

THE CHEMICAL CORRIDOR

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Gary Phillip
Stan Coley
Kay Haska

Jack Lippman
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Kay Gaudet, left, became concerned when sister Peggy Hoffman and nine other women she knew had miscarriages.

Jobs and Illness in Petrochemical Corridor

In Louisiana, Pollution Is Familiar but Pattern of Disease Is New

By David Maraniss and Michael Weisskopf
Washington Post Staff Writers

ST. GABRIEL, La.—Kay Gaudet, the village pharmacist, started keeping her list one year ago. The first name on it was Peggy, her younger sister. The next nine were friends and neighbors. All had been pregnant about the same time, but there were no babies to show for it, only the private agony of miscarriage. Gaudet was concerned and curious. Was it coincidence? How many other women in St. Gabriel, population 2,100, had suffered similar fates? Gaudet spread the word at her drug store, at the Catholic church where she prayed each day and up and down the oak-lined river roads.

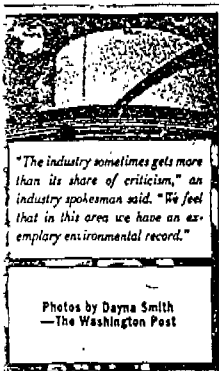
Anyone who's had a miscarriage, tell Kay.
Week by week, the list grew: Alice, Angie, Belin-

da, Charlotte, Dayna, Dell, Elizabeth, Emma, Irma, Karen, Matlin, Pam, Rhonda, Sandy, Sherri, Tammy, Terri, Tina, Tyra, Vera.

Today, the names total 63.

St. Gabriel lies along an 85-mile industrial corridor where about one-fifth of America's petrochemicals are produced. It begins in Baton Rouge, with the giant tinkertoy maze of pipes, stacks and cat-crackers in the shadows of Huey Long's skyscraper capitol building, and follows the Mississippi River down to the southeastern rim of New Orleans. The air, ground and water along this corridor are so full of carcinogens, mutagens and embryotoxins that an environmental health specialist defined living here as "a massive human experiment," the state attorney general called the pollution "a modern form of bar-

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"The industry sometimes gets more than its share of criticism," an industry spokesman said. "We feel that in this area we have an exemplary environmental record."

Photos by Dayna Smith
—The Washington Post

Residents Tally Cancer Cases, Miscarriages

LOUISIANA, From A1
ism," and a chemical union leader nowers to it as "the national sacrifice zone." As it rolls south, the Mississippi is an dless progression of wide loops. Seen on the sky, they resemble colossal ques- on marks—rightside up and upside wn—each quizzical turn lined with pet- chemical plants, refineries and toxic ists dumps, and dotted at bottom or top a town. Question marks loom large in any of these towns, not just in the poetic eep of the river but in the life-and-death nerns of the people.
In Plaquemine, they wonder why Tiger e Gullet and six other people came down h lung, brain or kidney cancer on one all span of Delcros Street. Their parish r county), Iberville, is one of 10 in the utheastern one-third of Louisiana that nk in the top 10 percent of lung-cancer aths nationwide, and while the percent- e of cigarette smokers here is high, pub- health specialists think there might be re to it. Tiger Joe, who died of lung can- r three years ago, never smoked.
In Chalmette, Elia Trapini would like to ow why the street she lives on, Jacobs rive, became known as "Cancer Alley," th 15 cancer victims in two blocks, and y, a half-mile away on Decombe Street, r sister and nephew were among seven net victims on one block.
On Coco Road in Geismar, whose yel- ish-green industrial plume can be seen i miles away, they ask why cats and dogs e lost their hair, why aluminum screens e soon after they are installed and why -age and middle-age men are dying of ine and testicular cancer.
In the old company town of Norco, nat- alist Milton Cambré puzzles over the disappearance of Spanish moss from the live k stands and crawfish from the ponds, dries, marshes and canals.
And in St. Gabriel, they want to know

why there are so many names on Kay Gaudet's list.

