

## Threats to the Southern Hills Aquifer System Grow in Louisiana

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A ten-parish area from greater Baton Rouge to St. Tammany Parish gets its drinking water from the Southern Hills Aquifer system -- a number of interdependent units that start to the north in Mississippi. Over half a century of efforts to protect the aquifer from industry have yielded results but more needs to be done. Fracking in the Tuscaloosa Marine Shale play in Southeast Louisiana is one threat. New Orleans-based Helis Oil & Gas wants to drill down through the aquifer near Mandeville, La. this summer. A bigger menace, however, is salt's entry into the system as water demand swells in Baton Rouge.

Meanwhile, New Orleans uses some groundwater for industry, including power generation, from the Gonzales-New Orleans aquifer. But the Crescent City relies on the Mississippi River for drinking water.

Salinity has increased in the Southern Hills Aquifer system because of water needs in and around Baton Rouge. "Both industry and public supply users, such as the Baton Rouge Water Company, are drawing saline water north across the Baton Rouge fault from the south towards a demand center -- a cluster of industries north of downtown Baton Rouge," geologist and hydrologist Douglas Carlson, an assistant professor of research at Louisiana State University, said last week. "Public supply wells tend to be spread out in East Baton Rouge Parish, and their demand is more diffuse than industries concentrated north of downtown Baton Rouge."

Considerable salt water intrusion has occurred north of the Baton Rouge fault. "This fault lies roughly along I-10 through East Baton Rouge Parish," Carlson said. Salt water threatens a major drinking water source, the Lula Pumping Station, near the intersection of Choctaw Dr. and No. Acadian Thruway.

Water use in East Baton Rouge Parish expanded 50 percent from 1960 to 2010. Based on a number of studies, industry's water demand in the parish fell to 44 percent of total usage in 2010 from 78 percent in 1960, while public supply use grew to 50 percent from 20 percent in 1960, Carlson said. Greater Baton Rouge's population has increased, especially since Hurricane Katrina in 2005.

Paper producers account for about half of industry's withdrawals of aquifer water in East Baton Rouge Parish, Carlson said. One third of industrial demand is from chemical companies, and one sixth is from petroleum refineries. That pattern is little changed from 25 years ago, he noted. Municipal drinking water in the parish is mostly from the 1,500-foot sands, while industrial users, including Georgia-Pacific and ExxonMobil, draw from the 1,700- to 2,400-foot sands. Foot-sands refer to depths below the ground's surface.

The Capital Area Ground Water Conservation Commission -- a five-parish management district created by the state legislature -- set limits on water used by industry from 2,000-foot sands in 1991 and reduced those caps last September, CAGWCC director Anthony Duplechin said last week. In September, the commission also placed some limits on 1,500-foot sands reserved for public supply users. Caps on industry and public supply users are higher than current water withdrawals, however.

In November, state Commissioner of Conservation James Welsh sent a letter to CAGWCC recommending that it develop a plan with specific steps and goals to address saltwater intrusion. The Office of Conservation, he said, is ready to assist and provide guidance.

State Representative "Ted" James II, D-Baton Rouge, drew up a bill this spring that would have limited industrial usage from the aquifer in Baton Rouge over the next six years. "The bill didn't get out of committee," Hays Town Jr., founder of Baton Rouge Citizens to Save Our Water, Inc., said last week. "Industry is too strong in the legislature." Groups and commissions have studied the area's salt water intrusion for years but citizens need to take an interest and exert pressure on legislators to protect the aquifer, Town said.

Meanwhile, at ExxonMobil's Baton Rouge refinery and chemical plant, dependence on groundwater has declined and about half the water used now is from the Mississippi River, spokeswoman Lana Venable said last week. "We built our clarified river water unit in 1971, and over the years upgraded it to treat more river water," she said. "We converted six cooling towers from groundwater to river water in the last seven years." The company plans to continue expanding its river water usage, she said.

In 2012, ExxonMobil Baton Rouge submitted a 2013-14 groundwater reduction plan of 1.6 million gallons a day to the state's Department of Natural Resources and expects to meet that goal by next year's end. "Our reductions in use from the 2,000-foot aquifer will come from using clarified river water, and some of it will come from using alternative aquifers," Venable said.

