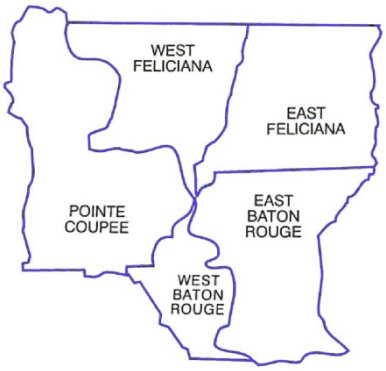

Capital Area Ground Water Conservation District

Watching out for A Treasured Earth Resource

Dedicated to the conservation, orderly development and protection of quality of ground water in the Capital Area

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Capital Area Groundwater Conservation Commission Moving Ahead with Saltwater Intrusion Solutions

BATON ROUGE – The Capital Area Groundwater Conservation Commission (CAGWCC) met on Tuesday, August 6, 2013, to formally receive the USGS modeling report titled "Simulation of Groundwater Flow in the "1,500-Foot" Sand and "2,000-Foot" Sand and Movement of Saltwater in the "2,000-Foot" Sand of the Baton Rouge Area, Louisiana." This open-file report is the result of a five-year cooperative agreement between CAGWCC, USGS, the Louisiana Department of Transportation and Development and East Baton Rouge Parish/City of Baton Rouge.

The model simulates groundwater flow in the two primary sections of Baton Rouge's aquifer system, the "1,500-foot" and "2,000-foot" sands, and also shows saltwater movement in the "2,000-foot" sands.

Saltwater is encroaching northward in the "2,000-Foot" Sand toward the Baton Rouge industrial district north of the state Capitol. The model simulates the historical movement of the saltwater, which can be used to predict future movement.

The model looks 40-year into the future through a series of "what-if" scenarios simulating future groundwater levels and salt concentrations that might occur if pumping in the Baton Rouge industrial district continues at current rates, is reduced by about 20 percent or stops completely.

Also simulated was the possible use of "scavenger wells" to intercept the saltwater. Scavenger wells located between the fault and the industrial district could slow northward encroachment of the saltwater.

The Commission formed a sub-committee to develop a remedial plan for the "2,000-foot" sand, and to develop a series of standard practices for aquifer management.

Upcoming Meetings

The Technical Committee will meet on Tuesday, September 10, at 1:30 p.m. in conference room of the U.S. Geological Survey, 3535 South Sherwood Forest Boulevard, Baton Rouge, Louisiana. The regular meeting of the Board of Commissioners will be held at 9:30 a.m., Tuesday, September 17, 2013 in the same location. The Administrative Committee will meet at 8:30 a.m. in the District conference room, Suite 137, 3535 South Sherwood Forest Boulevard.

Recent Meetings

Technical Committee

The Technical Committee met on Tuesday, June 11, in the U.S. Geological Survey conference room at 3535 S. Sherwood Forest Blvd., Baton Rouge, Louisiana. A second meeting was held on Tuesday, August 6, 2013, to discuss the "Simulation of Groundwater Flow in the "1,500-Foot" Sand and "2,000-Foot" Sand and Movement of Saltwater in the "2,000-Foot" Sand of the Baton Rouge Area, Louisiana."

Commission Meeting

The Capital Area Ground Water Conservation Commission met at 9:30 a.m. on June 18, 2013 in the U.S. Geological Survey conference room at 3535 S. Sherwood Forest Blvd., Baton Rouge, Louisiana. The meeting was called to order by the Chairman, Mr. Joey Hebert.

The following Commissioners were present: Trey Argrave, Dale Aucoin, Brian Chustz, Johan Forsman, Joey Hebert, Barry Hugghins, John Jennings, Amelia Kent, Dennis McGehee, Julius Metz, Mark Walton and Dr. John Westra.

Others attending the meeting were: Tony Duplechin and Shawn Scallan, Capital Area Ground Water Conservation District; Jason Griffith, U.S. Geological Survey; Megan Terrell, Louisiana Office of the Attorney General; Amy Wold, The Advocate; Henry Graham, Louisiana Chemical Association; Bryan Harmon, East Baton Rouge, Dept. of Public Works; Matthew Reonas, Louisiana Department of Natural Resources; and Luci Silva, Brown and Caldwell.

The Administrative Committee met in the Capital Area conference room earlier in the morning.

Work on Baton Rouge Water Company Scavenger Well Project Progressing

If you don't have good water, it doesn't matter what other resources you have. Securing a good public water supply is one of the most basic but most important concerns for any town. Like many municipalities, Baton Rouge, La., has found its water supply stressed to its limits by population growth and city expansion. Some creative thinking about drilling a new well was a key component in addressing those limits.

Bruce Duhe has worked for Layne Christensen for over 25 years, but he says that building a "scavenger" well to shore up the well near Lula Avenue in Baton Rouge is the most challenging project of his career to date.

A scavenger well placed between a contaminant and a production well can protect and prolong the life of the production well. Engineers balance the withdrawals from the scavenger well and the production well, optimizing the available freshwater. In this case, the scavenger counters the pull of saltwater toward the production well and ensures the drinking water stays drinkable.

The Baton Rouge Water Company, or BWRC, is an investor-owned utility that began in 1888. "Baton Rouge has a wonderful water supply," said Hays Owen, senior vice president and chief administrative officer for BRWC. "The water here is very soft because it goes through natural rock." Unlike other municipal water supplies in the region, BRWC obtains their water north of Baton Rouge, rather than from the Mississippi River. The water is known for its great taste, probably thanks in large part to its source from the Southern Hills Aquifer.

Surface expression of the Baton Rouge Fault along College Drive.

