

La Mesa Firm Quietly Manufacturing Two Deadly Gases

By JANNY SCOTT, Times Staff Writer

LA MESA—In an undistinguished blue building beside Fletcher Parkway, next to Waterbed City and Spas R Us, a company named Phoenix Research Corp. quietly produces two of the most toxic gases known.

The gases—staples of the semiconductor industry—are arsine and phosphine, each capable of killing a person within minutes. Phoenix has made them here for 12 years, apparently safely and without serious incident.

The operation is so smooth, in fact, that public officials know little about it. Only recently, at the urging of an anonymous caller, did the city manager, chief building inspector and planning director learn the nature of Phoenix's stock in trade.

Only then did the La Mesa Building Department visit the plant and find it in technical violation of the city's Building Code. Only then did the Fire Department, which had inspected Phoenix for years, turn to county, state and federal officials for advice.

The business illustrates what some say is a common fact: Firms handling toxics in populated areas go about their work surprisingly unobserved, despite a web of

laws and agencies that seem to provide for the monitoring of toxic substances.

And even as San Diego's electronics industry steadily grows, the risk posed by the toxic substances it needs remains a matter of debate.

regulatory cracks. . . . We've always thought of arsine gas as a dreaded product of copper smelting. Now we have an industry that's hooked on it."

Arsine and phosphine are so-called "dopant gases," used to alter the electrical characteristics of materials

'It's . . . one of the real nasty ones. Put it this way: You wouldn't want an arsine manufacturer in your backyard.'

Dr. Peggy Marie Wood
Chemist and research analyst

With Phoenix, the firm and the Fire Department say the chance of a mishap is minimal. Some skeptics say that, even so, no such company should be in a residential area.

"It's the most worrisome, but it isn't unique," Dr. Joseph LaDou, acting chief of the division of occupational and environmental medicine at UC San Francisco, said of arsine. "Arsine has been falling through the

like silicon. Arsine can be made by mixing zinc arsenide and sulfuric acid; phosphine comes from mixing zinc arsenide with phosphoric acid.

Both are acutely toxic. The federal limit for on-the-job exposure for phosphine is 0.3 parts per million (ppm) over eight hours. The limit for arsine is 0.05 ppm; that's an even lower level than the one for chlorine gas.

Exposure to 500 ppm of arsine is almost instantly lethal, and 250 ppm (0.025%) is lethal after 30 minutes, experts say. Because acute arsine poisoning destroys red blood cells by freeing the hemoglobin, the most effective treatment is exchange transfusions of blood.

"It's . . . one of the real nasty ones," said Dr. Peggy Marie Wood, a chemist and research analyst with Dataquest, a high-technology market research firm based in San Jose. "Put it this way: You wouldn't want an arsine manufacturer in your backyard."

Phoenix landed in La Mesa in 1973, leaving New Jersey for Southern California to be near its clients. The low-slung brick buildings at 8075 Alvarado Road "met the requirements," said Randall Kelley, the firm's president. So he took out a business license and set up shop.

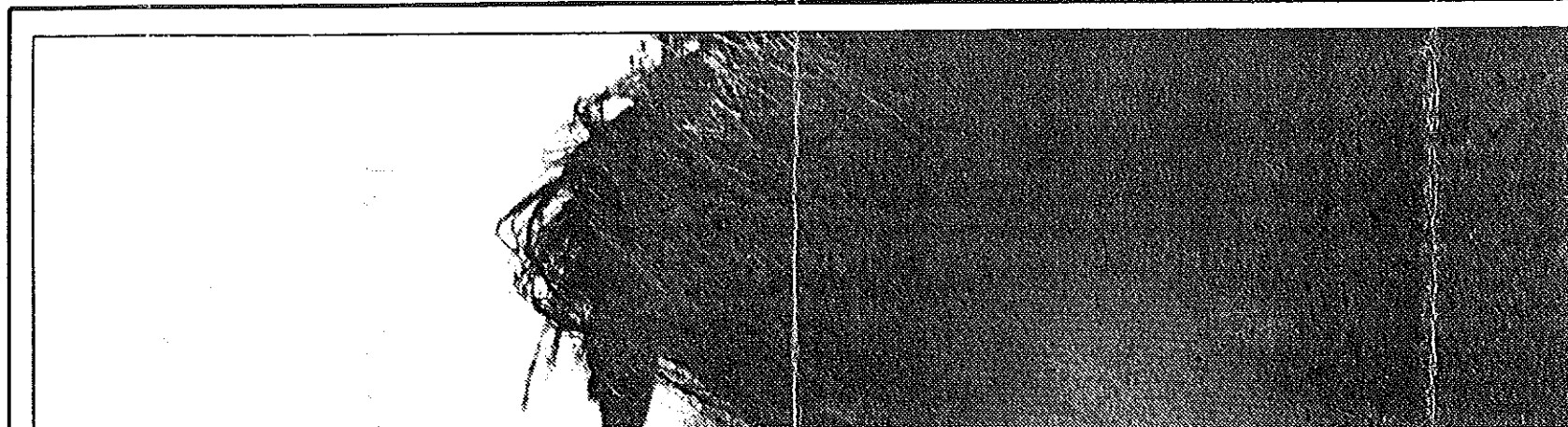
Since then, output has doubled and Phoenix now employs 20 people, Kelley said. One of only three arsine manufacturers in the United States, it sells its products worldwide. Last year, Phoenix was purchased by the Linde Division of Union Carbide.

