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Will suburbs clean up water by dirtying land?

By filtering radium, some regulators fear suburbs may create more problems

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From Batavia to Lake Zurich, Chicago-area suburbs have been scrambling to meet a federal deadline to remove radium from drinking water.

But they may be making a dangerous trade-off.

Experts - ranging from regulators to environmentalists - say that in cleaning well-water of the naturally occurring radioactive material, they may wind up creating an environmental hazard for a greater number of people. The problem, they acknowledge, is that the issue is so new that no one has yet examined the ramifications of a piecemeal solution to address a known danger.

Within the next few years, water bill hikes in about 100 well-water communities across the state will go up to pay tens, possibly hundreds, of millions of dollars for new water treatment facilities that will filter out the potentially hazardous element. Dozens of suburban communities are affected.

But filtering radium from the water has sprung a new question: Will the solution in many communities simply transfer the problem from the water supply to somewhere else, possibly affecting far more people?

It could, wary regulators warn.



Waste water sludge is processed at the Batavia Water Treatment Plant before being sent to a landfill.

“Are the municipalities aware of the right questions to ask? No, not really,” says Rich Allen, a top environmental regulator for the Illinois Department of Nuclear Safety, which regulates radioactive materials in Illinois. “A lot of them were in denial. For a long time (before it was clear radium would have to be removed from drinking water), U.S. EPA promised that this problem would go away.”

It didn't.

The hot potato is the radium itself, which collects on filters to form low-level radioactive waste. To dispose of it, many communities plan to mix it with sewage sludge and dump it in landfills or spread it on cornfields.

But that may not be safe, experts say. Sewer pipes could become contaminated with radiation, wastewater workers could be

exposed, runoff from fields could pollute groundwater and streams, and crops could potentially become poisoned, according to state regulators and their documents.

For such communities, safely disposing of concentrated radium might require more spending. No one's sure how much.

“I really believe that some of the communities, if they hadn't been up against this December deadline, they might have taken a look at (other methods),” says Jim Willey, village president of Elburn, which changed its plans at the last minute to adopt a process that avoids the radium-sludge problem.

The communities planning to spread the sludge over land, meanwhile, say they've found themselves caught in a swirl of frequently changing regulations and ambiguous bureaucratic guidelines.

“We’ve never done this type of process before, so it’s definitely a learning process for us,” says John Dillon, water superintendent for Batavia, which is planning to spend roughly \$12.5 million to make its water supply radium-safe.

“We’ll meet all the current regulations, but who knows what the regulations will be a few years from now?”

Case study

Lake Zurich taxpayers are spending about \$1.5 million to install a radium-removal system at two of the town’s wells.

Their situation is typical. The wells draw water up from deep aquifers sandwiched between layers of bedrock that includes seams of granite and clay laced with uranium. The uranium doesn’t get into the water that gets pumped into Lake Zurich homes, but its chemical descendant, radium, does.

Because of the relatively low concentration in aquifers, radium in drinking water remained unregulated for decades. In 1974, the U.S. EPA imposed limits on it.

Studies suggest that, when consumed over a lifetime, for example, radium can slightly increase the risk of bone cancer. But the rules became embroiled in court, and at one point EPA officials suggested looser standards would mean few communities would have to worry about it. It wasn’t until 2001 that the EPA was cleared to fully enforce them, with a December 2003 deadline set.

Lake Zurich’s solution is to install something similar to a water softener. The radium that’s removed accumulates on filters and, every so often, gets flushed down the sewers, where it flows with other wastewater to a treatment plant.

Radium has always been washed down those sewers via toilets and sinks running with well water containing dissolved radium.

“Are we going to be generating any more radioactivity than before? The answer is no,” says Bob Duprey, who deals with water for Lake Zurich. Nothing’s really changed, he says.

Nuclear regulators disagree. The problem, they say, is not a matter of content but of concentration.

A new problem

“If you’re doing treatment (to remove radium), you wind up with batches,” says Allen, the nuclear safety regulator. He’s referring to clumps of sludge flushed off a radium-removal filter.

