SL Environmental Livingston TCP story

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The San Joaquin Valley National Cemetery is an oasis of green in the dry eastern slopes of the Diablo Range.

To the east, it overlooks the San Luis Reservoir, a surprising expanse of blue half the size of San Francisco. To the west, beyond the four lanes of I-5, it overlooks the green-lined squares of the fields the reservoir feeds. Surrounding everything are yellow, dry-grass hills.

The land for the cemetery was donated by a local ranching company in 1989, and it is now the final resting place of some 30,000 veterans. Water is pumped in from the nearby reservoir to keep the golf course-sized cemetery green.

This oasis was where Kathryn Reyes's career in water began.

She was working at the cemetery, 15 miles from where she grew up in Los Banos, when her supervisor asked some of her coworkers to get water certifications. She asked if she could take the test as well, passed, and, later, began working on water full-time, first just down the hill from the cemetery and then for a town on the other side of the valley.

It was there, in the town of Livingston, that Reyes became the face of an effort to reverse decades of drinking water pollution that had exposed residents to hundreds of times the safe levels of cancer-causing chemicals. It began just a few years after she first considered a career in water, but the effort would lay the groundwork for dozens of similar fights throughout the valley.

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Just after it crosses the Merced River, southbound highway 99 bends slightly to the right to go around a truck-accessory wholesaler and a fertilizer-spreader manufacturer. Then it curves back and passes by the sprawling headquarters of Foster Farms at the northwestern end of Livingston, a town of 13,000 surrounded by the greens and browns of fields and orchards. Less than a mile later, it passes out of Livingston again on its way to Merced, Fresno, and, eventually, Bakersfield.

Those squares of green and brown are filled with grapes, almonds, a dairy and other crops. But mostly they're growing sweet potatoes.

The fields around Livingston produce ninety percent of the sweet potatoes grown west of the Rockies. The light, sandy soil in this part of the Central Valley is perfect for them, earning the town the nickname "sweet potato capital of California."

It's also perfect for nematodes, microscopic roundworms that mar sweet potato flesh with deep, black gashes that make them unsellable. To fight the parasites, farmers routinely apply soil fumigants before planting sweet potatoes, making the area, in the words of a defense attorney, "the soil fumigant capital of the world."

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Long before defense attorneys were studying soil fumigant concentrations, Shell Oil Company and the Dow Chemical Company had created a product to solve farmers' problems with nematodes and keep sweet potatoes on store shelves.

Starting in the 1950s, Shell started selling a fumigant called D-D and Dow one called Telone to farmers around Livingston and throughout California. Sweet potatoes are an annual crop that requires replanting each year, and over the next three decades the fumigants were applied thousands of times to the fields surrounding the town.

When fumigants are applied to soil, they form gases that kill the nematodes and whatever else is in the soil. In the fumigants Shell and Dow sold, the thing that killed the nematodes and whatever else was a substance called 1,3-dichloropropene, which breaks down in the soil into harmless byproducts over the course of several days .

In the course of making fumigants, however, other substances are produced which can be refined out, and either disposed of or used for other products, or left in the final product as inactive ingredients. That was the case with both Shell's and Dow's fumigants.

In the course of making D-D and Telone, a substance called 1, 2, 3-trichloropropane, or TCP, was produced. To refine out the TCP — an inactive chemical useless in the fight against nematodes — from the fumigant and dispose of it would have cost money. So the companies left it in.

Unlike toxic but readily broken down chemicals like 1,3-dichloropropene, TCP doesn't easily break down in the soil. It also doesn't adhere to soil particles, meaning it can seep down into aquifers, where groundwater accumulates.

A Shell D-D fumigant label from the 1970s warned farmers to wear goggles and gloves and wash with soap and water after handling the product. "To protect fish and wildlife," it continued. "Do not spill or empty containers, or rinse equipment or containers, into streams, ponds or other bodies of water."

But waters are connected. Streams, ponds and other surface waters replenish groundwater, and groundwater seeps up into surface waters. Today, TCP is found in groundwater throughout California but particularly in counties like Fresno, Kern, Merced and Tulare in the San Joaquin Valley, where city budgets are tight and residents rely on groundwater for their drinking water.

Livingston is in Merced County, and the concentrations of TCP in its groundwater were exceptional.

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Reyes didn't know what TCP was until she started working in Livingston in 2005.

By that time, in response to growing questions from regulators in the 1980s, Dow had begun to remove the TCP from its fumigant and Shell had exited the agricultural chemical business altogether.

But, decades later, the TCP remained.

The year before Reyes got to Livingston, California had told the city it had to test for the chemical in its wells. Based on the results of those tests, the state recommended Livingston remove three of its eight wells from service due to extremely high contaminant levels. But, without them, the city wouldn't be able to meet the water needs of residents.

Over the preceding decades, a number of studies had linked TCP exposure to multiple types of cancer in animals, including liver and stomach cancer.

So in 2005, California — where a huge agriculture industry had meant that fumigant use, and thus TCP exposure, was particularly high — set a non-mandatory "public health goal" for TCP of 0.7 parts per trillion. That is, as long as the TCP in the water you drink over your lifetime is less than 0.7 parts per trillion, it should pose no significant health risks.

