



A Division of The Society of The Plastics Industry, Inc.

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August 13, 1987

The above
8/25/87 WCB

TO: The VI Health, Safety and Environment Committee

RE: Plaquemine, Louisiana Newspaper Article on Vinyl Chloride Effects in Miscarriages

R&S 040529

I attach a copy of a newspaper article which appeared in the Plaquemine, Louisiana newspaper on Thursday, August 6th, which has been sent to me by Mitch Beaird of Georgia Gulf. Separately, I have discussed this with Beverly Gholson, an attorney at Georgia Gulf who called me regarding information that we had on this subject.

The latest information that we have is contained in the chapter by John Barr in the Encyclopedia of PVC, second edition, pages 252-254, and largely indicates that there is no data which points unambiguously to a relationship between vinyl chloride exposure and reproductive outcome.

If your company has any later information regarding vinyl chloride and reproductive outcome, I would appreciate your sending it to my attention as soon as possible. We may want to consider developing a "white paper" on this subject for possible future use.

Roy T. Gottesman

RTG/pmb
cc: M.N. Scheck

Vinyl chloride's effects in St. Gabriel investigated

By Kathy Yates
Associate News Editor

An investigation which began with questions from residents in St. Gabriel has lead me down a complicated path from the Department of environmental Quality, a division of the Environmental Protection Agency, to the LSU Library, in search of the answers they requested. Unfortunately, my expertise is not in Chemical Engineering or scientific analysis. Therefore, it is not my position to offer the following information as a conclusive answer to those questions being raised in the community of St. Gabriel. The information compiled herein actually is a continuation of their original questions, Is it possible that the emissions of Hazardous Air Pollutants from the chemical plants in the St. Gabriel area, could have, in some way, contributed to the miscarriages, and other medical and health related problems that residents of the community suffer from?

It has been said that rising concern in the St. Gabriel area over the past few months in relation to the allegedly high rate of miscarriage and still births, has prompted investigations to be initiated in various state agencies and with a conglomeration of environmentalist groups.

Congressman Charles "Buddy" Roemer contacted the Attorney General's office asking for an investigation after he was made aware of the suspicions of some women in St. Gabriel who had suffered miscarriages and still births. Willie Fontenot, of the Attorney General's Office confirmed that he had sent a letter to Dr. Sandra Robinson of the Department of Health and Human Resources asking them to investigate.

"Basically, in 1984, out of 10

ladies that knew each other, nine had miscarriages and one had a live birth," Fontenot explained.

He said he had told DHHR about this, and continued saying, "Georgia Gulf and B.F. Goodrich have had numerous leaks and releases through the years of vinyl chloride."

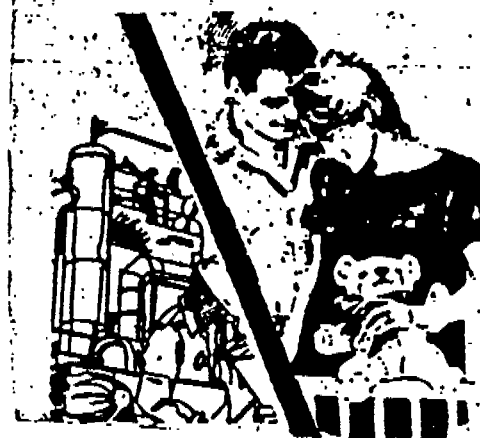
Dr. Robinson at DHHR said that she didn't have the manpower to initiate an investigation as extensive as this one, at this time, but that she did however, have some of her staff trying to compile birth records and statistics from the St. Gabriel area.

When I first began this investigation I spoke with Kay Gaudet, a pharmacist in St. Gabriel. She supplied me with names of some women who she knew had suffered miscarriages and difficult pregnancies. She also told me of the group of women in the area, the ten ladies who were all pregnant at the same time, and nine had miscarriages, that Fontenot had spoke of. She added though that these ladies all suffered their miscarriages in the same six to eight month time period, between late 1984 and early 1985. Gaudet went on to explain that the national average for miscarried pregnancies is 8.9 for every 1000 live births. She explained that it would take St. Gabriel 15 1/2 years to have 1000 live births, therefore St. Gabriel exceeded the National Average in just six months.