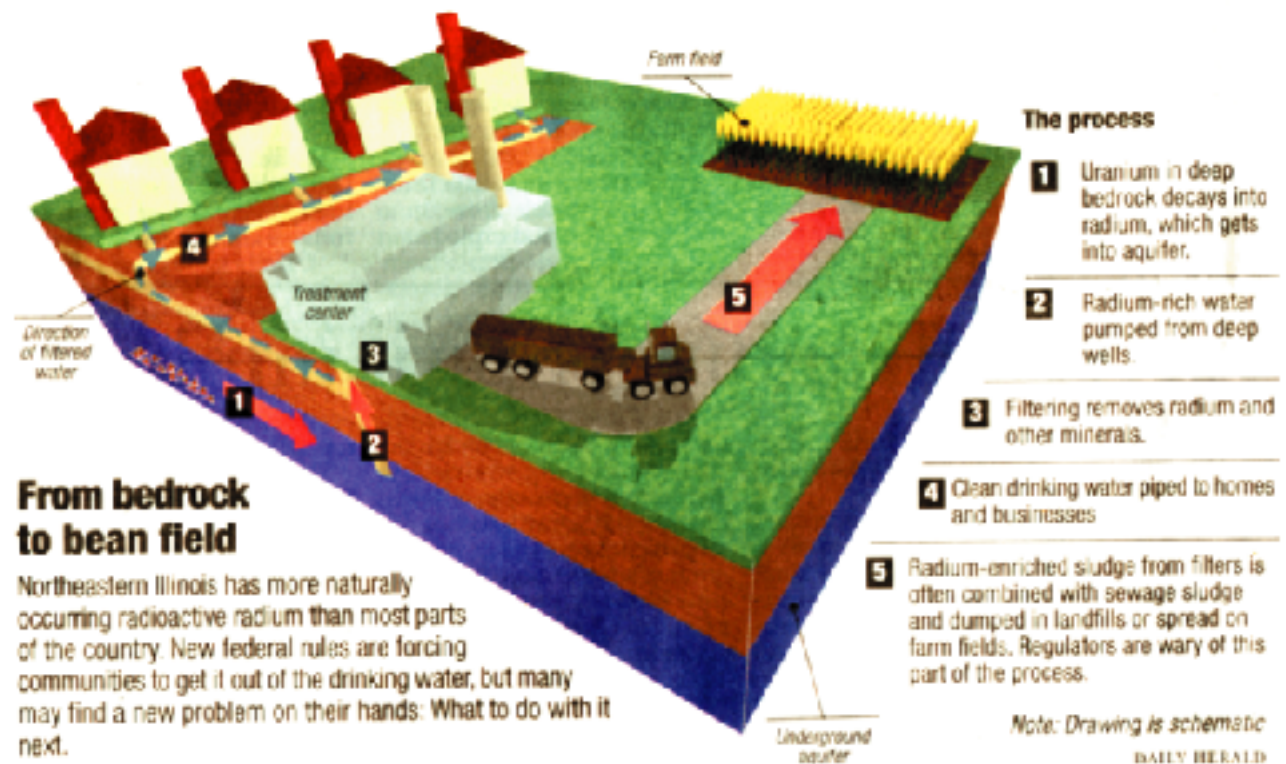
Such clumps, which can contain significantly higher concentrations of radium than anything occurring naturally, can lodge in sewer pipes. That creates a potential hazard for sewer workers, few of whom have the training or equipment to handle “hot” materials.

The sludge next winds up at a sewage treatment plant, potentially exposing a new group of workers, Allen says. While radium-enriched sludge hardly approaches the lethality of high-level radioactive waste from nuclear reactors, it can’t be taken lightly.

“It’s something that needs to be addressed,” Allen says.

Radioactive fertilizer

The next step in the process might create even more concern.



Many towns plan to mix the radium-rich sludge with regular sewage sludge and send it to local farmers, who'll spread it on corn and bean fields.

Nitrogen-rich sewage has been used as fertilizer for years, and that process has had its critics. Add in the radioactive element, and nuclear safety regulations kick in, even though the scientific community hasn't weighed in conclusively.

New Jersey has banned the process. And, according to EPA documents, Wisconsin has expressed "concern" that, for example, building a home on a former field fertilized with radium-concentrated sludge could pose several problems, including high accumulations of radon gas. Radium turns into radon, which evaporates into a hazardous gas.

Other problems might arise from the radioactive waste seeping into surface water or contaminating the crops themselves, potentially sickening those who eat them.

Some environmentalists say those risks aren't worth taking.

"When it stays down in the (aquifers), it doesn't really affect us, but once it gets liberated, it's a problem," says Diane D'Arrigo, radioactive waste project director for the Washington, D.C.-based Nuclear Information and Research Service. "The common sense preventative action should be to not allow contaminated sludge to be used on crops."

The Illinois Department of Nuclear Safety regulates sludge disposal, based on the concentration of radium. But it's unclear how its rules will be enforced because until recently, high concentrations of radium were rare. Now the issue is more relevant.

Enforcement unclear

The only way to know for sure if the sludge is safe is to test it. But such testing is sophisticated, and no government agency is currently set up to do it, in part because radioactivity was rarely an issue in sewage sludge.

Who's affected?

The following water supplies are among 95 statewide that have to reduce radium from their drinking water:

- Bartlett
- Lake Zurich
- Fields of Long Grove subdivision
- North Aurora
- Batavia
- Sycamore
- Countryside Manor subdivision in Lake County
- Touhy Mobile Home Park near Des Plaines
- West Chicago

Source: Illinois EPA

And water officials in West Chicago, Geneva, Batavia, Lake Zurich and several residential neighborhoods with their own water supply said they weren't aware there might be any reason to test their sludge - and they weren't sure how they would go about it.

According to the state rules, regulators not only could prohibit a community from dumping the sludge on a field or in a landfill, they also could require that the town pay for the stuff to be hauled to a licensed disposal site. And there are no such sites in Illinois.

"The answer is that there's probably not a good answer to this right now," concludes David English, water superintendent for West Chicago. "We have to do what the regulators tell us. They can't regulate this stuff (out of the water) without giving us somewhere to put it."