Her figures mean that one of every three pregnancies there since 1983 has ended in fetal death, more than double the Louisiana average. As the numbers grew, Gaudet and many others here began to think what was once unthinkable: Perhaps the local chemical plants—18 of them within five miles of town, eight more across the river in Plaquemine—had something to do with it. Nearly 400 million pounds of toxic pollutants are released into the atmosphere here each year, including 306,000 pounds of vinyl chloride, a ingredient of plastic that is a carcinogen and suspected embryotoxin.

"Something Was Very Wrong"

This hypothesis was not easily posed in St. Gabriel. For decades, the town's economic health has been tied to the chemical and petroleum refinery companies lured to Louisiana after World War II, providing half of its manufacturing income. Some husbands of the miscarrying women worked in those plants, which employ one of every five laborers in the state. Gaudet grew up in a company village up at the huge Exxon refinery in Baton Rouge, where her father still operates the pipes. From birth, she was accustomed to the sights and smells of heavy industry.
But to be familiar, she decided, is not to be immune.

"I'm not trying to be a hell-raiser or a goody-goody. I just think we have a situation that needs answering," said Gaudet, 37, whose pharmacy just past the spotlight on Rte. 74 has become a clearinghouse and meeting place.

"When I first started with the list, some people wanted me to say right away that the chemicals were at fault. But I didn't want to say anything that I didn't know to be true. Then last summer, it started to get out of control. When four women miscarried in eight days, I realized that something was very wrong here. I started studying the

chemicals, such as vinyl chloride, and their possible effects, and it just clicked. I had to raise the question, so I did. My mom is always saying to me, 'Kay, shut up, didn't you ever see that Silkwood movie? If you're not worried about yourself, what about your kids?' And I say that's exactly what I'm worried about—my kids."

Gaudet and her husband, Chris, have two healthy little girls. The oldest, Christine, 9, has watched her mother so carefully over the past year that she knows the issues, sometimes pretending she is a television reporter, with imaginary microphone in hand, she asks: Why are all these babies dying?

That question is being explored by the Tulane School of Environmental Health, but officials there do not expect to solve the mystery. A few studies done in the United States, Canada and England show an abnormally high rate of spontaneous abortions and birth defects among women whose husbands work near vinyl-chloride or who live "downwind" from vinyl-chloride polymerization plants.

But as Tulane scientist Lu Ann White told the St. Gabriel women at a meeting in late August: "It's very possible you may never get a definitive answer."

Fred Loy and Richard Kreiner of the Louisiana Chemical Association say the paucity of definitive scientific evidence makes them feel as if they are "batting ghosts" in responding to charges against the industry. Once, when asked about the St. Gabriel situation, Loy said: "Before we can conclude anything, the state has to find out if there is even a problem, how bad it is and what is causing it." They say the chemical plants are causing the miscarriages, but they have no proof. I could say they screw too much and that's the cause of the miscarriages. But then I would have no way to prove that."

"It's human nature to want to blame something, whether it's God or industry or your body," Kreiner said. "The industry sometimes gets more than its share of criticism. We feel that in this area we have an exemplary environmental record.... We have been pretty responsible neighbors."

The chemical corridor was born from a simple rural society in a flat, semitropical wedge of the Mississippi Basin. Vast sugarcane plantations, worked first by slaves, then by tenant farmers, enriched the aristocratic owners of French descent who lived in mansions and enjoyed the society of New Orleans a short steamboat ride away. Enclaves grew up in the shadow of those estates, pockets of poor blacks and Acadians who fished, hunted and trapped in the bayous and settled on streets named for their families.

When World War II sparked an oil and gas boom elsewhere in the state, industry put its refineries along the river with its

shipping lanes. Petrochemicals, made with petroleum provided by refineries and with salt, sulfur and water provided by nature, followed easily.

