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Tests shed light on how pCBSA got into St. Louis water

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Drilling deeper into the lower aquifer supplying drinking water to the city of St. Louis has shed light on why traces of a byproduct linked to DDT has been found in several municipal drinking wells.

Scott Cornelius, of the environmental response division, Michigan Department of Environmental Quality, said the latest round in DEQ's investigation discovered the chemical mixture found extensively at and around the former chemical manufacturing site in St. Louis is down in the drinking water aquifer.

"We knew NAPL was out there," Cornelius said. "That it's down in the drinking water aquifer is a new piece of information. This will help us determine how to remediate the situation. This explains how the pCBSA got in the drinking water."

Cornelius said this discovery completes the connection between NAPL and pCBSA and proves a completed pathway exists.

Found is a mixture of DDT and chlorobenzene. It is classified as a non-aqueous phase liquid, or NAPL, because it does not break down in water.

When DDT is manufactured as it was by Michigan Chemical and its successor Velsicol Chemical, a byproduct called para-chlorobenzene sulfonic acid, or pCBSA, was simultaneously produced.

Records show Michigan Chemical had produced such large quantities of pCBSA that it took out a patent. It is not known if pCBSA was used for anything.

The EPA began testing for pCBSA and announced to the city in 2005 that light amounts had been discovered in two municipal wells. Since then, the byproduct has shown up in several more wells at various volumes.

St. Louis and a former chemical plant site in Montrose, Calif., the only two in the country where DDT was produced, are also the only two where pCBSA has been found.

Cornelius, the DEQ project manager of the Velsicol site, has worked with the environmental firm Weston Solutions of Okemos, contracted by DEQ. Their mission is to identify the different chemical contaminants buried at and around the main plant site and determine how far they extend from the site.

Investigators drilled test wells at various locations between the former plant site on the bank of the Pine River and the city wells.

Work is done in phases. Within each phase soil samples are taken. The hope is to find uncontaminated soil to assure the edge of the contamination.

"In this area we hadn't found that," Cornelius said. "Whenever we drilled we found contamination. We continued to drill deeper."

Testing takes in more than the NAPL. "There is a lot of dissolved chemicals in the groundwater that are just as bad," Cornelius said. "We have to determine how deep it is which could be as far down as the bedrock, approximately 300 feet."

Test monitoring wells were drilled near city wells 1,4 and 7, and also in the area of a former warehouse building used by the chemical company south of M-46.

Testing has continued in an area referred to as the "burn pit" west of the river and surrounded by a public golf course.

The area where the EPA had constructed a treatment enclosure while pulling contaminated sediment from the Pine River and hauling it away over a period of several years is now cleared for DEQ to test the soil and aquifers beneath.

Last year the EPA buried sentry wells in several locations around the plant site, in addition to several test wells. Samples are taken monthly and reported to the city. Some findings are reported quarterly.

Finding that come from the EPA and DEQ test wells will provide information necessary for DEQ "to develop five or six cleanup plans" for the contaminated areas, Cornelius said.

Types of contamination newly discovered will be supplemental to a remedial investigation report the DEQ released in 2006. The next step in the government's investigation is a feasibility study to detail options for a cleanup.

"There will be different ways to clean it up," Cornelius said. "We will be using different technologies to address the contamination," meaning one size doesn't fit all.

Besides the DDT and chlorobenzene NAPL, there are so many other contaminants buried at and around the plant site that create a bigger problem.

Cornelius anticipates providing the EPA with a draft for a feasibility study in July for review. A public release will follow. EPA and DEQ officials have been consulting over details for a year.

"The agencies are pretty much in agreement," according to Cornelius.

Testing is continuing at the Velsicol sites even while the study is being worked on.

"It's because this site is complex and costs so much money to investigate," Cornelius said that testing is done in phase. "We pretty much know how wide (the contamination) is. We need to know how deep it is. One of the wells we're drilling will go all the way to the bedrock.

The NAPL discovered so far appears to be similar if not the same as what the EPA pumped out of the river, the project manager said. Test kits taken at the plant site visually shows the NAPL. Until samples come back from the lab will investigators know for certain if the NAPL has the same chemical breakdown as the compound found in the river.

If the NAPL is moving in the sand seam or aquifer, it is moving very slowly. P-CBSA is just the opposite. It is highly soluble and moves quickly. NAPL doesn't move with the groundwater because of its weight and density. It follows a sand seam in the till or flows on top of the till.

Cornelius said the pCBSA is in the NAPL and coming from different areas of the site.

In the near future, the DEQ will increase the number of deep vertical aquifer samplings (VAS) in the area where the EPA had its treatment tent. Sediment and surface water samples will be taken at the creek and drainage ditch adjacent to the golf course and former burn area.

More surface soil sampling will be taken around the adjacent residential area east of the main plant site. A new round of groundwater samples from all new and existing monitoring wells will be gathered. This new round of sampling will be reviewed, resulting in a laboratory analysis.

"This will help us develop our strategy," Cornelius said. "That's the good news."