The women I spoke with labeled Vinyl Chloride a "fetal toxin". One woman said, "Vinyl Chloride causes spontaneous abortion in pregnant women."

Vinyl chloride is a human carcinogen, is labeled as an EPA hazardous waste and a priority toxic

(See VINYL CHLORIDE, page 2A)



VINYL CHLORIDE

(Continued from page 1A)
pollutant.

The compound is usually encountered as a cooled liquid, yet is actually a flammable gas at room temperature. Vinyl chloride is a colorless gas and is basically odorless. Yet at its threshold of human detection has a pleasant ethereal odor, similar to that of gasoline fumes.

I called upon Mr. Bill Davis of DEQ, head of the LESHAP surveillance. (Louisiana Emissions Standards for Hazardous Air Pollutants), this division of the PA/DEQ is the office which assesses whether or not a particular emission of vinyl chloride was preventable. Once an emission is assessed as either preventable or non-preventable they begin the process of determining if any action could be taken against the violator. Once the Environmental Quality Act has been violated, the DEQ then decides what action, if any, could be taken against the plant. Davis could not confirm the statement by the women I spoke with concerning vinyl chloride being a fetal toxin or causing spontaneous abortion in pregnant women, he could only tell me in regard to the subject that the DEQ inspectors, those who go to the plants to do annual inspections and medical inspections to determine preventability of a particular emission, cannot be women of childbearing age.

In search of proof that what these women had told me was in fact scientifically tested and proven somewhere, I called Dr. James E. Egan, Iberville Parish Coroner. Egan also could not confirm. He did, however, agree with me saying that vinyl chloride has been proven to cause angiosarcoma, cancer of the liver. Davis had me that this was discovered at Goodrich plants in Kentucky.

I went to the LSU Library in search of support for what these women had told me. In a book called "Mutation, Cancer, and Malformation", written by Ernest H.Y. Chu and Walderico M. Generoso, under the subheading "vinyl chloride", I found support for their theory.

"An increased fetal mortality was observed for the wives of workers who had been exposed to the compound, and other studies have indicated an increased risk of birth defects in children of parents residing in the vicinity of vinyl chloride production and polymerization plants," the passage read.

Georgia Gulf, Dow Chemical and B.F. Goodrich use vinyl chloride in their production processes. Dow produces the chemical itself and sells vinyl to B. F. Goodrich by pipeline, and ships the chemical by rail also. When shipped by rail, the chemical is a liquid under pressure.

Georgia Gulf also produces vinyl chloride and sells the chemical. They also are a polymerization plant, producing Polyvinyl chloride from the vinyl chloride monomer, or creating PVC from VCM.

B. F. Goodrich, as mentioned before receives its vinyl chloride from Dow Chemical by pipeline, and they produce PVC resin and some PVC compound. Their polymerization plant produces the granular type resin to be shipped out for the creation of such products as pipe fitting, construction industry electrical fittings, wrapping products, such as plastic wrap. That part of the PVC resin made into compound is sold for things such as plastic bottles.

In search of facts as to how much of this toxic chemical has actually escaped to the atmosphere in recent years, I went to the main office of DEQ in Baton Rouge. I was allowed to examine files which contained information concerning the amounts of vinyl chloride which had been released. Under the direction of Bill Davis, I was given files for Georgia Gulf, Dow Chemical and B. F. Goodrich.

Some of the files were incomplete and others simply listed a date that an emission occurred without listing the amount involved. The entire year of 1984 of the Georgia Gulf surveillance file was nowhere to be found. Therefore, only limited information concerning that particular time period was made available to me.

Davis was successful in obtaining some information from another source concerning this year.

From the available records, the approximate number of total

pounds of vinyl chloride released from these three plants from 1981 until the beginning of 1987 added up to 153,097.89 lbs.