By the 1970s, the industrial corridor was known as America's Ruhr, producing 60 percent of the nation's vinyl chloride, 60 percent of the nitrogen fertilizers and 28 percent of the state's total. Today, the river is lined with 136 petrochemical plants and seven oil refineries, nearly one for every half mile of the Mississippi.

Jobs, Money and Pollution

The jobs and money they brought to 10 river parishes transformed one of the poorest, slowest-growing sections of Louisiana into communities of brick houses and shopping centers.

But they also brought pollution. The narrow corridor absorbs more toxic substances annually than do most entire states: carcinogens such as benzene, carbon tetrachloride and ethylene dichloride; experimental mutagens or fetal poisons such as toluene, ethylene oxide and chloroform. Coast Guard divers retrieving sediment samples from a bayou in 1978 suffered second-degree burns on their hands.

St. Gabriel, Geismar and Plaquemine alone—10 square miles—can pollute the air with as much as 25 million pounds per year of these chemicals and dump 75 million pounds of industrial wastes into the Mississippi, according to studies. Another 3.5 million tons of toxic debris—more than 1 percent of the nation's total—is buried, dumped in landfills and stored in surface ponds or injected through underground metal pipes deep into the earth.

Toxic fumes from a waste site near the Devil's Swamp section of Baton Rouge caused nausea, headaches and vomiting in workers two blocks away during a cleanup effort last month.

Despite its longterm dilution in the environment, the corridor pollution leaves telltale tracks. In the 1970s, the Environ-

mental Protection Agency found 66 pollutants in New Orleans drinking water and 73 lethal chemicals in the air of Plaquemine. The groundwater of 23 industrial sites, along the river leached with toxic materials, burrowing toward the drinking-water aquifers of communities served by wells.

Motorists driving down the corridor's main highway are reminded in hyperbole of the ultimate chemical disaster. "Bhopal on the Bayou" reads a billboard hoisted by workers on strike from one of the petrochemical plants.

Such a region might be expected to resemble a congested, sooty notch on the Rust Belt. Not the chemical corridor, with its neat neighborhoods and forests of chimney pipes. Pollution registers quietly here—in the oily taste of New Orleans water, which Cajun *commissaires* complain can spoil everything from *bourbon* to red beans and rice; in the blackened leaves of fruit trees, in the hard odor of white particulate laid out from the Murphy Oil Refinery in Chalmette; in the evacuation of the town of Good Hope. For 10 years, residents there, including Charles and Barbara Robichaux, kept their satchels packed to flee monthly fires at a local refinery.

"We always kept our valuables in a safe place where we could grab them at a moment's notice," recalled Charles Robichaux, 54. The 100 families of Good Hope, devised a warning system, knocking at each others' doors to rouse neighbors, often in the middle of the night. They would meet at the Presbyterian church where they kept their cars facing the river—the path of escape.

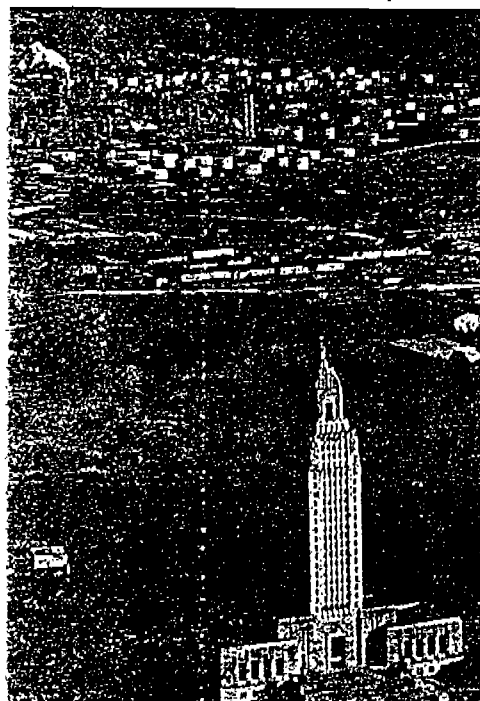
The refinery bought out the Robichaux family and other residents in the early 1980s, and today Good Hope consists of a few abandoned structures and weeds.

