



# TOXIC-FREE HOMESTEADING

By Molly Absolon

Lisa Johnson noticed the fumes within hours of her exposure. She quickly moved out of the caretaker's house at Independence Mine State Historical Park on Hatcher Pass in Alaska, but the damage was done. A fuel leak under the building had filled it with diesel fumes, triggering a series of subsequent health problems for Johnson. She experienced headaches, vertigo, fatigue, ringing in

her ears, and dizziness. Her symptoms intensified whenever she was near any petroleum-based product. She says she can still tell, when she walks into a house, if the owner cooks with gas by the way her body reacts.

Johnson's exposure, which took place in the 1980s, changed her life. For her health and wellbeing, her homes now have to be

chemical free. Since the incident on Hatcher Pass, she has lived in three different houses in the Jackson Hole region. One was an old house in Victor that she and her husband gutted and renovated to accommodate her sensitivities. The second, a home they had built from the ground up in Alta, was constructed with chemical-free materials. And the third, their current house in Jackson, was renovated to remove any potential irritants.

"I react to chemicals most people have no reaction to," Johnson says. "My duty is to make sure my home is not assaulting me."

The link between health and home hasn't always been well understood, but that is changing. Today the World Health Organization attributes 3 percent of all diseases in the world to indoor air pollution, and researchers are exploring the link between indoor air quality and the increase in autism, asthma, and other autoimmune disorders.

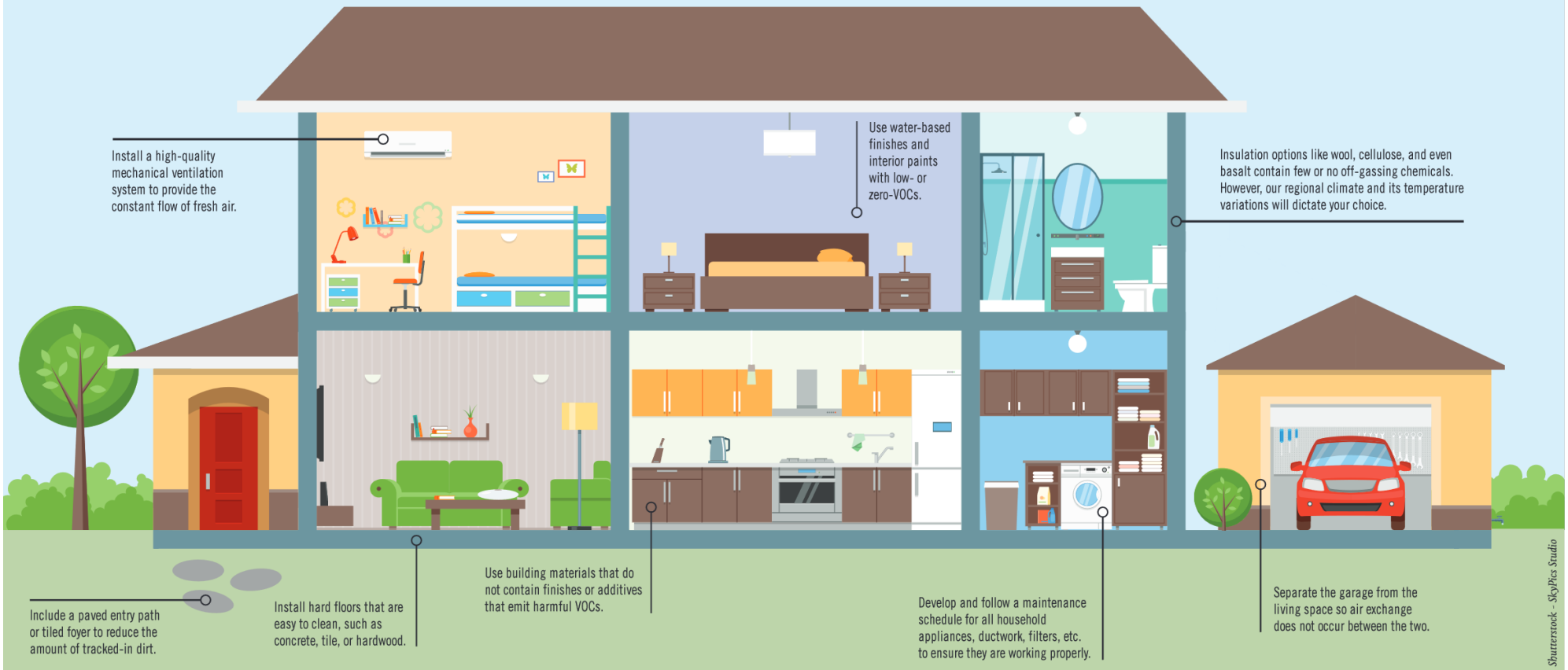
## What's Inside the air?

"We are now passing on remnant chemicals to our offspring,"

says Meghan Hanson of Natural Dwellings Architecture, a regional firm that operates in Wyoming, Idaho, and Montana. "Babies are born with high levels of toxins in their bodies and there is more asthma and disease among children than there was a generation ago."

Hanson says it's not easy to make a causal link between these increases and indoor air quality, but she's convinced that our houses have an impact on our health. "The green-building movement emphasized airtight homes, which is good for heating and energy efficiency, but not so good for air quality," Hanson says. "People started getting sick as homes became tighter. You've heard of the expression 'sick-house syndrome'? This made people realize that we need fresh air inside our homes and workplaces to stay healthy."