Sources of these releases varied but most were safety valve releases, pumps and other malfunctioning equipment. However, everytime a plant starts up or shuts down usually large emissions occur, this is also true of shutting down the boilers for inspections and other operations. On some occasions of boiler shut down, in which the EPA had given their permission to the plant to conduct the shut down fully aware that chemicals would be released, a very large amount of hydrocarbons were emitted.

Breaking this down, the incomplete Georgia Gulf files revealed 96,156.89 lbs of vinyl chloride released. Dow Chemical reported 2,253.80 lbs., and B. F. Goodrich totaled 41,687.30 lbs. emitted over the past 5 1/2 years.

The years of the most concern to those residents in St. Gabriel involved in this issue are those of 1984 and 1985. According to those DEQ records available, Dow Chemical's total emissions from 1984 and 1985 were 288.00 lbs.

From 1984 to 1985 B F Goodrich emitted 24,612.35 lbs. of vinyl chloride according to DEQ records.

Georgia Gulf, between 1984 and 1985 according to the incomplete records at DEQ, had a total of 29,633.48 lbs. of VCM released to the atmosphere.

Georgia Gulf's releases for that time period included a 17,760 lb. release of vinyl chloride on November 13, 1985 from their PVC plant and 9,142 lbs. that same day from their VCM plant. These releases also included a 1,900 lb. emission on April 23, 1985 from their VCM plant.

B F Goodrich's releases during this time period included a 5,400 lb. release of vinyl chloride on January 19, 1984; and a 3400 lb. discharge on January 29, 1984. On June 22, 1984, they released 2,000 lbs. of vinyl chloride to the atmosphere and on August 15, 1984 6.8 lbs. with a 7,905 lb. release on August 21 of that year. In 1985, they emitted 4,800 lbs. of VCM on May 6.

According to the DEQ records, Dow's total reported emissions from 1986 up to date total 45.50 lbs. of VCM emitted to the atmosphere.

However, in 1983 Dow Chemical released 4,425.31 lbs. of VCM to the atmosphere according to the records. These emissions included a 300 lb. release on December 4, 1983, 750 lbs. on April 15, and the same week on April 18, 3,080 lbs. were released from the plant.

In 1981 and 1982 Dow released 10,495 lbs. according to the files. These releases included an 8,925 lb. release on October 22 of 1982 and a 1 lb. discharge on August 11, 1982.

B F Goodrich, which receives it's vinyl chloride from Dow Chemical by pipeline, emitted 13,429 lbs. of VCM to the atmosphere in 1983. These emissions included a 7,500 lb. release on October 18 of 1983 and 5,000 lbs. on December 14, 1983.

In the years 1980 and 1981, B F Goodrich released 11,350 lbs. of vinyl chloride to the atmosphere.

In 1983 the U.S. filed suit against B F Goodrich in relation to it's vinyl chloride emissions. The company had to pay approximately \$100,000.00 to the state as a result of these complaints.

Georgia Gulf's emissions in 1986 and part of 1987 total to 5,796 lbs. of vinyl emitted.

From 1980-1982 the company released 52,597 lbs. according to DEQ records which went only as far back as 1980.

On September 20, 1985 a proposed consent decree in United States vs. Georgia Pacific Corporation was lodged with the United States District Court, Middle District of Louisiana. The complaint filed by the U.S. alleged that the Georgia Pacific Corporation violated the Clean Air Act and the Vinyl Chloride National Emissions Standard for Hazardous Air Pollutants, by discharging vinyl chloride from its ethylene dichloride/vinyl chloride and polyvinyl chloride facilities. Georgia Gulf now is the owner of the plant and consequently intervened in the action to effectuate the injunctive relief sought by the U.S. under Consent Decree. The Consent Decree required the plant to adhere to a Remedial Action Plan and ensure compliance. The company had to pay \$562,500.00 in civil penalties to the U.S. and an additional penalty of \$62,500.00 to the State of Louisiana.