From whole communities, the disruption devolves to the individual trauma of Jesse Billings, an asthmatic from Plaquemine, felled from her riding lawn mower last Au-

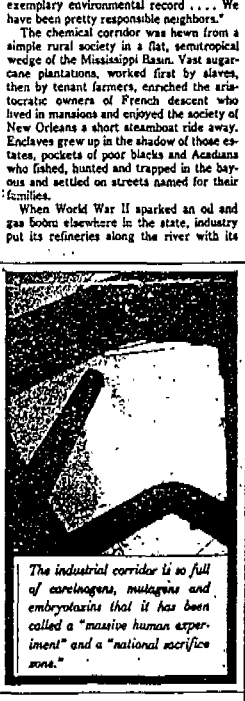
See LOUISIANA, A11, Col. 1



Ruffin McLean, right, sits on Baton Rouge porch with Willie Fontenot. McLean worked at Copolymer Rubber and Chemical Corp. in background, and says the smell and noise are the price of jobs.



Petrochemical plants dot the skyline behind Louisiana's skyscraper state capital in Baton Rouge.



The industrial corridor is so full of carcinogens, mutagens and embryotoxins that it has been called a "massive human experiment" and a "national sacrifice zone."



Warning sign was posted last month in Devil's Swamp, where dead trees indicate pollution levels.

The 1970 Clean Air Act requires the EPA to regulate hazardous air pollutants. The agency has emission standards for seven substances, but they don't include many of the corridor's deadliest chemicals.



Barbara and Charles Bobichaux survey abandoned street where they and their neighbors once lived.

Prosperity, Illness and a Common Thread of Pollution

LOUISIANA, From A18

gled by a bluish cloud of chlorine, which, she said, was released without warning by the Dow Chemical plant 300 yards from her backyard. Hospitalized for three weeks with respiratory ailments, Billings, 60, said, "I respect chlorine just like I respect a gun."

Her thick-skinned defense is *de rigueur* in the chemical corridor, where pollution is woven into life patterns much the way noise becomes part of communities in the path of jetliners. But the threat of catastrophic disease has turned these river settlements into a corridor of fear.

Kay Gaudet's list of miscarriages is only the latest manifestation of that fear. More detailed, scientific data document cancer death rates that grew as the chemical corridor grew. By the late 1970s, the area had enjoyed and endured 15 to 20 years of industrialization, the estimated latency period for carcinogens.

Statistics compiled by the National Cancer Institute show that the state has the nation's highest lung cancer mortality rate for white males, 25 percent higher than the national average during the 1970s. Six river parishes ranked among the top 10 percent of U.S. counties for such deaths, and New Orleans, in a 1974-78 survey of nine other tumor registries, scored 45 percent higher than average.

Mortality rates have increased 2.5 percent annually since 1960, and 80 of every 100,000 white males died of the disease in the 1970s compared to 52 per 100,000 from 1950 to 1969. At least one river parish ranks among the top 5 percent nationwide of deaths caused by cancer of the lung, stomach, gall bladder, intestine, liver, pancreas, bladder, thyroid, esophagus and skin.

Link to Cancer Uncertain

Pollution's role in the corridor's cancer profile is open to debate. Studies by Dr. Marjorie S. Gottlieb of the Tulane University School of Medicine showed that people who drink water from the Mississippi have "significantly higher" rates of rectal cancer than consumers of well water and that residents within one mile of large petrochemical plants have a 4.5 times higher chance of getting lung cancer than those living 1 to 3 miles away.

Industry officials say the studies are flawed because they are based on death certificates that often contain erroneous data. Dr. Walter Hubert, associate medical director of Ethyl Corp. in Baton Rouge, said that while extreme chemical exposures might lead to cancer and other serious diseases, he does not believe the levels here are high enough to have "an adverse effect on health."