As a member of the CAGWCC, ExxonMobil is committed to using sound science to develop effective, long-term strategies to protect groundwater, she said. For the 2,000-foot aquifer, the company supports construction of scavenger wells, which capture salt seeping toward nearby production wells. Venable said studies by the U.S. Geological Survey and others using computer models have shown that the best approach by all users to managing the 2,000-foot aquifer is a combination of scavenger wells and less fresh water pumping.

At Georgia-Pacific's Port Hudson facility in East Baton Rouge Parish, spokeswoman Patty Prats-Swanson said paper production is water intensive. "It's 99 percent water," she said. "To make paper towels and bathroom tissue, we need good clean water." Nonetheless, the Port Hudson facility has cut its ground water use by 20 percent in the last two decades.

Georgia-Pacific gets a third of its water from the very shallow part of the aquifer system that doesn't contribute to the region's drinking water, Prats-Swanson said. That water is lower in quality and must be processed before the company uses it. Another third of the ground water utilized at Port Hudson is from 2,800-foot sands, which aren't considered by hydrologists to be under stress.

"We continually evaluate reduction, reuse and recycling projects that will help in conservation," Prats-Swanson said. Water that's sprayed on piles of logs so they don't dry out is from shallow wells, and it's collected and reused.

Increased fracking in the Tuscaloosa Marine Shale play in recent years has raised concerns about aquifer contamination and additional water demand. In two presentations last year, one in April and another in September, Commissioner of Conservation Welsh said the state encourages frackers to use surface rather than ground water

Frackers typically require 3 million to 10 million gallons of water per well, LSU's Carlson said. Hypothetically, if a thousand wells were developed in the TMS and they all depended on the Southern Hills Aquifer, 3 to 10 billion gallons of ground water would be used, he said. In comparison, the Baton Rouge Water Company alone withdrew 20 billion gallons a year from the aquifer in 2010, he noted.

Helis Oil & Gas, which plans to drill in St. Tammany this summer, says it won't rely on the Southern Hills Aquifer. "All water for the project will be obtained off premises from surface water ponds or commercial sources," the company said in a public statement earlier this month. "We will not be using water from the local aquifer in any way." Helis last week didn't respond to a phone inquiry about its water plans.

Last week, St. Tammany President Pat Brister said Helis will drill down 13,000 feet for data and samples and will analyze its findings over three to four months. If commercially viable quantities of oil are found, Helis will conduct horizontal drilling and will frack to extract oil.

At Canada-based Encana Corp., which operates 18 producing wells in the Tuscaloosa Marine Shale play -- including three in Louisiana and 15 in southwest Mississippi, the company relies on the Amite River and its East and West forks, along with private surface water ponds for water. "In addition, Encana drills groundwater wells to provide the water needed for drilling," Encana Services Co. spokesman Doug Hock in Colorado said last week. "These are typically only 100 to 250 feet in depth," and above Southern Hills Aquifer sands, generally starting 400 feet or more below ground, he said.

"Encana would typically never use a groundwater source that was an area's primary source of drinking water for our needs," Hock said. And produced water or waste water from Encana's TMS wells is disposed of in state-licensed, deep injection wells, under rules set by the U.S. Environmental Protection Agency, he said. The injection wells can be, but aren't necessarily, near drill sites.

When asked whether Encana is considering fracking in St. Tammany Parish, Hock said the company's efforts are focused on Mississippi now. "Amite County is where we have the majority of our activity," he said.

At Houston-based Goodrich Petroleum Corp., which has wells producing in the TMS play, the company generally uses surface water from private lakes, streams or ponds, spokeswoman Kristie Buchanan said last week.

Fracking companies claim that drilling, when done properly, is no threat to drinking water. But in late 2011, the EPA said fluids used to drill for natural gas most likely polluted an aquifer near Pavillion, Wyoming. Encana, which owns the oil and gas wells in question there, disagreed with those findings, and said the chemical compounds were naturally occurring. The state of Wyoming is investigating the matter and plans to issue a report by late September.