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PUBLIC RELATIONS

AMMERMAN MEDIA TRAINING

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TO: JIM RUTLEDGE

FROM: John D. Olson
DATE: February 23, 1987

Interoffice Communication

VISTA

SUBJECT: EFFECTIVE MEDIA COMMUNICATIONS SEMINAR

As you requested, I'm sending you the attached information as confirmation of my plans to attend the Ammerman Enterprises seminar on March 9 and 10, 1987.

John D. Olson by AWS

JOHN D. OLSON
PROCESS SUPERINTENDENT

JDO/lo

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Name: John D. Olson
Title: Process Superintendent
Location: Vista Polymers
Oklahoma City PVC Plant
5200 S.E. 59th Street
P. O. Box 15360
Oklahoma City, OK 73071

Vista's Oklahoma City Plant manufactures polyvinyl chloride resin (PVC) for downstream processing by customers to produce PVC plastic pipe and house siding. The plant employs 49 people. The Process Superintendent is in charge of the plant's production department, consisting of 4 Shift Supervisors and 16 Operators. The plant maintains a 24-hour operation staffed by Production personnel on a rotating shift schedule. Maintenance and Office personnel provide support on a regular, 40-hour week work schedule.

Potential problems at the OKC PVC Plant are those common to many modern chemical processing plant. These include:

- The plant process utilizes vinyl chloride monomer (VCM) as a feedstock. VCM is a highly flammable, carcinogenic material. Several million pounds of VCM are stored and processed in the plant at any given time. Extreme caution must be utilized in handling the VCM to ensure safe operation of the plant.

- EPA and OSHA regulations strictly limit quantities of VCM that can be emitted to the atmosphere. Established operating procedures are utilized to ensure compliance with these regulations.

- A residential neighborhood and several other manufacturing facilities are located within ½-mile of the plant. A significant gas release or fire at the plant could affect these neighbors.

- Safety procedures and policies must be strictly followed and enforced at the plant to ensure the safety and health of plant personnel.

Biography

John Olson the youngest of the three children of Edwin and Easther Olson was born on December 25, 1954. John spent his first eighteen years in the small town of Russell, Kansas. Aside from attending twelve years of public school, John spent his time in Russell involved in football, wrestling, track, band, and many outdoor sports including hunting and fishing. John held several part time jobs such as furniture delivery, farm work, house shingling, road construction, and gopher for the City Electrical Department. John graduated high in his high school class and elected not to attend college the following year. Rather, he obtained a job building houses and was later employeed as a grain

Biography (Cont'd)

elevator operator. After a year away from school, John enrolled in the University of Kansas at Lawrence, Kansas. Four years later John graduated from K.U. with a B.S. degree in Chemical Engineering.

In July of 1978, John obtained a job with Conoco in Ponca City, Oklahoma. John worked as a Chemical Engineer in the Chemicals Division of Conoco's Process Engineering Department. John's job assignments involved process engineering design work for Conoco's PVC manufacturing facilities in Oklahoma City, Oklahoma and Aberdeen, Mississippi. In April, 1980, John was transferred to the Oklahoma City PVC Plant as a Process Engineer. He spent the next four years involved in the design, construction, and optimization of chemical processing equipment at the Plant. In June, 1984, John was promoted to the position of Process Superintendent at the Oklahoma City Plant. The Plant became a part of Vista Chemicals in July, 1984, as the result of a leveraged buyout of the Conoco's chemical operations.

John, currently is still the Process Superintendent at Vista's Oklahoma City PVC Plant. He resides in Norman, Oklahoma. His interests and hobbies include snow skiing, golf, scuba diving, hunting, boating, guitar, and stereo equipment.