But at the Ochsner Clinic in New Orleans, Dr. Velma Campbell said the studies suggest a "positive correlation" between the high cancer rates and pollution. Many physicians are concerned about "ongoing exposure . . . in low levels of cancer-causing products simply because we know that exposure to carcinogens at any level raises the risk," she said.

Campbell said corridor residents have been subjected to a "massive human experiment" in which "large quantities of a wide variety of substances have been discharged into the air and water. Now we are standing back and seeing what the outcome will be."

The question in St. Gabriel and some neighboring towns is not what, but how bad, the outcome will be. In Plaquemine, Etta Lee Gulotta started assessing the damage three years ago. Her husband, Tiger Joe, healthy all his life, died suddenly of lung cancer, and Etta Lee surveyed other households on her three-block street. Seven cancers, *four of them fatal*. Then, she canvassed within a five-block radius. *Forty more cancers.* Many of the cancers were

"It's just in every block of this small town" of 10,000 people, said Gulotta, a city councilman. "Everywhere you turn, you find somebody's got cancer."

She has heard some experts pin the cancers on smoking, but Gulotta knows that Tiger Joe never smoked. She also knows that since Dow Chemical opened in the 1960s, and other companies followed, the lightning bugs she caught as a little girl in Plaquemine have disappeared. So have the dragonflies and the river shrimp, once plentiful. The pecan trees in her backyard bore deformed nuts this year.

"It has helped the economy," Gulotta said. "But if it's going to kill us all, what good is it?"

The question echoes throughout the corridor, especially in places such as Geismar, a predominantly black town across the river from Plaquemine and next to St. Gabriel. Many families have been living there since their slave ancestors received land after the Civil War, land that once fed them. Now, they let the earth lie fallow and boil their well water. The fear began six years ago with the overnight death of 30 cows grazing nearby, local leader Amos Favorite said.

Neal Cudd was a maintenance

mechanic for seven years in one of the Geismar plants, BASF Corp., and his story prompts union leaders to question some companies' commitment to health and safety, inside and outside of their gates. Before BASF locked out Cudd and other striking workers in June 1984, he handled equipment doused in toxic chemicals, including cancer-causing formaldehyde, Cudd said in an interview in late October.

"They would send us out to pull a valve, and it would be full of chemicals," he recalled. "Impossible to do it without getting it on us. It was quite frequent that we'd have chemicals on our clothes and hands."

Two of Cudd's coworkers developed testicular cancer recent years. Another has stomach cancer. A fourth killed himself after suspecting that he had developed a brain tumor. In September, doctors told Cudd, 45, that he had kidney cancer and had three to six months to live. He died Nov. 7.

BASF general manager Lea Story said the company requires protective clothing for workers handling chemicals and that any exposure to chemicals by Cudd was "in violation of our procedure." As for health problems of BASF employees,

Story said, "We have not been able to determine any workplace relationship."

The central issue facing Geismar and the entire corridor is how to coexist with the plants. No one is recommending the shutdown of companies so vital to Louisiana's fortunes. The most common prescription is regulation.

But within Louisiana's traditional political culture, the environment has only recently received attention. There are no fulltime environmental lobbyists in Baton Rouge, while the chemical association has five and the association of business and industry has 10 more. The state Department of Environmental Quality is not funded by the legislature, relying solely on fines, permit fees and federal grants.

Every plant is required by state law to obtain permits for water and air emissions. But the legislature exempted air pollutants built before 1970, and parts of half of the state's plants qualify. Where permits are required, critics say, the state is too generous in setting limits and too lenient in enforcing them.

Companies frequently exceed their permits without penalty. There were 78 "accidental releases" and six spills by 14 of the 18 plants in the Geismar-St. Gabriel area in the first nine months of 1986, totaling 47,800 pounds and 4,100 gallons of air pollutants, according to a Sierra Club study. Among the 14 offenders, two were fined.

