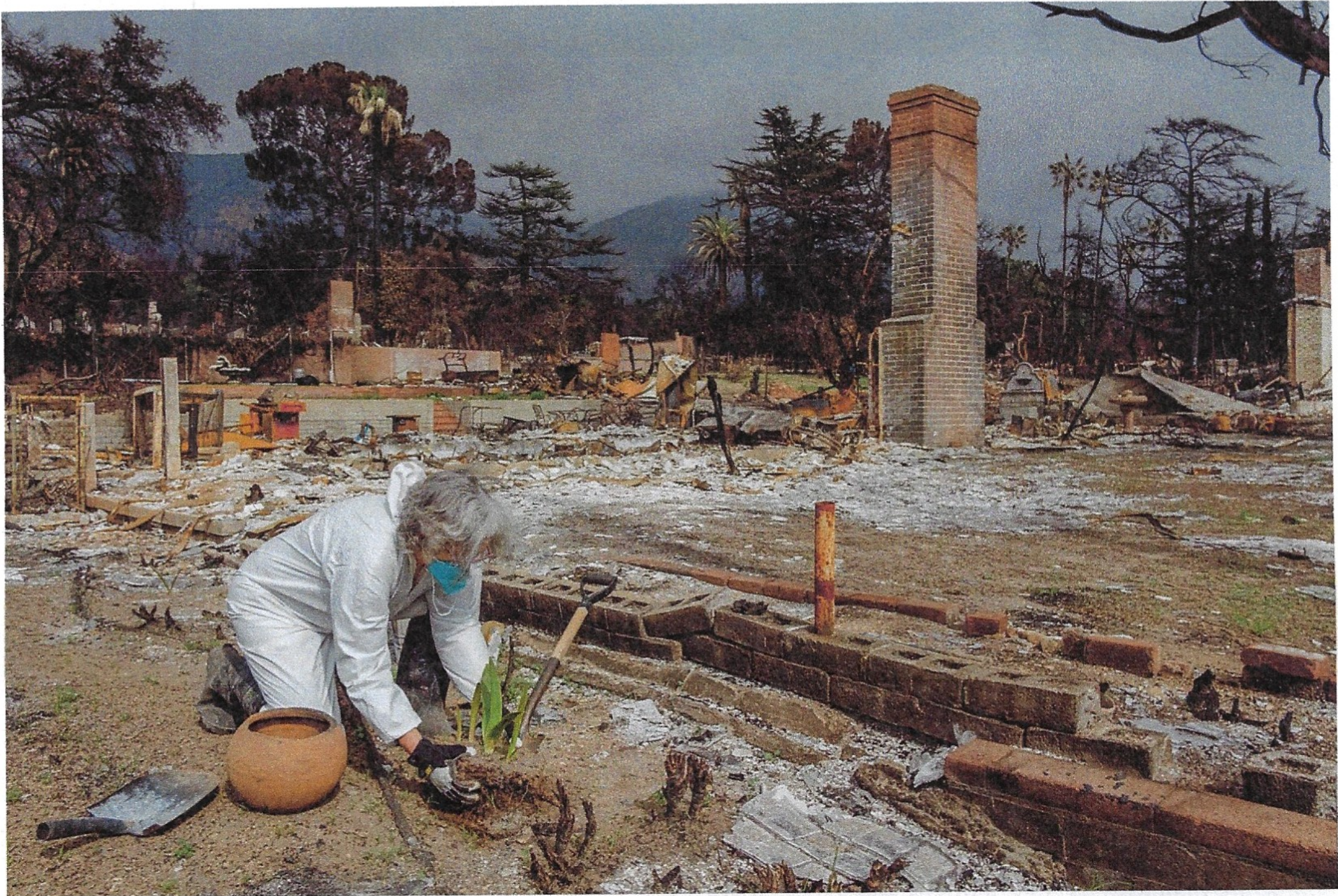


CALIFORNIA

An anxiety lingers after wildfires about pollutants left behind in soil



A resident inspects a plant and the soil on her property destroyed by the Eaton fire in Altadena, Calif., on March 1. Residents and scientists worry that toxic pollutants may linger in burned areas even after tons of ash, debris and tainted soil are cleared away. PHOTOS BY MARK ABRAMSON — THE NEW YORK TIMES



Mark Goldschmidt, a retired landscape architect, surveys his property destroyed by the Eaton fire in Altadena on March 2.

BY LIVIA ALBECK-RIPKA AND JESUS JIMÉNEZ

THE NEW YORK TIMES

ALTADENA, Calif.>> At a glance, the community garden plot appears bountiful. Its beds, flanked by lavender plants, are lush with parsley, lettuces and kale that are weeks overgrown.

But a sign on the gate forbids entry, describing the site as “DANGEROUS TO YOUR HEALTH.”

In the foothills of the San Gabriel Mountains, the Altadena Community Garden is adjacent to the more than 14,000 acres that were scorched by the Eaton fire in January. Across the road are burned-out homes, crumpled roofs and the husks of cars.

State and federal leaders have touted the speed with which cleanup efforts have occurred here and in Pacific Palisades, where a separate fire burned more than 23,000 acres. President Donald Trump made clear in January that he felt residents should be able to rebuild immediately, and California Gov. Gavin Newsom said last month that hazardous waste had been removed at “a record pace never seen before at this scale.” *

Still, fears abound that pollutants could linger on the land long after federal authorities clear about 4.25 million tons of waste from the two fires, including ash, debris and topsoil. What if, after the cleanup, toxic pollutants remain behind?

"We want to be able to plant fruit trees that we can use," said Laura Siahaan, an Altadena mother of two children who lost her home in the fires. "We want our kids to be able to play outside."