Please see TOXIC, Page 2

San Diego Bay Tragedy Ends in the Pink

By JANNY SCOTT, Times Staff Writer

Carl Mayerhofer lost his left arm



Bao Hoang, 15, went to trial on charges involving

TOXIC: Few Keep Tabs on La Mesa Fire

Continued from Page 1

Kelley said he could not quantify how much gas Phoenix produces, but he said it is done on a "laboratory scale." He said the plant never generates more than 12 pounds of arsine gas at a time, and sells it diluted, in concentrations as high as 15%.

He said he could not estimate the amount of arsine on the site on an average day. Phoenix works on a custom-order basis, where a large order might include 20 cylinders. The numbers and sizes of cylinders at the plant vary, he said.

There have been no accidental releases of either gas at the plant, Kelley said.

The last accident was a "mild-acute exposure" of one worker about five years ago. That worker, who still works at the plant, was placed under observation and shows no evidence of ill effects from the exposure. Kelley recalled a couple other exposures in the early days, but never any kind of runaway processes.

'In the event of a catastrophic problem at that plant, who's going to apologize to the community for its being there?'

Dr. Kenneth Cohen
Industrial hygienist

He said he has been open with La Mesa; the Fire Department has repeatedly visited the plant. "Oh sure, I don't have any problem about that," he said, about the community knowing what Phoenix does. "Ah heck, I was even interviewed on TV."

Yet-city officials say the anonymous call last December came as a disturbing surprise.

As well as anyone can remember, it came in to the Planning Department after a leak at a Union Carbide plant in Bhopal, India, that killed more than 2,000 people. That leak was methyl isocyanate. According to city officials, the caller said Phoenix handled similarly dangerous stuff.

The Planning Department hadn't noticed Phoenix's arrival because the firm moved into an existing building. Explained David Wear, director of building and planning, "Somebody made a private lease decision that the government wasn't privy to."

The company's business license application offered no details either, said Assistant City Manager Bob Toone. He said the confidential application lists simply a research facility. The public record, a computer printout, lists Phoenix as a "miscellaneous business."

"Everybody's got their little problems, their skeletons in this area," Battalion Chief Gerard Lafreniere said last week. "If you ask our firefighters what's our biggest problem in terms of a hazardous material, they'd say Phoenix Research."

La Mesa has nothing remotely similar. A quiet suburb of 52,000, "the jewel of the foothills" lies just east of San Diego, ringed by conical, granite peaks. More than 50 civic groups crowd the social calendar—La Mesa Beautiful, Southwest Fossilers, the Saturday Savants.

Retail stores dominate La Mesa—"one of the premiere shopping areas in all of San Diego County," crowds the Chamber of Commerce. Only a sliver of the city is zoned industrial; there are no heavy industries or big polluters.

La Mesa passed a strict disclosure ordinance several years ago, requiring all companies and residents to report hazardous materials to the Fire Department. Lafreniere says the reporting yielded little.

Asked for Phoenix's disclosure statement, Lafreniere said he didn't have one. He said he believed that the company never filed one because the department knew what was there and had repeatedly toured the plant.

