



EPA

McFARLAND OUTDOOR AIR INVESTIGATION

(Fact sheet 1 of 2)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY • REGION 9 • JULY 2004

RESULTS OF THE MONITORING OF PARTICULATE MATTER

This fact sheet discusses part of the information we gathered during the McFarland outdoor air investigation. The air investigation consisted of monitoring for **particulate matter** (PM) and air sampling. We are presenting the results in two fact sheets because of the extensive amount of information we gathered. In this first fact sheet, we present results from the monitoring for fine PM that is in the air and can be inhaled. The second fact sheet will provide the results of the air sampling and the school indoor dust screening (*See Preview*). We will also hold an open house in fall 2004 to present all of the results together and address your comments and questions.

WHY AN AIR INVESTIGATION?

In 1997, the U.S. Environmental Protection Agency (EPA) began evaluating the current environmental conditions in McFarland, California in response to a request made by residents. To ensure that human health was protected, we investigated three ways through which contamination can potentially affect people or the environment: drinking water, soil and outdoor air. Air was investigated last and followed the drinking water and soil investigations that were conducted from 1997-2000. For the monitoring portion of the air investigation, we found levels of PM above the federal and state air standards.

Preview: Results of the Air Sampling

The outdoor air sampling was conducted during four different agricultural seasons: July 2001, December 2001-January 2002, March 2002, and May 2002. We tested for nearly 150 chemicals and took more than 900 samples, making this one of the most complete and comprehensive EPA air assessments. In addition, EPA added indoor dust screening to determine if any substances from the outdoor air persist in the indoor environment. *We evaluated all the data from this sampling effort, and found no levels of any of the 150 chemicals that are above EPA's protective health range.*

DEFINITIONS OF WORDS HIGHLIGHTED IN **BOLD** ARE PROVIDED IN THE GLOSSARY ON PAGE 3.

WHAT ARE AIR STANDARDS?

Ambient Air Quality Standards are set at the federal and state level to protect the public health and the environment from pollutants. PM is one of these pollutants. The standard for PM is the level above which breathing the air may cause adverse health effects. The level is the amount of particulate matter (measured in micrograms or μg) found within a volume of air (measured in cubic meters or m^3).

The California Standards, set in 2003, are different from the federal standards mainly because of the many new studies that have become available in the last few years (*See Table 1*). EPA is currently reviewing its federal PM standards, set in 1997, and is required by court order to have revised standards by the end of 2005.

	Ambient Air Quality Standards			
	PM ₁₀		PM _{2.5}	
	California	Federal	California	Federal
Short-term	50 $\mu\text{g}/\text{m}^3$	150 $\mu\text{g}/\text{m}^3$	-----	65 $\mu\text{g}/\text{m}^3$
Long-term	20 $\mu\text{g}/\text{m}^3$	50 $\mu\text{g}/\text{m}^3$	12 $\mu\text{g}/\text{m}^3$	15 $\mu\text{g}/\text{m}^3$

Table 1: Ambient Air Quality Standards in micrograms per cubic meter

WHAT ARE THE RESULTS OF THE MCFARLAND PM STUDY?

From August 2001 through June 2002, EPA studied the levels of PM in the McFarland area at McFarland Middle School. For PM₁₀, EPA conducted daily monitoring over a period of ten months. One reading exceeded the federal short-term (24-hour average) standard of 150 µg/m³. This occurred during a dust storm in May. This windblown dust event covered a large area from the southern end of the Central Valley to Fresno. When readings over the ten month period were compared to the California short-term standard of 50 µg/m³, the standard was exceeded 125 times. Over half of the readings that exceeded the California standard occurred during the dry fall months of September, October and November.

EPA estimated an annual average to obtain a long-term value for PM₁₀ to understand what might be the health effects of exposure. Based on the collected 10-month data, the estimated value of 56 µg/m³ is above the federal (50 µg/m³) and state (20 µg/m³) standards and similar to values in the rest of the valley.

For PM_{2.5}, air samples were collected in 15 to 22 day periods. No samples exceeded the federal or state short-term standard for PM_{2.5}.

WHAT ARE THE HEALTH EFFECTS OF EXPOSURE TO PM?



Various health problems have been associated with exposure to PM when it is above the standards.

Exposure can vary between hours or days (short-term) or over years (long-term). Particles such as PM₁₀ and PM_{2.5} are small enough to get into the lungs, where they can aggravate respiratory conditions such as asthma and bronchitis.

“Sensitive populations,” such as people with heart or lung disease, the elderly, and children are at the highest risk from exposure to both PM₁₀ and PM_{2.5}.

In addition to health problems, PM is also a major cause of reduced visibility or haze. Particles can be carried long distances by wind and settle on ground, water, and structures, which can cause damage to sensi-

tive forests and farm crops, and changes in diversity of ecosystems.

WHAT ARE THE SOURCES OF PM IN THE MCFARLAND AREA?