Vinyl chloride is used as a vinyl monomer in the manufacture of

polyvinyl chloride and other resins. According to *Mutation, Cancer and Malformation*, by Ernest H.Y. Chu and Walderico M. Generoso, over 90 percent of vinyl chloride monomer is used in the production of vinyl chloride homopolymer and copolymer resins used in the building and construction industries. The compound is used in the creation of such things as plastics, varnishes, silk and paper coatings and refrigerants.

According to the *Handbook of Toxic and Hazardous Chemicals*, by Marshall Sittig, the hazards of vinyl chloride was originally believed to primarily concern workers employed in the conversion of VCM to PVC (vinyl chloride monomer to polyvinyl chloride) who may receive a particularly high exposure of VCM in certain operations, or long term exposure to relatively low concentrations of VCM in the air at different factory sites. Much larger populations are now believed to be potentially at risk, including: producers of VCM, people living in the close proximity to VCM or PVC producing industries, users of VCM as propellant in aerosol sprays, persons in contact with resins made from VCM, consumers of food and beverage products containing leachable amounts of unreacted VCM from PVC packaged materials (plastics, etc.), and ingestion of water containing unreacted VCM leached from PVC pipes.

In 1976 it was estimated that almost one million persons were associated with manufacturing goods derived from PVC.

This same publication says, "Incinerators may be an additional source of vinyl chloride emissions since the entrapped monomer escapes following incomplete combustion of PVC products."

According to the "final rule" of the DEQ Regulations and Procedures for Unauthorized Discharges, which became effective November 19, 1985, the reportable quantity level for vinyl chloride is one pound. This level is applicable regardless of the environmental medium, (land, air, water, groundwater) into which the pollutant is discharged. This is the limit the DEQ has set for the plants to report an emission.

According to the permissible exposure limits in air listed in the *Handbook of Toxic and Hazardous Chemicals*, the federal standard for exposure to vinyl chloride sets a limit of 1 part per million over an 8 hour period, and a ceiling of 5 ppm averaged over a period not exceeding 15 minutes.

The chemical is absorbed both through inhalation and skin absorption.

According to the *Handbook of Toxic and Hazardous Chemicals*, medical disorders associated with vinyl chloride include: acroosteolysis, Raynaud's phenomenon, and sclerodermatous skin changes. Chronic exposure may also cause hepatic damage.

Vinyl chloride is regarded as a human carcinogen and a cause of angiosarcoma of the liver. Excess cancer of the lung and lymphatic and nervous systems has also been reported. Experimental evidence of tumor induction in a variety of organs, including liver, lung, brain and kidneys, as well as nonmalignant alterations such as fibrosis and connective tissue deterioration indicate the multisystem oncogenic toxicologic effects of vinyl chloride.

In agreement a book called *Chemical Hazards of the Workplace* by Nick H. Proctor, PhD, toxicologist and James P. Hughs, MD explains that there is an increased incidence of malignant tumors, acroosteolysis, Raynaud's syndrome, scleroderma, thrombocytopenia, circulatory disturbances, and impaired liver function; very high concentrations cause central nervous system depression,

associated with the intake of varied amounts of vinyl chloride.

Radiologic findings in patients with acroosteolysis included lytic lesions in the distal phalanges of the hands, in the styloid processes of the ulna and radius, and in the sacroiliac joints. Of 20 autoclave workers with exposure to vinyl chloride, 16 had thrombocytopenia, seven had splenomegaly, six had hepatomegaly, 14 had fibrosis of the liver capsule and four had lesions of acroosteolysis in one study in this same publication.

The passages made reference to numerous other disorders found in workers of VCM plants, including one study which saw 25 cases of acroosteolysis, (degeneration of terminal phalanges).

Also found in *Chemical Hazards of the Workplace*, "Over 30 cases of angiosarcoma of the liver have been reported among vinyl chloride polymerization workers in the Uni-

ted States and nine other nations. Because this tumor is extremely rare, the occurrence of these cases under similar occupational conditions strongly suggests a casual relationship to some phase of vinyl chloride production. Clinical features of seven patients with the carcinoma varied from no signs or symptoms to weakness, pleuritic pain, abdominal pain, weight loss, gastrointestinal bleeding, and hepatosplenomegaly; liver function abnormalities were present in all subjects but without a consistent pattern. In addition to the malignant tumors, four cases of nonmalignant hepatic disease characterized by portal fibrosis and portal hypertension have been attributed to vinyl chloride exposure."

