

# Flowing Downstream: The Case of the Hidden Flood

by Peter Sierck

▶ Peter Sierck is the director of Environmental Testing & Technology Inc., an investigative and consulting service for indoor environmental problems based in Carlsbad, Calif. Sierck, a registered environmental assessor and a certified indoor air quality professional, has conducted indoor air quality, moisture and mold investigations for more than 15 years.

**I**t happened in a beautiful house in Santa Monica, Calif., where a major remodeling had just been completed. The home featured an open space design with a generous sunk-in living room, a formal dining room with fireplace, a kitchen with granite countertops along all four walls with artistically painted cabinetry and a library on the first floor. The contemporary style was complemented with a rare maple hardwood floor throughout the house. Just one little detail was missing: the new sink did not have a water spray fixture.

Four days after the homeowner moved into the house, they contacted a plumbing company and inquired if a water spray fixture could be installed in the present sink assembly. The plumber inspected the sink and decided that it could be done with some welding work. The homeowner authorized the work to commence the next day.

The day after the plumbing company installed the

water spray fixture, the kitchen sink cabinet was flooded. The water seeped into the cabinets and under the hardwood floor in the kitchen. Immediately, the plumbing company contacted a flood restoration company and the drying process began. Dehumidifiers and blowers were utilized to facilitate the drying. Since the flood had happened in the kitchen, it was decided that the drying efforts would be limited to the kitchen area only. The drying process lasted for nearly three weeks.

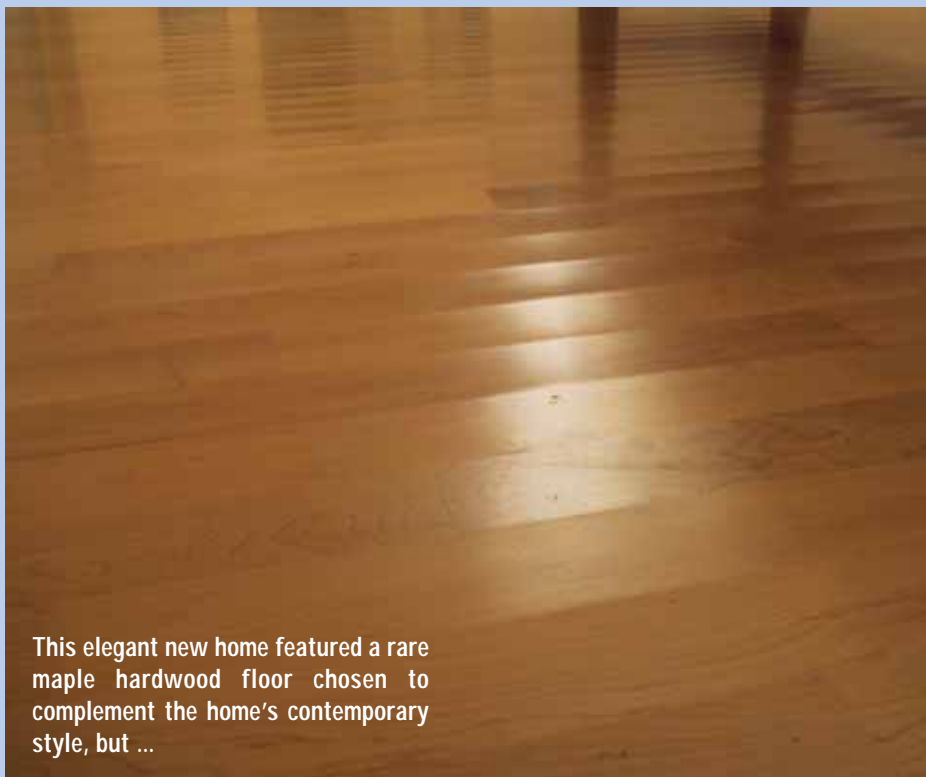
Soon thereafter, the homeowner noticed a lingering odor and contacted an industrial hygiene company to investigate. During the walk-through, it was noted that the hardwood floors in the dining room and sunk-in living room showed signs of cupping (warping). Subsequent moisture testing showed elevated moisture readings at the dining and living room hardwood floors while the kitchen floors were dry. No visible mold growth was observed in the accessible areas. It was also noted that drywall sandwiched behind the kitchen cabinet's back wall still tested wet when compared with reference areas.

The spore trap air sampling results yielded no elevated spore counts. However, the culturable air sampling results yielded a predominance of *penicillium* and *aspergillus* species, indicating the presence of fungal amplification sites.

### Problem Opened to Further Testing

It was decided that destructive testing was necessary to evaluate the conditions present under the hardwood floor. The floor was installed on a sleeper system, where wood slats called sleepers are placed on the concrete slab, 3/4-inch plywood is placed onto the sleepers and the 3/4-inch hardwood boards are nailed into the plywood. The flooring system did not allow individual floorboards to be removed for inspection, so small portable containments were built for exploratory cut-outs in the dining and living room.

Once opened up, visible fungal growth was present on the



This elegant new home featured a rare maple hardwood floor chosen to complement the home's contemporary style, but ...

plywood sheeting and the sleepers. The readings of the moisture measurements in the sleepers and in the plywood were elevated and a laboratory analysis of the surface samples collected confirmed the presence of *penicillium* and *aspergillus*. Removal of the drywall sandwiched behind the cabinet also revealed active mold growth on the drywall materials.

It was suspected that the water had traveled throughout the first floor. More exploratory cut-outs confirmed that theory. The flood had affected the entire hardwood floor on the first floor and removal and reinstallation was recommended. The kitchen cabinets were removed to replace the swollen particle-board and the moldy drywall.



... There was nothing elegant about the extensive mold revealed beneath the hardwood floor.

### Not to be Underestimated

By this point, the heavily inconvenienced homeowner demanded that the plumbing company cover all costs. The plumbing company then filled a claim against its liability insurance to cover all associated costs. In the end, the insurance company paid a total of \$170,000 for costs that included: charges for the initial drying, industrial hygiene investigation and sampling, moving and storing costs for the contents, proper accommodation for the homeowners during the floor replacement, removal of kitchen cabinets for remediation of the drywall, removal of the entire hardwood floor, replacement of sub-floor plywood and sleepers, replacement of part of the wood flooring which was not in reusable condition, drywall reconstruction and reinstallation costs for the kitchen cabinets, hardwood floor reinstallation costs, touch-up repainting fees and final cleaning.

The bill was enormous because the distance water can travel under hardwood floors had been underestimated. Also, materials that were enclosed and could not easily be dried should have been identified and

adjustments made to the drying procedures and methods. Finally, no flooring specialist or industrial hygiene company had been contacted during the drying.

So what is the moral of the story? It is of utmost importance to initially identify the extent and degree

of all water-damaged materials to provide an accurate scope for the technical drying efforts. This also provides a baseline to verify that the affected materials are dry. The use of infrared imaging devices and penetrating and non-penetrating

moisture testing devices could have eliminated the additional damage, the mold remediation and flooring system replacement costs. When moisture is detected early, hardwood floors with sleeper systems can usually be dried in place since air movement is possible throughout void spaces.

After months of inconvenience and legal maneuverings, the homeowners could finally move back into their newly remodeled home for the second time. The water spray fixture in the kitchen works well and they do not want to hear the word “mold” ever again. <sup>m<sup>3</sup></sup>

“Once opened up, visible fungal growth was present on the plywood sheeting and the sleepers. The readings of the moisture measurements in the sleepers and in the plywood were elevated.”