However, some people noticed saltwater intrusion as early as the 1930s. It wasn't recognized as a problem until the 1960s, when Department of Public Works officials discovered saltwater encroaching in the 1500-foot sand aquifer that supplies east Baton Rouge. The saltwater intrusion is due to a natural fault line that runs through Baton Rouge. This saltwater intrusion has become an increasingly significant problem because it's having an impact on the water supply, so the utility company finally created a way to repair the well.

"The purpose of the project was to address the saltwater front," said Bruce Duhe, district manager of water resources for Layne Christensen, the contracting company for the project. "Other models projected the saltwater front advancing north over a period of five to 10 years, but we found out from our observations that it was actually advancing much faster." Increased population and rapid industrial growth accelerated the saltwater intrusion.

Excess salt in drinking water doesn't just taste bad. It also contributes to total sodium intake, which is linked to conditions like heart disease. It also makes water more corrosive, which leaches metal particles from pipes into the water. It was essential for many reasons to fix the imbalance. The chlorides present in the drinking water exceeded the EPA standard of 250 parts per million as of 1980; by 1990 it was already 3,300 ppm. What's worse, other wells in the Baton Rouge area aren't far behind.

The pump station is along North Street and 31st Street in Baton Rouge, generally referred to as the Lula Station. The fault line divided the aquifer into two parts. North of the fault line was the supply of great drinking water; saltwater lay south of the fault line.

"The groundwater level north of the Baton Rouge fault is higher than the water level south of the Baton Rouge fault, so there's a south water flow," said Frank Tsai, a water resources and coastal engineering specialist at Louisiana State University.

As freshwater is pumped out of the north, the saltwater comes rushing in from the south.

"Pumping north of the Baton Rouge fault created a pressure difference, so the groundwater level in the north area is much lower than the level in the south area," he said.

The company had an idea about the best way to proceed based on an observation well just north of Baton Rouge. Layne Hydro put chief modeler Vic Kelson, Ph.D, to work to figure out how to solve the problem. Layne ran an electric log to see how much saltwater was intruding, and it turned out that it was an unacceptably large amount.

Kelson and Layne Hydro decided that the best approach was to create a scavenger well system. The well couple would have one pull the fresher water from the surface of the water, while the other would pull the salt from the bottom. Rhett Moore, Layne Hydro's senior hydrologist who worked on the project, couldn't find any other examples of this technology being used in the United States.

Keeping the saltwater separate from the freshwater was crucial. Fortunately, because saltwater is heavier, it tended to sink to the bottom and remain stratified. The separate layers made it possible to remove the salt.

"Currently, the saltwater wedge extends all the way to the Lula Station. The lower well will capture saltwater on its way north toward the Lula Station. Over time, the saltwater wedge between the Lula Station and the well couple will be "flushed out," Moore said.

"The great part about the design was that it actually gets more efficient over time. It [the scavenger well] pulls the denser salt while the production well replaces it with freshwater," Duhe said. The coupler is expected to be very cost effective in preserving the Lula Station.

The scavenger well was made with very heavy construction. "All of it was 3⁄16 low-carbon stainless steel, built to withstand lots of chloride," Duhe said. The higher-chloride water extracted by the well is destined for the Mississippi River. The water has lower salinity than ocean water, but is still too salty to drink.

It's expected that the well will be able to capture 75 to 90 percent of the salt, but engineers will continually monitor the effectiveness as it's implemented. "We will have to tweak the variables," Duhe said. "Right now, there's a combination of 700 gallons per minute between the two wells, a total of about one million gallons a day. That's just a huge amount that we're dealing with."

Finding property for the well project was also a challenge. The company bought a property along 31st and 32nd streets for the scavenger well, and Layne was on site a month after closing on the property. The first well needed to be complete before construction of the second well could begin.

Layne Christensen is known for its drilling expertise, not just because it's one of the oldest drilling companies in the United States. Crews from Layne also worked to successfully free the 33 miners who were trapped in Chile in 2010. Layne's crews had the drilling experience needed to drill holes large enough for the rescue operation.

At the Lula site, drilling work is done by a double rig with a three-man crew, consisting of a lead driller, derrick and floor hand. "It's not our biggest rig, but it definitely gets the job done," Duhe said.

The mud pump being used for the project is a Mattco 7.5-inch-by-14-inch with D-500 gear.

By all accounts, the project is going well so far. The worst part of the project was identifying the extent of the problem and figuring out how to solve it. "It's still early in the process, and I feel like knocking on wood when I say this, but so far, so good," Duhe said.

"We hope that the project will keep the saltwater at bay and preserve the aquifers for years to come," Hays said. If all continues to go well, the company may move on to restoring other wells in the Baton Rouge area next.

National Driller – September, 2013

Capital Area to Assist Sparta District in Educational Outreach

District Director Tony Duplechin has been asked by the Sparta Groundwater Conservation District to once again participate in their WaterFest educational program

The WaterFest, which is sponsored by The Sparta Foundation, will be held at Lincoln Parish Park, just north of Ruston.

The main focus is to teach the students the importance of water conservation as professional presenters from LDEQ, LSU Ag Extension Service, Capital Area Groundwater District, U.S. Forest Services, United States Department of Agriculture, NRCS and Louisiana Department of Agriculture and Forestry teach the students at six interactive stations.

The six stations include Long Haul, It's Alive, Pass the Jug, Sparta Aquifer, Amazing Water and How Much Do You Use?

During the long haul, for example, students collect water from the lake to fill a 95 gallon garbage can, teaching the students the amount of water that one person uses daily.

Mr. Duplechin will teach the students about the Sparta Aquifer, which is the major source of groundwater for all or part of sixteen parishes in North Central Louisiana

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A CHARITY DEDICATED TO THE PRESERVATION OF THE SPARTA AQUIFER
• CONSERVATION • EDUCATION • PRESERVATION • RECOVERY

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