But in tests of Livingston's eight wells performed between 2006 and 2010, the well with the lowest average concentration of TCP in the water, which comes from groundwater, had an average of 21 parts per trillion. The well with the highest had an average concentration of 770 ppt — 1,000 times what the state had deemed safe.

Today, Reyes is public works director in Gustine, back across the valley by I-5, the national cemetery and the reservoir. But she hears the news from Livingston.

"It's amazing how many people have cancer," she says — hundreds of people within her circle.

"It's crazy. You meet someone — 'Yeah I have prostate cancer, my wife has breast cancer,' " she says. "I know someone with a new grandbaby, and they won't even bathe the baby in the water."

Twelve years ago, shortly after starting work in Livingston, she tried to do what she could to help — get the TCP out of the water. The trouble was, the city couldn't pay for it. And it didn't seem right to pass the costs on to ratepayers, the people who were already drinking hundreds of times the safe limit of carcinogenic chemicals.

Livingston wasn't the only community facing this challenge.

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Pineapple cultivation began in earnest on Maui in the 1890s and exploded over the next several decades until, by 1930, nearly a third of the island's land was covered by pineapple plantations.

After World War II, there were fewer pineapple fields, but technical innovations made the ones that remained even more productive. One of those innovations was soil fumigation, which by killing nematodes and helping eliminate root knot allowed farmers to get a second or third crop from a single "mother" plant.

One of those new fumigants was the same Shell product, D-D, that was being sold in California.

It was touted as having "great potential usefulness … in a great many agricultural areas" in a 1943 paper in the journal Science. In that same paper, after expanding on the promising success of the fumigant in field tests, the author notes that "in these tests, the crude form of the mixture was used."

"This crude form contains some impurities," he continues, "but its manufacture involves fewer processes and it is therefore cheaper."

Between the 1950s and 1980s, pineapple growers on Maui applied both Shell and Dow fumigants — and their "impurities" — to their fields. Over that same time, the pineapple industry gradually contracted and its land was largely put to use in a new industry: tourism.

But, as in Livingston, the TCP remained behind, including in three wells that provide water for the resorts and condos of the Kaanapali area.

Hawaii was the first state to set a legal limit for the amount of TCP in drinking water — 800 parts per trillion, set in 1985, which was lowered to 600 parts per trillion in 2001.

The Kaanapali wells had levels of …

In 2004, the Hawaii Water Service Co., which serviced the Kaanapali area, filed suit against Shell, Dow, fumigant distributors and the pineapple-turned-real estate giant Maui Land & Pineapple Co to get the firms to pay for the treatment to remove the TCP from its drinking water (*Hawaii Water Service Company, Inc. v. The Dow Chemical Company, et al.*).

They reached a multi-million dollar settlement before the case went to trial.

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The water utility was represented in the case by SL Environmental Law Group, a San Francisco-based firm that represents public sector clients in environmental contamination litigation.

The law firm knew the contamination extended beyond the Hawaiian island.

California's State Water Resources Control Board keeps a public database of tests for chemicals in drinking water, so the firm started looking for more communities struggling with the legacy of TCP. A handful of towns in the Central Valley stood out.

In 2005, SL Environmental Law filed suit on behalf of Livingston against Shell and Dow seeking damages to fund the city's installation of treatment equipment on its wells.

Just after the suit was filed, Kathryn Reyes came to Livingston, first as its water supervisor and then, after the public works director was fired, as its public works director. Soon after that, the city manager left as well.

Suddenly, she says, "everyone who knew everything about the case was gone."

The acting city manager asked her if she could be the "person most knowledgeable" for the case, essentially the designated representative of the city as a whole.

"Basically," she says. "I got the 12 binders that had been gathered on the case, took them home and, for two weeks, spent half my day reviewing them, in addition to my normal job."

Those binders laid out a case that stretched back to the 1940s, accusing Shell and Dow of being responsible for decades of TCP contamination that severely damaged the city's water supply and its ability to meet state standards in providing safe drinking water to its residents.

The case boiled down to whether D-D and Telone had been defective products, and whether those defects caused injury to the city.

The evidence for both was strong.

Under California law, a product has a defect if it fails to perform safely when used in its intended way, and a manufacturer, distributor or retailer is liable if that defect causes injury in the course of that intended use. In depositions, Livingston-area farmers said they didn't expect that by using the fumigants in their intended way they would be contaminating groundwater.

For some products, the case can be made that the risk of negative effects from that defect is outweighed by the benefits of the product. But, in this case, the benefits of the fumigant to the farmers would have been just as strong with or without the defect, TCP. The only benefit of including the impurity was lower manufacturing costs.

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As early as 1959, Dow knew the TCP did not add to Telone's insecticidal benefits, according to internal documents, which also showed the company was long capable of reducing the impurities to low concentrations with essentially the same equipment it was already using.

Eventually, in fact, it did. As Hawaii and California began to move toward regulating TCP, Dow developed a TCP-free Telone II, removing the impurity with a distillation process it had been capable of implementing decades earlier.