Nor does the Fire Department have a contingency plan tailored to an emergency at Phoenix. Lafreniere pointed out that fire codes offer few guidelines on toxic gases, so the department applies the standards for flammable gases.

"What I'm saying is I don't think [the codes] cover all the aspects or potentials of the materials," he said, noting that many toxic gases are new and codes are slow to adapt. "We had to burn Chicago down before we thought of building codes."

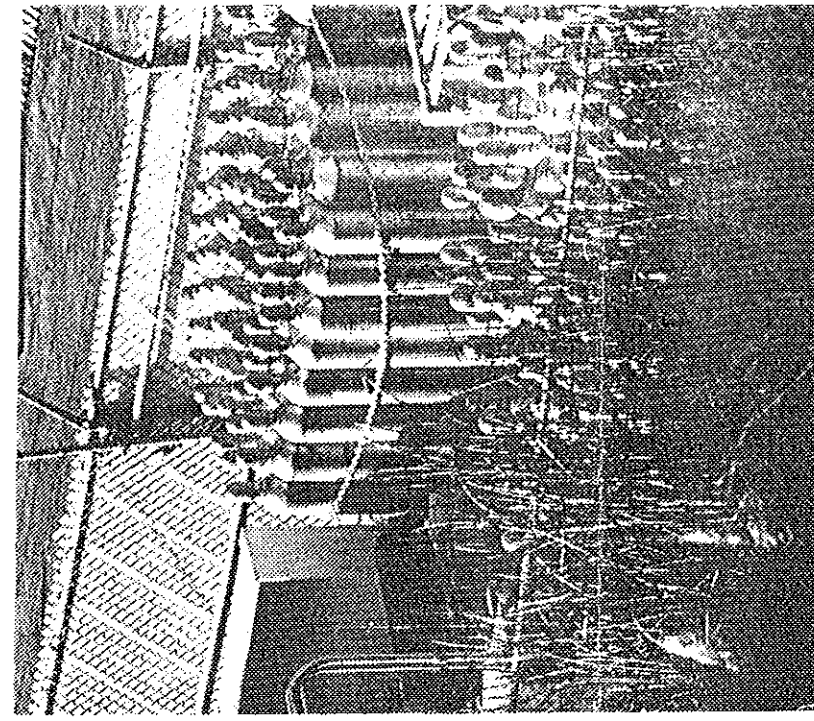
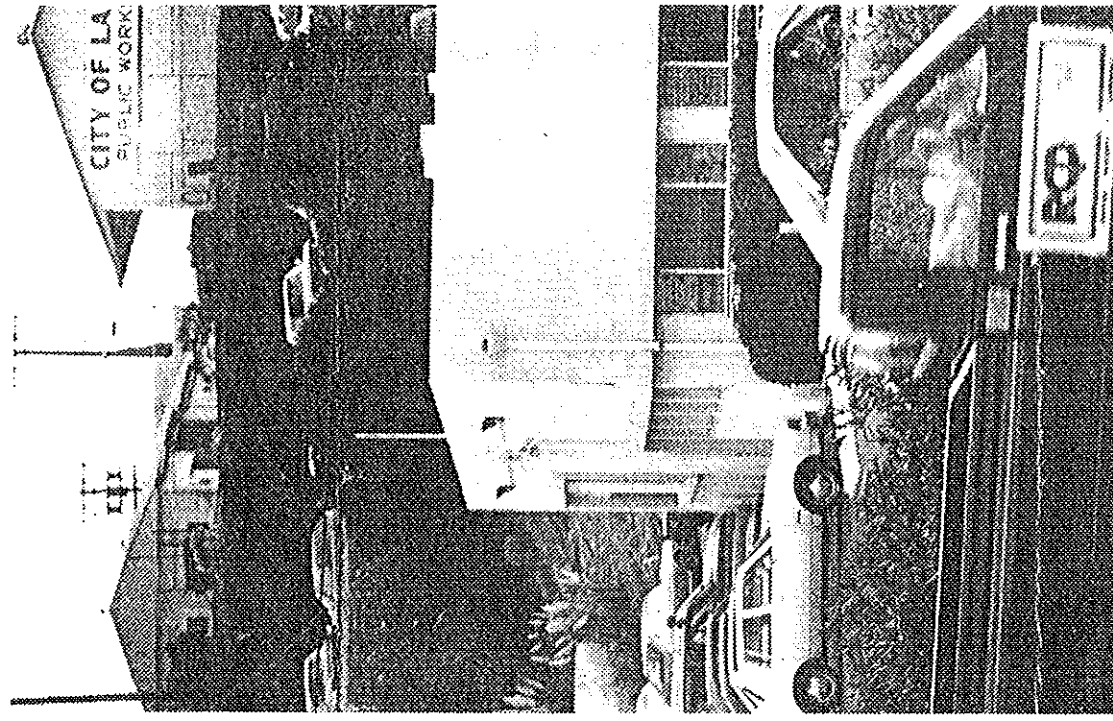
Phoenix appears to have missed close scrutiny from other agencies that might be expected to care about the toxic gas production.