The air in McFarland is similar to the air throughout the San Joaquin Valley. Geography, weather and PM sources, as described later, across the entire area affect air quality. The valley is the largest air basin in the country at 25,000 square miles, and is surrounded on three sides by mountains. These mountains trap air pollution, swirling it around but not allowing it to flow out of the valley. The typically hot and dry weather in the valley increases the formation of some types of air pollution. In addition, the weather also creates high pressure zones in the atmosphere contributing to temperature inversions, an effect that further tends to trap and stagnate air.

The valley has the third highest concentration of PM nationwide, ranking behind Phoenix, Arizona and the greater Los Angeles area. Sources of PM may include dust and pollution from construction practices, agricultural practices (including burning), paved and unpaved roads, and residential wood burning. PM in the San Joaquin Valley is also formed in the atmosphere, when ammonia from sources such as cattle and chicken waste combines with other gases (nitrates) that are generated by many sources including motor vehicles, diesel trucks, power plants and manufacturing facilities.

WHAT IS BEING DONE ABOUT THE AIR QUALITY IN THE SAN JOAQUIN VALLEY?

Federal, state, and local agencies are working together to improve air quality in the San Joaquin Valley as a whole and this will benefit the McFarland area.

At the federal level, EPA has approved the San Joaquin Air District’s 2003 air pollution control plan, which will reduce particulate matter in the valley. More information can be accessed at <http://www.epa.gov/region9/air/sjvalleypm/>. EPA has national efforts to reduce PM and also a fuel and vehicle program. More information can be accessed at <http://www.epa.gov/air/urbanair/pm/effrt1.html> and <http://www.epa.gov/otaq/>. We will bring information about these programs to the Fall 2004 open house.

At the state level, California sets standards and implements programs for motor vehicle emissions, smog checks and agricultural burning through the Air Resources Board and Bureau of Automotive Repair.

At the local level, the San Joaquin Valley Air District permits and regulates air pollution from stationary sources, such as factories and plants, as well as from wood burning fireplaces, stoves and heaters. The District also conducts public education and outreach efforts such as Spare the Air, Wood Burning, smoking vehicle voluntary programs, and for dust control.

WHAT CAN YOU DO?

The San Joaquin Valley Air District forecasts air quality on a daily basis using EPA's Air Quality Index (AQI). Because of health effects associated with short-term exposure to PM, it is important to be aware of daily levels of PM. Due to the complex geography of the San Joaquin Valley, PM levels can be in the unhealthy range at any time during the year. Community members should check the AQI daily, to see if the air quality is expected to be above the standards. If the air quality is above the standards, then it may be in the unhealthy range and outdoor activities should be limited especially for children, elderly, and people with respiratory conditions.



The forecasted AQI (See Table 2) is typically featured on the weather page of local newspapers, and in *USA Today* and on the *Weather Channel*. In the San Joaquin Valley, residents can call the district's toll-free automated air quality information line, which is updated daily, at 1-800-766-4463. This information line provides information in English and Spanish. Air quality information is also available on the district's web site at www.valleyair.org.

Other simple steps that can be taken to help reduce air pollution around the home are to keep your home smoke-free (<http://www.epa.gov/smokefree/index.html>), stop burning wood in the fireplace, use water-based paints instead of oil-based paints whenever possible, and use electric or manual yard tools instead of gas-powered ones.

GLOSSARY

Air Quality Index (AQI): The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is and recommends precautions based on the air quality.

Ambient Air Quality Standards: The Clean Air Act requires EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. PM is one of these pollutants. Standards are the maximum levels above which pollutants should not be in the air. For example, the air should not contain more than 50 µg/m³ of PM-10 (on an annual average basis).

EPA Protective Health Range: For a chemical which can cause or increase the incidence of cancer, the health range is the level of the chemical in the environment that EPA considers protective. When the level of the chemical is within the protective health range, it poses no significant immediate or long-term risk from exposure.

Particulate Matter (PM): Particulate matter (PM) is a mixture of solid and liquid particles found in the air. While some particles can be seen as dust or dirt, others are about one-seventh the diameter of a human hair (PM₁₀) or even smaller (PM_{2.5}).

Air Quality Values	Air Quality Description	Precautions
0-50	Good	None
51-100	Moderate	Extremely sensitive children and adults, especially with respiratory diseases such as asthma, should consider limiting outdoor exertion.
101-150	Unhealthy for Sensitive Groups	Sensitive children, adults and especially those with respiratory diseases such as asthma, should limit prolonged outdoor exertion.
151-200	Unhealthy	Sensitive children and adults should avoid outdoor exertion and everyone else should limit prolonged outdoor exertion during peak ozone periods.
201-300	Very Unhealthy	Sensitive children and adults should avoid outdoor activities and remain indoors. Everyone else should avoid outdoor exertion.
Over 300	Hazardous	Everyone, especially children, should avoid outdoor activities and remain indoors.

Table 2: EPA Air Quality Index for Particulate Matter

McFARLAND OUTDOOR AIR INVESTIGATION RESULTS

FOR MORE INFORMATION

If you have questions or concerns about the McFarland Investigation, please do not hesitate to contact any of the people listed below:

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You may contact either Bruni or Hector toll-free at (800) 231-3075.
Please leave a message and your call will be returned.



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