The Environmental Protection Agency (EPA) estimates that, on average, indoor air is two to five times more polluted than outdoor air. With the average American spending as much as 90 percent of his or her time indoors, that means many people are being exposed to dangerous pollution in the place they consider most safe: their



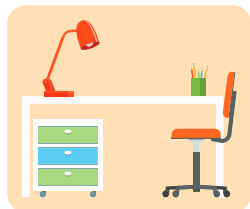
homes.

Indoor air pollution comes from a variety of sources, ranging from cooking odors to cigarette smoke, heating units, cleaning products, woodstoves, and scented candles. It includes off gassing from the glues, paints, and finishes found in our furniture, carpets, and wall coverings, as well as from the building materials used to construct our homes. Volatile organic compounds (VOCs) are the primary culprits. VOCs are found in countless common household products and include a variety of chemicals—such as formaldehyde, benzene, and vinyl chloride—known to have both short- and long-term health effects. Surveys have found that many homes contain air with VOC levels exceeding those acceptable for human health.

The way people react to indoor air pollutants can vary widely. Johnson says she's the canary in her clan. No one else in her family seems to be affected by chemicals, but she believes that her husband and two sons will also benefit from the lack of exposure to pollutants that make her ill.

#### What's IN the Materials?

Larry Thal, of Sunlight Design in Wilson, strives to avoid putting the "bad stuff in in the first place," but that's not always easy. "Good indoor air quality, just like energy efficiency, light, etcetera, are all part of good design," Thal says. He explains that supply-chain materials are not always labeled and that it's often hard to get plywood without formaldehyde glue at the local lumberyard—you



often need to special order it. "That's not to say it isn't getting easier to find green materials," he says. "It is. Now, for example, you can get plywood that has been certified by organizations like Green Guard to be formaldehyde free, but it takes some effort."

The balance between cost and minimizing toxins in building materials has always challenged builders. Brady Barkdull, project manager for Snake River Builders, says some buyers demand chemical-free products and are willing to pay the price, but he guesses they are the minority. Lots of people don't even know to ask. "The value is often not visible or tangible," he says. "We have to educate people [about green products]. It's not just a sales pitch."

"We're under a lot of pressure to keep costs down," says Barkdull. "It costs more to build here than in, say, Idaho Falls." He explains that labor is more expensive, materials cost more, and we have more snow load requirements—all factors that drive up costs. "It's a trade off," he says. "We encourage people to consider living with less square footage so they can afford higher quality materials, but it can be hard to get some people to pay a premium."

Jim and Jan Pitsch—self-described "urban refugees from Illinois"—built their dream house in Alta. Jan Pitsch has chemical sensitivities and autoimmune issues, so they aimed to minimize the chemicals present in their living space. Their smaller home design helped them accommodate their desire to have a house that's as green and toxin-free as possible. "It cost quite a bit more than a conventional home," explains Jim. "But because of the small size of the house, we

were able to achieve what we wanted."

#### What Are the Alternatives?

Johnson rates building materials on a spectrum from bad to good. The worst materials off-gas VOCs. She believes these materials shouldn't be in anyone's home, especially someone with chemical sensitivities. On the other end of the spectrum, you find materials that contain no chemicals at all. In between are low-VOC-emitting products that off-gas for a few days before becoming inert, or materials that can be sealed so that gases don't enter the living space. What you choose for your own home depends on your budget and your health.

A good ventilation system that brings fresh air into the house without having to open the windows is also critical to a healthy home. That's why Teton County, Wyoming, and Teton County, Idaho, have building codes that require mechanical ventilation in new homes. Exhaust air has to be vented directly outdoors, and fresh outdoor air has to be circulated throughout the home at a continuous rate determined by the building's square footage and the number of bedrooms it contains.

There are a variety of ways to provide ventilation, but the most effective is either a heat-recovery ventilator (HRV) or an energy-recovery ventilator (ERV). Both pull fresh air into a home while simultaneously pushing out stale air.

"People [today] are much more aware of indoor air quality," says John McIntosh, owner of Snake River Builders. "It used to be that we had to bring it up. Now people are asking for it." But he adds that builders can only do so much. The people who live in the houses also have to pay attention to what they bring inside if they want to maximize their air quality.

Hanson agrees. "A home is only as good as the people who live in it," she says. "We need to do a better job of educating homeowners. If they don't follow through on things—if they don't change the filters on their ventilation system, for example—it doesn't matter how good the house is. As an industry, I'd say education is one of our weak points."

#### Taking the LEED

LEED, or Leadership in Energy and Environmental Design, pioneers the way in identifying materials, procedures, and standards to help improve home safety and to minimize the impact of construction on the planet. For a building to be fully LEED certified, it has to meet a checklist of criteria that includes everything from where materials come from, to the building's access to bike paths, to the use of low-emitting paints and finishes. Full LEED certification can be an expensive process, and many homeowners opt not to pay the extra cost. But the LEED checklist provides a valuable resource for building green and minimizing toxicity.

The WELL Building Standard, which is administered by the Green Building Certification Institute that also administers LEED, is a newer program that measures, certifies, and monitors "features of the built environment that impact human health and wellbeing through air, water, nourishment, light, fitness, comfort, and mind." The program focuses its attention solely on the health and wellness of building occupants.

Hanson, who is a LEED-accredited professional, says she doesn't know much about the WELL Building Standard, but she's keen to learn more. For now, the information available online is another resource for people looking to minimize the toxicity of their homes and improve their health and wellbeing. **tf**

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