To: Jim Rutledge - Houston

From: Gary Foshee - LCCP
Date: January 26, 1987

VISTA

Interoffice Communication

Subject: Effective Media Communications Seminar

This letter will confirm my plans to attend the seminar and provide the information you requested:

Title: Chief Process Engineer
Lake Charles Chemical Plant

Address: Vista Chemical Company
Lake Charles Chemical Plant
Old Spanish Trail
P. O. Box 727
Westlake, LA 70669

I was born and raised in Louisiana, graduated from Louisiana Tech University and worked three years for Dow Chemical Company before joining Vista as a Process (Chemical) Engineer in 1969. Since then, I have worked as Senior Process Engineer at LCCP, Chief Process Engineer at LCVCM and currently Chief Process Engineer at LCCP. The Chief Process Engineer is responsible for the supervision of the Process Engineering Department. This position is expected to supervise this function to maximize effective operation and provide technical expertise to the operating departments. In addition, the position directs Process Engineering recruitment, career development of Process Engineers, and initiates cost effective programs and projects. There are three (3) Senior Process Engineers reporting to me with fifteen (15) Process Engineers reporting to the Senior Process Engineers. The Chief Process Engineer reports to the Director of Technical Services who reports to the Plant Manager.

The plant produces chemicals derived from oil and natural gas. The chemicals produced in the plant are ethylene, alcohols, normal paraffin, methyl chloride, solvents, and alumina as a byproduct of alcohol production. Other smaller byproducts streams are produced and must be either sold or handled in an environmentally acceptable manner.

A waste water treatment system which usually works very well has some problems in cold weather operation and takes a lot of attention during this time. There are many Federal, State, and Local environmental regulations that must be complied with.

The Process Engineering Department is made up mostly of young chemical engineers with less than four (4) years experience.

If you would like additional information I would be glad to provide it.

Gary Foshee

G. L. Foshee

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RPR MEDIA PLANNING #1

'86-'87

PVC Makers Look for Growth As Environmental Fears Ebb

Producers of polyvinyl chloride are confident that the market for this plastic will continue to grow, as environmental fears, particularly in the plumbing, electrical conduit and food packaging areas, are allayed.

According to the Vinyl Institute, a trade association representing leading producers of the plastic, the market for US-produced PVC should grow by 9 percent this year, to 7.3 billion pounds (including exports).

Although they expect growth to slow down to around 3 percent next year as new tax legislation and changing interest rates impact construction, which accounts for over 60 percent of the total PVC market, the long-range projections for the market are optimistic.

Piping, draining and vent applications, which currently account for about 3 billion pounds of demand per year, should more than double in the next three to five years, says Ray Gottesman, executive director of the institute, as designer's and builders' perception of the plastic change.

Similarly, demand for food-grade resin in packaging applications should reach almost 600 million pounds by 1988, he says.

In a recent survey of 550 architects, builders and code officials throughout the country, most professionals praise the durability of the material and say they plan to use more of it in the future, particularly in electrical conduit applications.

According to the study, sponsored by the institute, siding and plumbing pipe applications currently have the highest recognition levels among building professionals.

Lower recognition levels were found for window, flooring and gutter uses. According to Mr. Gottesman, this represents a challenge to the industry to communicate the benefits of vinyl products more broadly.

Controversy has surrounded the use of PVC in electrical wire and cable and plumbing pipes since 1982, when the first Fire Toxicity Conference issued data on PVC's toxicity in fire situations.

This same year, a study conducted by James Montgomery consulting engineers in California showed that PVC plumbing pipe leached harmful chemicals into drinking water.

Not surprisingly, the Vinyl Institute was founded that year, to modify what producers feared were developing misconceptions about the plastic.

Despite the fact that PVC has been fully approved by EPA and NSF for use in plumbing and wiring applications, and that the three national model building codes universally approve its use in piping and electrical conduit, there has been a movement to block its use in plumbing pipe in California, where union plumbers filed a suit restricting its use in 1979. In 1982, they were granted a court order halting new approvals of PVC pipe.

Makers of vinyl have long hoped that the plastic would fully replace metal in water

Continued on Page 33

PVC Producers

Continued from Page 9

pipe applications. Not only do they contend that PVC is environmentally safer than copper, which leaches amounts of metal and lead from solder in excess of EPA limits, they say the plastic shows lower sedimentation and higher corrosion resistance, requires no welding, costs less than metal pipe and can be installed in little more than half the time needed for copper.