County hazardous-materials officials say they have no jurisdiction over Phoenix because the county's disclosure law does not apply to La Mesa. Nor does Phoenix fall into the county's inspection program for hazardous-waste generators, since it re-uses what waste it has.

Cal-OSHA, the state occupational-safety agency, said Phoenix has registered as using a controlled carcinogen, inorganic arsenic. Though that means Cal-OSHA should inspect the plant regularly, the agency has no record of visiting Phoenix.

However, Cal-OSHA routinely purges its records after three years. Kelley said he recalled agency inspectors coming to his plant once, shortly after it opened.

Kelley and Lafreniere are confident that Phoenix keeps its risks to a minimum—a view shared by a captain with San Diego's hazardous-materials team and a county

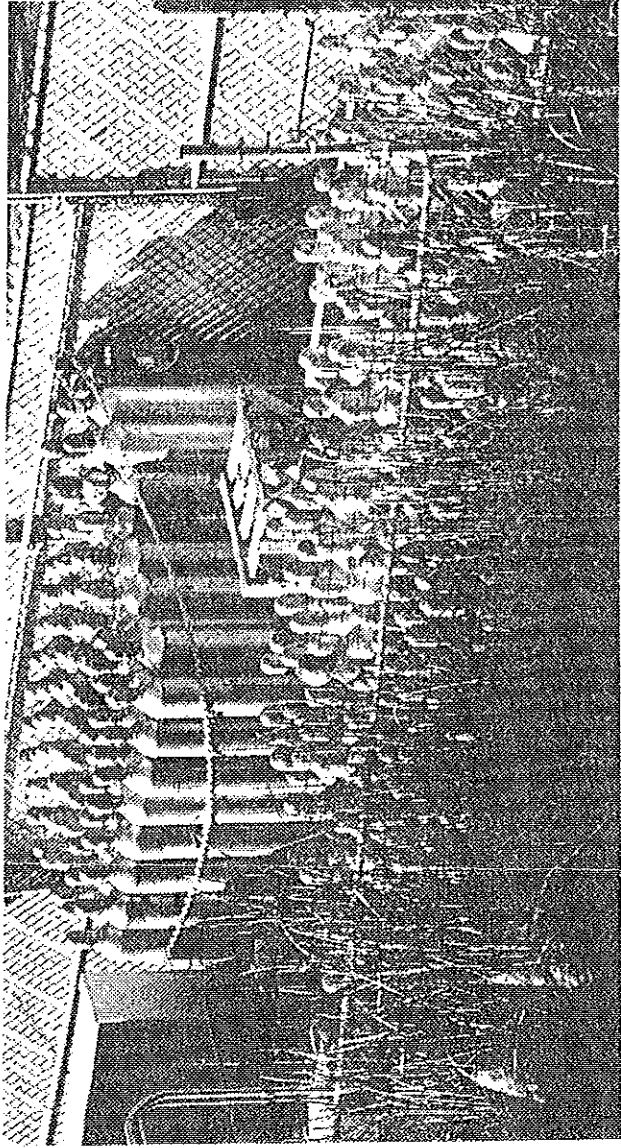


seeks Kelley's help in handling incidents in San Diego. "As far as phosphine and arsine are concerned, he's probably the most advanced anywhere in the nation."