Industry in Government

The industry, meanwhile, has been able to retain its tax breaks (10-year property tax exemptions for new or expanding manufacturers) by controlling state boards and local councils that make such decisions. In Plaquemine, for instance, Etta Lee Gulotta is the only one of six City Council members who does not work for a chemical company.

At Louisiana State University, Dr. Paul Temple, chairman of the environmental policies department, said his staff has never received funding to study chemical pollutants along the corridor because "it hasn't been politically favorable to do so." After Gottlieb's studies suggesting a link between cancers and chemical pollution, her funding dried up.

Louisiana Attorney General William J. Guste, Jr., blames the EPA for poor regulation, criticizing the agency for "unwillingness or inability" to set limits on toxic air contaminants and for failure to investigate the health effects of heavy chemical fallout in the state.

The Clean Air Act of 1970 requires the EPA to regulate hazardous air pollutants. Seventeen years later, the agency has emission standards for seven substances, and the list does not include many of the corridor's deadliest chemicals. An EPA spokesman said the standards for the contaminants are "extraordinarily expensive and time-consuming."

One of Guste's assistants, environmental specialist Willie Fontenot, has spent so much time investigating reports of spills that he knows where he is along the corridor entirely by smell. "We must be approaching the carbon-processing plant," he will say, sticking his nose out the car window for a sniff.

During the gubernatorial primary this fall, several candidates, including governor-elect Buddy Roemer, discovered that public sentiment on environmental issues appears to be changing. One poll showed nearly 75 percent of respondents would accept stronger environmental regulations even if that meant a loss of jobs. Roemer, who has pledged that he will not outrank environmental concerns in his administration, may test that sentiment.

"There's a clear change in public perceptions," he said. "It used to be that the chemicals were viewed as being in the state and national interest. Now the feeling is that while chemicals have to be produced, we



A CHEMICAL GLOSSARY



BENZENE: A clear, flammable liquid used as a solvent in the rubber and plastics industries and as a chemical intermediate, or building block, in the synthesis of pharmaceuticals and detergents. High exposure to benzene can depress the central nervous system, causing headaches, nausea and loss of muscular coordination. Benzene is a recognized human carcinogen that causes leukemia and has been linked to epistaxis, anemia, or when the cells in the bone marrow are destroyed.

CARBON TETRACHLORIDE: A nonflammable, colorless liquid used in fire extinguishers and in industry as a solvent for oils, waxes and resins. The chemical can depress the central nervous system and cause liver and kidney damage by killing cells and interfering with the organs' normal functions. There is danger for those exposed to carbon tetrachloride if they also consume alcohol, which elicits a particularly potent reaction. Some studies with animals have shown carbon tetrachloride to be carcinogenic.

CHLOROFORM: Once the chosen anesthetic of many hospitals, the colorless, volatile liquid is now used as a solvent in lacquers and plastics. Chloroform depresses the central nervous system and chronic exposure can lead to liver and kidney damage. Some studies with animals have shown it to be carcinogenic. Chloroform sometimes appears in public water supplies as a byproduct of chlorination, but government standards regulate acceptable levels.

ETHYLENE OXIDE: A chemically reactive gas used as a sterilizing agent for surgical instruments and in the production of polyester resins, antifreeze and other things. Acute exposure to ethylene oxide can lead to respiratory irritation, skin or eye irritation. Some studies with animals have shown it to be carcinogenic.

TOLUENE: A colorless, flammable liquid found as a constituent of gasoline and paints. The greatest toxic dangers from toluene are associated with depression of the central nervous system. Humans can be exposed to higher concentrations of this chemical without toxic effects than to the other chemicals on this list. There is no evidence that toluene is carcinogenic.

