW125-B	APU	.098	.007	.484	.048	.000
SA-227 AC Metro3	PW125-B	GSE	.177	.053	.488	.011	.023

** Denotes User Created Aircraft

EDMS 4.0 Emissions Inventory Report

Study Name: hemet2022

Airport: Hemet

Report Date: 03/17/04

SUMMARY

(Tons/Year)

NAME	CO	HC	NOx	SOx	PM10
Aircraft	512.264	17.517	19.109	1.508	.000
GSE/AGE/APU	300.339	5.719	12.959	.591	.315
Total	812.603	23.236	32.068	2.099	.315

AIRCRAFT EMISSIONS

(Tons/Year)

Aircraft	Engine	Mode	CO	HC	NOx	SOx	PM10
560 Citation V	JT15D-5 (A & B)	TAXI	1.960	1.959	.027	.009	.000
560 Citation V	JT15D-5 (A & B)	TKOF	.000	.000	5.020	.244	.000
560 Citation V	JT15D-5 (A & B)	CLMB	.515	.582	4.513	.242	.000
560 Citation V	JT15D-5 (A & B)	APCH	30.262	9.173	3.865	.423	.000
560 Citation V	JT15D-5 (A & B)	APU	.000	.000	.000	.000	.000
560 Citation V	JT15D-5 (A & B)	GSE	299.940	5.655	11.326	.461	.296
AH-1	T400-CP-400	TAXI	.000	.000	.000	.000	.000
AH-1	T400-CP-400	TKOF	.000	.000	.000	.000	.000
AH-1	T400-CP-400	CLMB	.169	.012	.314	.035	.000
AH-1	T400-CP-400	APCH	.995	.280	.100	.018	.000
AH-1	T400-CP-400	APU	.000	.000	.000	.000	.000
AH-1	T400-CP-400	GSE	.000	.000	.000	.000	.000
Aztec	TIO-540-J2B2	TAXI	.635	.033	.000	.000	.000
Aztec	TIO-540-J2B2	TKOF	22.207	.190	.006	.002	.000
Aztec	TIO-540-J2B2	CLMB	35.741	.404	.006	.003	.000
Aztec	TIO-540-J2B2	APCH	43.222	.000	.048	.004	.000
Aztec	TIO-540-J2B2	APU	.000	.000	.000	.000	.000
Aztec	TIO-540-J2B2	GSE	.000	.000	.000	.000	.000
Cherokee six	TIO-540-J2B2	TAXI	.099	.005	.000	.000	.000
Cherokee six	TIO-540-J2B2	TKOF	12.850	.110	.003	.001	.000
Cherokee six	TIO-540-J2B2	CLMB	18.774	.212	.003	.001	.000
Cherokee six	TIO-540-J2B2	APCH	33.752	.000	.037	.003	.000
Cherokee six	TIO-540-J2B2	APU	.000	.000	.000	.000	.000
Cherokee six	TIO-540-J2B2	GSE	.000	.000	.000	.000	.000
Piper PA-28	IO-320-DIAD	TAXI	.304	.018	.001	.000	.000
Piper PA-28	IO-320-DIAD	TKOF	16.730	.994	.158	.047	.000
Piper PA-28	IO-320-DIAD	CLMB	113.581	1.224	.716	.069	.000
Piper PA-28	IO-320-DIAD	APCH	179.514	2.321	.646	.103	.000
Piper PA-28	IO-320-DIAD	APU	.000	.000	.000	.000	.000
Piper PA-28	IO-320-DIAD	GSE	.000	.000	.000	.000	.000
SA-227 AC Metro3	PW125-B	TAXI	.014	.000	.010	.001	.000

EDMS 4.0 Emissions Inventory

SA-227 AC Metro3	PW125-B	TKOF	.079	.000	.678	.037	000
SA-227 AC Metro3	PW125-B	CLMB	.103	.000	.791	.049	000
SA-227 AC Metro3	PW125-B	APCH	.758	.000	2.167	.217	000
SA-227 AC Metro3	PW125-B	APU	.245	.018	1.209	.120	000
SA-227 AC Metro3	PW125-B	GSE	.154	.046	.424	.010	019

** Denotes User Created Aircraft