Over at Shell, a 1940s study had shown pure TCP was 14 percent as effective at killing nematodes as the D-D as a whole, of which TCP made up about 1 percent. That is, TCP contributed less than two-tenths of one percent to the overall insecticidal benefits of the fumigant.

They did find it made a difference in other ways, though. By 1952, Shell knew tobacco plants grown in D-D-treated soil had low concentrations of TCP in their leaves. The company told regulators there was no evidence that D-D added any contaminants to crops, but, even more problematic, the finding suggested TCP remained in the soil long after D-D had been applied prior to planting.

That suggestion was backed up a decade later, when a study showed D-D can leach into groundwater. Over the next five years, that "can" became an "is" as Shell began receiving reports of well-water contamination from D-D in California and elsewhere.

It kept the reports to itself. That coverup included both ignoring requests for information from regulators and, in both the case of Shell and Dow, labeling products they knew to contain inactive impurities as "100% active."

In the 1970s, an internal study also concluded the risk to groundwater was real and recommended removing TCP from the fumigant. Shell designed a distillation process to remove it and other impurities. But by now it had a price advantage over Dow and, in order to avoid the disposal costs, it decided not to implement it.

Eventually, in the mid-1980s, with new regulations solidifying, Shell took D-D off the shelves and exited the fumigant market.

The city of Livingston claimed this history of misleading labelling, withholding information on adverse impacts, failing consumers' expectations and selling a product whose risks outweighed its utility — and the tests showing extreme concentrations of TCP in the city's wells — was enough to establish the companies' liability.

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The companies saw things differently.

In their view, their products allowed Livingston to flourish. The town depended on sweet potatoes and other crops that, in turn, depend on fumigants to reduce nematodes in the soil.

The trouble was, the TCP at issue did nothing to reduce those nematodes. A 100%-active fumigant product might have been worth the risks despite some environmental damage, but, in this case, the risks from the specific design of these products outweighed the benefits of that design.

They also saw the issue as too old to litigate, a couple decades after they stopped selling fumigants containing TCP. But that statute of limitations clock wouldn't begin until the city knew there was a problem — in this case, that day in February 2004 Livingston city hall got the notification from the state telling Livingston it had to test for TCP, the day most people in Livingston first learned what TCP was.

The companies also felt there was a case to be made that the city didn't really care about the contamination since it hadn't taken action earlier after that 2004 notification.

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That's the argument that really bugged Reyes.

By 2011, when she was deposed to answer questions from the companies' lawyers, she had known what TCP was for six years. The city had known it was a problem in their wells for seven. But -Shell had known it posed a potential problem for groundwater supplies for at least three decades.

"It was really horrible because they were trying to make me, the city, look bad," she says. "We want to remove everything, but the key was they were the ones who put it there. It wasn't naturally occurring."

In her deposition, she told the attorneys: "We have a standing order that now is seven years old that recommends us removing three of our producing wells offline because of the high levels of 1,2,3-TCP. And, as a water system operator, that concerns me. … I'm serving contaminated groundwater to people in my community."

She continued: "We are going to get into the, you know, all these little technical things to try to not have the proper people that contaminated the groundwater pay to remove it. It should be something, as a

responsible company, that they would want to do for our community. Like I would want to do for my community if I had the funds.

“We have no funds. We are a poor community. And if I shut the wells off, every single well, where is my community going to move to? That's my source of water.”

A few months, later the companies settled with Livingston for millions of dollars.

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It was less than the more than $20 million in damages the city felt it was owed and that it needed to fully clean up the contamination, but it was enough to begin the cleanup.

Livingston has put a treatment system on one of the wells in the years since. It’s a start.

Reyes warns other cities against settling for a smaller-than-needed amount. “It’s very, very, very expensive to treat for TCP,” she says.

But she also thinks that if Livingston’s case had been filed today it might have gotten more, due to new regulations that provide clearer direction.

In March, California proposed a “maximum contaminant level” for TCP, which would bump the regulations up from a non-mandatory “public health goal” to an enforceable standard. It set the maximum amount of TCP allowed in drinking water at 5 parts per trillion, the minimum level current technologies can detect. If a drinking water source exceeds that MCL, water utilities would be compelled to treat the affected water.

Since Livingston, a slew of similar cases have been filed, and the impending MCL may have opened the window for litigation by communities suffering from much less extreme contamination than Livingston. In April, for example, Soquel Creek Water District in Santa Cruz County sued Dow and Shell over contamination in a well that has seen TCP levels as high as 15 parts per trillion — three times new MCL but a small fraction of that of Livingston’s wells.

The firm that represented Livingston, SL Environmental, has filed suit on behalf of X clients.

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Reyes says her experience in the case didn’t really change how she looks at water. “But one of the first things I did when I got to Gustine was test for TCP,” she says of her new job down the road.

She also notes that she lives on a property with a private well, in Stevenson, exactly between Livingston and Gustine — “but we don’t consume it because the arsenic levels are too high.”

“I drink bottled water,” she says.