

## Bad chemistry took over in Valley's terrible air siege

By Mark Grossi

An early November pollution siege left people coughing, sneezing, rubbing their eyes and scratching at rashes. Strangely, it started with the first real storm of autumn in the San Joaquin Valley, not a cloud of fireplace soot.

The lung-tingling eight days caused patient loads to increase up to 30%, say allergists and other doctors. It kicked off the Valley's most dangerous air pollution season — November through the end of February — when fireplace soot, diesel specks and chemical debris can hang in the air for weeks at a time.

The microscopic debris, called PM-2.5, collects in the air during stagnant, often foggy weather, sometimes making Thanksgiving and Christmas miserable. The specks can pass through the lungs and into the body, causing lung and heart problems.

This pollution is responsible for most of the 800-plus premature deaths blamed on dirty air in the Valley.

But the early November outbreak of PM-2.5 might have been puzzling because the [San Joaquin Valley Air Pollution Control District](#) had just begun its latest campaign to blunt these pollution attacks, enforcing stricter wood-burning rules that started this month. So if it wasn't fireplace soot, what was it?

It was all about chemical reactions that created microscopic ammonium nitrate — a nasty melding of ammonia and oxides of nitrogen or NOx, says the district.

The chemical forms as sunlight hits the Valley's abundant ammonia and NOx in the moist air. As the nation's leader in dairy production, the Valley air has a lot of ammonia from animal waste. Ammonia also comes from the moistened soil and from vehicles. NOx from vehicles and industries is a common problem here, too.

The storm and stagnant weather afterward just set the stage. Atmospheric chemistry took over.

"This type of episode has happened before when you have these conditions," says district health science adviser David Lighthall. "You get an early November rain after a dry period, then the weather pattern gets stagnant and warm."

Research indicates ammonium nitrate is not as dangerous as the black carbon from fireplace soot or the toxics in diesel exhaust specks, says Lighthall. But it still causes an immune system reaction, especially when people are exposed to it for more than a week.

[For eight days](#), the debris peaked several times above the federal daily PM-2.5 health standard in Fresno, Clovis, Bakersfield, Visalia, Porterville, Madera and Turlock.

When people breathe these specks into their lungs, the chemicals change into a type of organic compound known as quinones, which build up in the body, Lighthall says.

"They create a cascade of immune system responses," he says.

That's a pretty good description of what happened in the Valley during the siege, doctors say. They reported an increase in patients with allergic reactions.

Dr. Mario Martinez, a clinical professor at the University of California at San Francisco's Fresno Medical and Research Center, sees patients at the Adventist Medical Center in Reedley. He says farmworkers and their families visited the center with many kinds of health issues.

“A lot of children have rashes,” he says. “People also need treatment for breathing problems. For people with lung problems and for people with general health problems, this was a bad stretch of air pollution.”

Dr. A.M. Aminian, a longtime Fresno allergist, says this already is one of his busiest seasons. He says the problems create a domino effect of symptoms from itchy eyes to labored breathing to sleepless nights. Some patients develop bronchitis or pneumonia.

He says people with allergies need to avoid vigorous outdoor exercise, stay on medications, get a flu shot and change the filters in their heating systems. He also advises people to shower and rinse their sinuses when they go back inside for the day after being outdoors.

It is important to keep humidity between 38% and 40% in your home, Aminian says. He advises people to purchase an indoor humidity gauge from a hardware store.

“You don’t need to buy a humidifier,” he says. “You can set out bowls of water or boil a kettle of water. Your respiratory system needs some moisture to function well.”

The air district suggests people keep an eye on the hourly air pollution updates, found on the agency’s web site under [the Real Time Air Advisory Network](#) or RAAN. Through the site, people can [sign up for air alerts on email](#).

“Our message to people is to follow RAAN and drive less,” says district spokeswoman Jaime Holt.

The RAAN guidelines outline the pollution levels that are unsafe for outdoor activities, such as sports practices and events. The district alerts schools and the rest of the community when pollution is spiking, but air officials have no authority to stop activities. School districts decide when children are kept inside.

That’s not enough, says the [Central Valley Air Quality Coalition](#), representing 70 community, medical, public health, environmental and environmental justice groups. The coalition says the air district also should issue a strongly worded call for cancellation of sporting events on bad days.

Even if schools stop activities on bad days, some children are still left vulnerable, as they were earlier this month, the coalition says.

“The kids who fell through the cracks were those in privately run soccer leagues on Saturday morning,” says coalition member Kevin Hall.

In Selma, Carolyn Harris, 69, who has breast cancer, says it is time to get serious about air pollution cleanup. The Valley’s air quality has contributed to a further breakdown of her health in her fragile condition, she says. Earlier this month, she spent nine days in intensive care with respiratory failure.

She says she’s not the only one suffering. She worries about children growing up in these conditions.

“Who are we kidding here?” Harris asks. “Why do we need leaf blowers in schools around our children? Why do we need drive-up windows? When are we going to do something about our problems here?”

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