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HEADLINE**:  TCE removal in mid-Missouri community proves how difficult toxic cleanup can be**

By: Sarah Hallam, Isabel Lohman, Shoshana Dubnow, and Fengjiaxin Li

CAMDENTON, Mo.—Debbie Henry-Monnahan remembers playing in the stream next to the manufacturing factory that her mother worked at when she was a little girl.

“My mother worked at the plant for ten years,” Henry-Monahan said. “I got off the bus there five days a week. Played in the stream, played in the parking lot where they were dumping that, I saw them dumping it, didn't know what it was.”

What Henry-Monnahan was referring to, and what she now knows, is trichloroethylene.

Trichloroethylene or TCE was used as a popular solvent for years in the United States. The chemical is known for its capabilities to remove grease from metal parts.

In the manufacturing factory that her mother worked at, TCE was used on a regular basis to degrease heating and cooling appliance parts. That wasn’t uncommon for the time. Across the country, TCE was used for a variety of different jobs and could be found in many places-- from industrial factories to local laundromats.

TCE was so commonly used that disposing of it became a challenge. It wasn’t uncommon for firms to dispose of it outside. The plant where Henry-Monnahan’s mother worked was no different.

“When we finished with a tub of trichloroethylene, once it became saturated with oil, we took that barrel to the back door and dumped it out,” said Jerry Rogers, a former supervisor at the factory. “We have literally dumped thousands of gallons out the back door.”

Weihsueh Chiu is a toxicology researcher at Texas A&M University and formerly led a task force conducting TCE risk assessments for the Environmental Protection Agency. Chiu has found evidence in his studies that exposure to TCE can be linked to some forms of cancer.

“It’s classified as a known human carcinogen, in terms of the cancer effects,” Chiu said. “The strongest evidence is for kidney cancer, lymphoma and liver cancer, as well as some evidence for non-cancer effects.”

What Rogers and his co-workers didn’t know at the time was that dumping all those gallons of toxic waste “out the back door” would also have lasting effects on the environment.

“It’s also sort of a legacy contaminant, because it was improperly disposed of in many of the places it was used in the past,” Chiu said.

In the mid-1990s, the Missouri Department of Natural Resources tested and found TCE at the site of the manufacturing factory at 221 Sunset Drive in Camdenton. Traces of TCE have also been found in other sites around the city. One of those sites is Mulberry Well, which was used as part of the public water system for Camden County residents at the time.

The positive TCE test results led to the shutdown of the Mulberry Well in February 1999.

All five Camdenton sites are being monitored by the department of natural resources for TCE. For some sites across the country, contaminated areas are declared as Superfunds.

Superfund sites are governmental programs designed to fund the cleanup of toxic waste. For instance, all further testing and cleanup of any toxic waste is overseen by either state or federal agencies. The government then works with any responsible parties involved to dictate who pays and monitors the cleanup process.

TCE contamination in Superfund sites isn’t just limited to Camdenton, though.

“More than half of the Superfund sites across the country that are contaminated in soil or groundwater includes trichloroethylene,” Chiu said.

Removing TCE from the environment is complicated, however. David Shorr practices environmental law and said TCE can be especially difficult to clean up when it gets deep underground due to its chemical qualities.

“TCE is a bugger,” Shorr said. “It separates from water, it's heavier than water. It usually goes to the bottom to bedrock. It's difficult to remediate. It's problematic with regard to how you can track it.”

Cleanup for is a long and slow process.

Valerie Wilder, chief of the Superfund Section Unit at the Missouri Department of Natural Resources, has been involved with the removal process of TCE at the Camdenton sites for many years. She’s seen the challenge of removing TCE from the environment firsthand.

“TCE and groundwater sites are very difficult, if not impossible,” Wilder said. “When you say cleanup, like completely remove every drop of TCE, that is not always feasible, but the objective of all the cleanup is to eliminate exposure to human health.”

As for the site around the old factory at 221 Sunset Drive where Henry-Monnahan used to play, the slow removal process of TCE from the land has taken a toll on the town’s economy. The last owner of the building was Modine Manufacturing Co. and it employed hundreds of residents in the town.

In 2016, air quality tests taken by Modine revealed that there were still toxic levels of TCE in the air.

“We were trying to market and get business in there and since Modine announced the air quality test, that's virtually stopped,” Hancock said. “And from the city's standpoint we wish that remediation would take place as quickly as possible on the Modine plant.”

Both of the most recent owners of the plant at 221 Sunset Drive, Hamilton Sunstrand and Modine, have been working in partnership with the department of natural resources since the site was declared a Superfund.

Spokespeople with both Hamilton Sunstrand and Modine have said they are continuing testing around the site at the department of natural resource’s request.

“In 1999, we voluntarily agreed with MDNR to investigate contamination at the Sunset Drive Facility,” said Brian Agen, vice president for human resources for Modine, in an email. “Since then, we’ve worked with MDNR to remove thousands of tons of TCE-impacted soil from in and around the facility, and we continue to work with MDNR to conduct investigations underneath the Sunset Drive Facility, in addition to conducting quarterly sampling at nearby residences.”

But it could be years until the TCE around the site is fully cleaned up.

“Lot of people want to talk about how you are going to clean it up, but the answer is you probably can never clean it up,” Shorr said. “So the best method for dealing with it is make sure you're protecting the people around it.”

TCE removal has been a decades-long process for the Camdenton community, and that is with getting notified of contamination over 25 years ago. But citizens who are fed up with the slow cleanup process have taken matters into their own hands.

James Gohagan is the presiding chair of the Camdenton Industrial TCE Contamination Advisory Team, known colloquially as CITCAT. The team serves as a bridge in communication between the citizens of Camdenton and the department of natural resources about all things related to the Superfund sites in the city.

Gohagan said CITCAT started as a Facebook group of citizens concerned about the lack of action they saw in the cleanup process in the Superfund sites around their homes. After meeting with the department of natural resources and holding a citizen protest outside the city courthouse, CITCAT was officially formed.

“The cleanup plans generally revolve around the plant and that is the main source of contamination right now,” Gohagan said. “We get to make official recommendations on what the cleanup plan is.”

Wilder said the remediation process at the Superfund sites is still in the testing and investigation phase. It is the citizen advocacy in Camdenton that has pushed a decades-long process into a reality.