California plumbers, citing the results of the Montgomery study, allege that PVC leaches hazardous levels of trichloromethane and chloroform. They also claim that the organic solvent cement used to join the piping leaches unacceptable levels of MEK, cyclohexanone, THF and other organic compounds. Furthermore, they say, NIOSH has questioned the validity of the solvent cement labelling.

According to Mr. Gottesman, the Montgomery study contained many procedural inaccuracies. For example, phthalate esters, used only in flexible PVC production, were found in the leachate, suggesting that flexible tubing, rather than the rigid PVC used in pipe, was used in the test.

As far as the solvent cement issue is concerned, he says, organic levels dissipate after eight months; a thorough flushing of the pipe before use will eliminate the problem.

The California Housing and Community development, pressured by plumbers union groups, contracted additional studies of PVC piping and recommended a complete Environmental Impact Report.

EIR STILL PENDING

Four years later, the report is still not finished. As Mr. Gottesman explains, the first consulting firm hired to conduct the study, botched the procedure. Now HCD wants to conduct the test in conjunction with the University of California.

Last year, the Vinyl Institute conducted a study in conjunction with McKesson Environmental Services, using a "worst case" plastic pipe system with CPVC, and contrasting leachate levels with those of a traditional copper pipe system.

Control of the project was turned over to the consultant, and results submitted this July showed no carcinogens leached from either the CPVC or the solvent cement, and only trace amounts of other organics, in the part-per-billion range.

In contrast, the metal system leached potentially hazardous amounts of copper and lead from solder. Other non-lead soldering materials such as arsenic were also found in the metal pipe leachate.

Meanwhile, California plumbers are determined to fight use of PVC and other plastics. While plastics producers maintain that plumbers really fear the effects PVC will have on their revenues, as ease of installation leads to increased "do-it-youself" plumbing, the California Pipe Trades Council maintains that public health is its primary concern.

John Gorman, a representative for the group, questions the validity of the McKesson test, citing "lack of forthrightness" on the part of plastics producers in previous tests.

In Leonardini versus Shell Oil Company, a case which came to trial in Sacramento last year, he says, it was found that fittings used to join polybutylene pipes were leaching trioxane, formaldehyde and other carcinogens.

While the plumbing pipe controversy continues in California and the state reviews the McKesson tests, other states have fully approved its use in water pipe.

Some controversy continues to surround PVC's use in electrical cable. The NEC had restricted its use to buildings of three stories and under. Recently, this restriction was removed, a major victory for PVC producers.

The National Institute of Building Sciences has been working to develop new material testing methods which may potentially help PVC, shifting the focus away from toxicity alone to factors equally important in a fire: flame spread and ignitability.

Focusing on toxicity alone is too simplistic an approach, says Gene Brewer, president of NIBS. Although toxicity levels must be considered, he says, materials considered toxic continue to perform best in a fire.

Ruling out potential toxicity destroys other properties which may be equally important in saving lives. Currently, Mr. Brewer says, the Institute is developing one standard evaluation procedure to be used by architects, contractors and interior designers alike.

The National Center for Fire Research and the National Bureau of Standards are close to completing a fire hazard computer model, evaluating not only toxicity but flame spread and other performance factors.

This new approach, says Mr. Gottesman, can only have a positive impact on the vinyl market. Toxicity problems are not being ignored, however. NIBS's Brewer says that material mixes are being evaluated to lower toxicity levels. Several polyolefin producers are also working on developing non-halogenated wire technology.

Cross-linked polyethylene, which is currently being used with ATH in non-halogenated electric cable, specified by the US Navy, has not yet had any sizeable impact on the market.

Although Union Carbide Corporation has developed a line of polyethylene products which, it hopes, may eventually replace PVC in construction, Mr. Gottesman says that it has not yet penetrated the commercial building wire and cable market.

Another remaining snag concerning PVC use in food packaging and bottles has been removed, as the FDA has approved the plastic for food packaging applications (see p. 5). In 1974, vinyl producers first ran into problems when the FDA ruled that the plastic could not be used in liquor bottles. Once new processing techniques were developed, which remove all traces of VCM from food-grade packaging resin, vinyl makers reapplied to FDA for packaging approval.