Rebuilding, in her mind, means "not having any toxic remnants from this fire that follow us for years."

This concern is at the crux of a new dispute. Federal officials are not planning to test the topsoil that is being removed, they said, nor will they test the soil that remains. That approach, they said, has been standard since 2020.

Curtis Brown, the Federal Emergency Management Agency officer responsible for coordinating federal recovery efforts in areas affected by the wildfires, told California officials last month that removing the topsoil was sufficiently protective, and that testing the soil would have meant delaying the rebuilding process by months. After past fires, he said, soil testing mainly found contaminants that were already present in the soil before fires broke out. *

State leaders, however, say it is crucial to test the soil that is left behind. And many residents, already questioning whether they want to return and rebuild, are anxious to know whether the current cleanup efforts have made their properties safe.

Wildfires, particularly those in densely populated areas, incinerate common household objects and construction materials, including PVC pipes, appliances, batteries and paint. The combustion of these materials can release pollutants, including heavy metals such as lead and arsenic, as well as PFAS, a class of chemicals found in some common household items, including some carpets and clothing. Asbestos, sometimes present in older buildings, may also be released.

These contaminants — some of which have been linked to cancer, stunted development and birth defects — can leach into the soil and into stormwater runoff. Some may already be present in soil, but scientists say that wildfires can increase their concentrations to potentially hazardous levels.

People may be exposed when they inhale dust or eat produce grown in the soil, three experts said in interviews. Children playing outside may be at risk of ingesting contaminated dirt.

Various groups of researchers are now offering to test residents' soil in the absence of federal testing.

They are planning to collect samples on a broader scale than was sought by state leaders, including properties where houses survived the fires and soil that is not adjacent to a building that burned down.

Some homeowners have taken matters into their own hands by hiring private contractors to examine their soil. The Los Angeles County Department of Public Health has hired a private firm to conduct tests on about 80 properties affected by the fires, although the county said its action was not in response to FEMA's determination.

Kristy Brauch, a nature educator who put out a call for fire-affected residents to collect soil, said she sees the samples as an insurance policy, in case data is needed about the levels of contamination in the soil, especially if any pollutants are found to exist in hazardous amounts.

"The worst-case scenario is they're not going to do anything," Brauch said of the federal authorities. "And we're going to find out we're Flint, Michigan, five years from now, and people are sick."

Whether or not the remaining soil on burned land is tested, it is safe to assume the soil is toxic at some level, said Anthony Wexler, director of the Air Quality Research Center at the University of California, Davis. *

"The question is: Is that harmful to people?" Wexler said. "If it's not disturbed, it basically won't be harmful."

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People at the most risk include workers involved in the cleanup and rebuilding efforts. Wearing appropriate protective equipment and wetting down the earth before work begins can help mitigate the risk, Wexler said. Residents of fire-affected areas should also keep their windows closed and run air purifiers when construction occurs nearby, he said.

For all that, though, Wexler suggested that it may not be worth testing the soil, because the results of such tests can be difficult to interpret and may miss some contaminants.

"I'm not so sure that testing the soil is going to get you anywhere, other than freaking people out, because people are still going to want to rebuild," he said.

The federal decision to forgo testing emerged last month in correspondence between California officials and FEMA, which is funding the cleanup efforts. The letters were first reported by the Los Angeles Times.

Nancy Ward, director of the California Governor's Office of Emergency Services, wrote that data from past wildfires showed that pollutants could be present at depths exceeding 6 inches, the thickness of soil that is being removed.

"Without adequate soil testing, contaminants caused by the fire can remain undetected, posing risks to returning residents, construction workers and the environment," she said.

The state of California and local governments are welcome to test the soil on their own. Brown wrote in response, but FEMA would not reimburse them for such efforts. The agency, he wrote in the letter, had not paid for soil testing in areas affected by wildfires in California for several years.

Before 2019, FEMA would remove 3 inches of soil, test it, then remove about 3 more inches and test it again, according to Brown. That practice ended after the 2018 Camp fire in Northern California. Doing it that way, Brown wrote, "was tedious, inefficient and a barrier to timely cleanup and recovery."

He said in his letter that Environmental Protection Agency officials determined that going ahead and removing 6 inches of soil without stopping for testing would "necessarily abate threats from the debris."

The federal agency is following that approach in neighborhoods affected by the Palisades fire as well as the Eaton fire. The city of Los Angeles, which includes Pacific Palisades, has not said whether it plans to do any soil testing of its own.

After the Camp fire, which killed 85 people and destroyed more than 18,000 structures, an assessment of residual ash in the soil found metal concentrations that were above, and in some cases "significantly above," what they had been before the fire. The effects of wildfires on soil chemistry tend to be poorly monitored and rarely factor into post-fire recovery efforts or risk assessments, according to a 2024 study led by researchers at Stanford University and Colorado State University.

Thomas Borch, a soil chemist at Colorado State and one of the study's authors, said it was difficult to comprehensively test soil after a wildfire, given the many kinds of pollutants that are released and how much their levels can vary even on a single property.

After the 2021 Marshall fire between Denver and nearby Boulder, his team tested soil in gardens near burned structures. The results were reassuring: Although the samples showed elevated levels of heavy metals, they were not high enough to pose a risk to human health.

Borch's team is now studying properties affected by the Eaton fire, and so far, only a few sites have shown elevated concentrations of heavy metals. Still, he cautioned, surveys can miss spots where pollutants may be extremely concentrated — for example, the soil beneath the melted battery of a Tesla electric vehicle. And windy

conditions or heavy rains can spread contaminants far beyond burned structures. So, for these reasons, Borch said, the best way to know whether a site is contaminated is to test it individually.