Continuing in this publication, the author lists symptoms and signs of exposure as: "weakness, pleuritic pain, abdominal pain, anorexia, weight loss, gastrointestinal bleeding; hepatomegaly, splenomegaly; Raynaud's syndrome, lesions in the distal phalanges of the hands; central nervous system depression."

Numerous publications supported this fact, that vinyl chloride exposure causes cancer of the liver or angiosarcoma, including a passage in *Mutations, Cancer and Malformation* which listed a key event in which workers in numerous countries showed an increased incidence of angiosarcoma.

Angiosarcoma is a very rare disorder of the liver. I have also found evidence that vinyl chloride exposure clearly produces gene mutations and primary DNA damage. Reference was made to problems in genetics and chromosomal defects in relation to exposure.

DHHR has not yet compiled any statistics that they would release on the birth rate in the St. Gabriel area. I am presently awaiting those statistics along with statistics on incidences of cancers and other related material from an area hospital.

According to Tom Ballenger, Director of the State Center for Health Statistics, in 1982 Iberville Parish averaged slightly over the state average for still births. From the years 1983-1986 Iberville was slightly under the state average for still births, and in 1986 none of those cases reported came from St. Gabriel.

According to those women I spoke with in St. Gabriel, instances of miscarriage and still births are higher than Ballenger's figures indicate. One of these women said that from 1983 to 1985 out of 17 pregnancies there were 15 miscarriages and one live birth.

Several of the women went on to have children later but had to have progesterone (a female hormone) supplements during their pregnancies following their miscarriages. None of these women had any instances of this type of complications with childbearing in their family histories.

If this is indeed fact, we may find reasoning behind these occurrences, and that reasoning may not necessarily be those chemical emissions between the years of 1983-85. The evidence I mentioned briefly before concerning genetic and chromosomal damage after exposure has opened up another field of investigation. The question of the generation before this one's exposure now arises. Their parents, many of which lived in the area years ago when limits set on vinyl chloride and other hydrocarbon emissions were not as strict as they are now, could possibly be the ones who's intake was too great.

This theory I will try to support with more research, but to begin I quote from *Mutation, Cancer and Malformations*, "Only dominant mutations and certain chromosomal defects will have clinical effects in the first generation. The persistence of mutations depends upon the biologic fitness of the phenotype. If carriers of a given mutation have no offspring because of lethality or infertility, the mutation will only persist for one generation. Mutations of the heterozygote type will be similar to that of normals. Such mutations will persist for many generations."

In addition to the information presented in this article, I have documented evidence of releases of Chlorine and other hydrocarbons and their effects on the human body and the environment which I will present with further research at a

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This was a separate article.

DEQ launches investigation into stillbirths in St. Gabriel area

The Department of Environmental Quality has in progress a fact finding mission to provide answers to a possible link between allegations of miscarriages and stillbirths in the St. Gabriel and the environment.

"The DEQ staff has put together a comprehensive plan to provide us with a variety of information which we can share with DHHR," Martha Madden, Secretary of DEQ said. The Department of Health and Human Resources, working in conjunction with federal Centers for Disease Control, is the lead agency

in the investigation into the problem in St. Gabriel.

The DEQ plan calls for information from six different areas. These include:

1. An inventory of chemical products and by-products produced in the St. Gabriel area;
2. A study of accidental spills and releases over the past five years;
3. A retrospective study of baseline data on air and water quality;

4. Groundwater testing of monitoring wells;

5. Tests of drinking water sources and

6. Conduct soil and surface water sampling.

"We have been working on answers to the many questions raised by this incident in St. Gabriel," Madden concluded. "Be assured DEQ is well in the forefront in its duty to help DHHR solve this problem."