But even Kelley acknowledges unpredictables.

at the Denver Clinic and a toxicologist who has studied

"But if there's an explosive release or a terrorist act, there's no capability whatsoever during the problem," he thinks it should not be in an



produces two of the most toxic gases known. The busy area contains many small businesses and Grossmont Shopping Center is less than one-half mile away. At the rear of the building is a storage area for empty cylinders.

seeks Kelley's help in handling incidents in San Diego. "As far as phosphine and arsine are concerned, he's probably the most advanced anywhere in the nation."

But even Kelley acknowledges unpredictables.

"I guess I worry most about whether we've seen everything or not," he said. "When you design processes, you look to see whether your engineering is adequate. We have to look at our safety record and say we're doing very well."

"But I think a man who says he's absolutely sure is a fool. From an objective point of view, only a fool ever says he's sure."

Which is why skeptics say no arsine plant should exist in a populated area.

"They can tell you about all the facilities and the alarms, but that's for within the facility," said Dr. Daniel Teitelbaum, director of occupational medicine and toxicology

at the Denver Clinic and a clinical toxicologist who has studied arsine. "But if there's an explosion or a release or a terrorist act, they have no capability whatsoever of handling the problem," he said. "I think it should not be in any urban area. I think it's just madness."

"In the event of a catastrophic problem at that plant, who's going to apologize to the community for its being there?" said Dr. Kenneth Cohen, an industrial hygienist who lives in neighboring El Cajon and serves as a consultant to corporations nationwide.

"If nothing happens, then my opinion would be viewed as incorrect," he added. "If Murphy's Law takes place and an accident happens, then they're going to say, 'Well, crazy Ken Cohen was possibly right.'"

If the Phoenix plant caught fire, Lafreniere said, he would probably let it burn on the principle that a hot fire would burn off any leaking gas and carry the residue high into the atmosphere, in what firefighters refer to as the chimney effect. He would begin by evacuating

everything within a quarter of a mile, which is largely business and industrial, then move out to half a mile if necessary. Atmospheric conditions would be critical in the event of a fire or a leak. Lafreniere said arsine is heavier than air and would tend to cling to the ground.

Asked whether Phoenix's neighbors know about the plant, Lafreniere said, "I really don't know if they do or not. . . . We try to protect people. But going around telling people the sky's falling is not our philosophy."

There have been changes since the anonymous call.

In the Building Department, Pope has ordered Phoenix to modify its buildings to bring them into compliance with the Building Code. An architect for Phoenix has submitted plans that the city is in the process of approving. (The violations were technical and the changes involve such things as altering the use of space within the plant.)

Lafreniere has checked with the Federal Environmental Protection Agency and worked with the haz-

"miscellaneous business.

The chief building official said his office misunderstood Phoenix for the same reason. "If we had known the type of material they were to use, we would have made comments," said George O. Pope. Instead, they inspected it once as a research facility and never went back.

Only the Fire Department seems to have known.

Fire inspectors have toured the Phoenix plant regularly since 1973 and are familiar with its layout and operations. The department's files include a term paper on arsine and phosphine by one inspector. Fire officials say the entire department is familiar with Phoenix.

ous materials team and a county hazardous-materials specialist who toured the plant at La Mesa's request.

According to Kelley, the plant is monitored 24 hours a day. He said any gas leak would set off an alarm. Little gas would escape, since the cylinders are small and unattached. He said air filtering would prevent anything from getting outside.

Only the worst earthquake could violate the gas cylinders, Kelley said. As for fires, the buildings have sprinklers. Kelley says ventilation and engineering controls make the chance of fire "extremely low."

"It's a well-run operation," said San Diego Fire Capt. Craig Black, whose hazardous-materials team

ardous materials division of the county, which now has asked Phoenix to prepare an emergency plan. City files have grown fat with interdepartmental memos (one referring to Phoenix's product as "arsenine gas").

These days, no one seems to offer an unqualified defense of the plant's location.

"It's hard to argue with that issue. I suppose," said Kelley, who lives with his family a short distance away. "It's like arguing with motherhood and apple pie. Maybe in the environment we live in today, if we were going to site a new plant, we would probably try to locate it in an area that was not so densely populated. It's a good common sense."

"There's two things: reality and perception of reality. It doesn't matter which it is, society has to be satisfied on either account. I think the perception is just as important as the reality. We can make a facility extremely safe, but you will never be able to overcome in today's environment that that's not a good thing to do. I would bow to that."