VINYL CHLORIDE: A colorless gas used in the manufacture of polyvinyl chloride plastics. There is evidence that vinyl chloride is carcinogenic to humans, particularly affecting the liver; it has also been linked to tumors in the lung. Vinyl chloride depresses the central nervous system and is a suspected embryotoxin.

HOUSTON POST 8/30/87

Women worried about reason for miscarriages

Chemicals in air toxic?

By ALLAN C. KIMBALL
Post Reporter

ST. GABRIEL, La. — Women in this community of 2,100 near Baton Rouge are worried that the very air they breathe has caused 49 miscarriages in the past three years.

"I'm petrified," said Peggy Hoffman, 32, who miscarried three years ago and is pregnant again.

Louisiana's Department of Health and Human Resources began an investigation into the problem last week.

Whether a similar problem is possible south of Houston among the neighborhoods that border chemical plants is unknown, health officials said.

"It's certainly possible, but we've had no reports of clusters of miscarriages, so no studies have been made," said Mark Canfield, chief epidemiologist of the Harris County Health Department.

The National Institute for Occupational Safety and Health said more than 1 million women of child-bearing age nationwide are exposed to industrial chemicals that might cause miscarriages or birth defects.

"The only thing I can attribute the miscarriages to is the environment," said Kay Gaudet, a pharmacist who is St. Gabriel's only health professional.

She began compiling statistics after Hoffman and several of her friends had miscarriages about the same time in 1984.

"This number is way too high when compared to live birth rates in the state," Gaudet said.

Not everyone agrees with Gaudet's assumption.



Post photo by Allan C. Kimball
Peggy Hoffman, left, and Dayna Traigle outside chemical plant in St. Gabriel, La.

"We have no information to indicate there is a problem in that community. Neither have we been contacted by any physician in the area," said Gwen Bach-Stewart, a spokeswoman for the state's Health and Human Resources department. "But because of the concerns of the people there, we are going to conduct a complete scientific study."

The health department claims the miscarriage rate in St. Gabriel is 14.4 per 1,000 pregnancies, which is lower than the 14.7 statewide average and the nationwide rate of 15.

But we're not comfortable with our statistics," Bach-Stewart said. "The data we have could be off because of the way the statistics are compiled."

Gaudet said the state's figures are skewed. One year, Gaudet said, St. Gabriel recorded a 39 percent miscarriage rate.

"The trouble with the state figures is that they are only including women who miscarry and have since had a live birth," Gaudet said.

Fred Loy, spokesman for the Louisiana Chemical Association, is skeptical a problem exists at all.

"No one keeps good figures on miscarriages, so we don't know how many there really are in St. Gabe or around the state. It's frustrating to have to defend ourselves against this problem when we

don't even know there is a problem to begin with," Loy said.

If there is a problem with the number of miscarriages in the city, Loy said, it is more likely due to inherited physical characteristics or lifestyle habits of the women involved.

"We don't make nerve gas in St. Gabriel. We make chlorine and detergents like the stuff that ends up in Fab or Tide. How toxic is that?" he said.

Very toxic, according to Gaudet. She cited state statistics from the past three years showing some of the 18 chemical plants in St. Gabriel have released millions of pounds of vinyl chloride and carbon tetrachloride, both known embryo toxins.

Dayna Traigle, 26, had a miscarriage during her second pregnancy.

She had no problems with her first baby, she said. After her miscarriage, complications with her third pregnancy confined her to bed for three months. Her second daughter was born healthy.

"I don't know if it's the plants, but it's something," Traigle said. "It's not just a coincidence so many of us have miscarried. I'd be overjoyed to know it's not the plants if the state can tell us this is just the normal average."

Traigle said no one wants the chemical plants to close.

"But we'd sure like the state to come in here with stricter restrictions on them," she said.

Bach-Stewart said state health workers have met with federal health officials from Washington and the Centers for Disease Control in Atlanta to help develop their study.

In the meantime, she said, a public health nurse will be available to St. Gabriel residents to help with pregnancy problems and answer questions.

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