The comment period of the evaluation process ended in June, but, subsequently, environmental concerns were raised alleging that incineration of PVC would lead to increased dioxin emission levels.

Mr. Gottesman reports that several recent tests have shown that incinerator operating procedure, rather than PVC controls dioxin emission.

Municipal garbage, he says, already emits a certain level of dioxin, most of it from paper, which is treated with chlorine. These tests, he says, prove conclusively that PVC adds only an insignificant amount of dioxin to the total. Although complete FDA approval is still pending, based on these findings, the outlook for the plastic in food applications is good, Gottesman asserts.

In light of strong demand this year and months of depressed pricing earlier, prices for PVC have finally started to firm.

An October price hike was fully successful, moving pipe grade prices to 30 cents per pound. Currently, producers are uniting behind 1 to 2 cents per pound increases which took effect December 1.

Shintech and Formosa were the first to move prices for the resin; since then, B.F. Goodrich, Air Products and Occidental have all posted December 1 increases.

RPR MEDIA PLANNING #2
'86-'87

Dick Conrad (A
VCM

To: Plant managers, communication contacts

From: Jim Rutledge
Date: September 25, 1986

Interoffice Communication

Subject: If-Needed Statement on Air Emissions

This "if-needed" statement has been approved for use in answering media inquiries on air emissions from your plant should the need arise. It contains specific reference information on the major chemicals made or used at Vista's plants, along with approved responses to questions that would likely be encountered during press interviews.

This updated and expanded statement supersedes the material included in the earlier "If-Needed document on Air Emissions," dated Feb. 28, 1986. Please destroy all copies of that document and replace them with the present statement.

Please note that while the actual and permitted emission totals included in this statement are correct as shown, a few of the numbers have "caveats" associated with them--for example, some of the some of the permitted plant emissions are for "new equipment" only. In keeping with the general nature of this document, however, we have chosen not to include this kind of detailed information because it might only cloud the issue for the press.

If you have any questions regarding the attached material or need assistance in responding to a media inquiry, please let me know. Please also continue to keep me advised of all local press calls or contacts.

Thanks for your help.

cc: REL, RTF, JAD, TGG, WLM, DAK, MSR, JCB, DLM

If-Needed Statement

AIR EMISSIONS
All Vista plant locations

Date approved for use: September 18, 1986

Use the following material only in response to specific questions from the media:

Does Vista use or manufacture hazardous chemicals?

Vista Chemical uses and manufactures a number of chemicals in volumes large enough to be of concern in the event of an emergency. However, these chemicals are strictly controlled and monitored. Our plants have been carefully designed and built to handle them safely. Our employees who work with these chemicals have received detailed special training. All of these precautions make an accident which could injure a member of the public extremely unlikely.

Do you routinely release any of these chemicals to the atmosphere?

Yes. Air emissions from our manufacturing processes are regulated by state and federal environmental agencies. These agencies have issued permits to Vista regulating our air emissions. Vista currently operates under 43 different environmental permits which specify allowable air emissions for chemicals ranging from sulfur dioxide and nitrogen oxide, which come from fuel burning processes such as steam generation, to hydrocarbon products. In addition, two compounds produced and used extensively by Vista—benzene and vinyl chloride monomer—are stringently regulated under the Clean Air Act as hazardous air pollutants.

The amount of permitted emissions is generally determined by health effects data and by best available control technologies for our manufacturing processes.

How can you justify releasing these hazardous chemicals, some of which are known cancer-causers, into the atmosphere on a routine basis?

Vista Chemical and the regulating agencies believe that the permitted quantities will not harm the employees who work in our plants or members of the public and the environment nearby.

The chemicals we use, manufacture or which come from our fuel-burning processes are well understood, common chemicals which have been used for years throughout

the industry and which have been studied at length. The effects of exposure to them are well known. Safety and health precautions for properly handling them have been developed, installed and regularly tested at our plants.

Our plants' emissions are controlled so that the concentration of cancer-suspect chemicals in the air in the plants is as low as feasible, typically less than one part per million. With those concentrations in our plants, we know that concentrations in the air further away from our plants are even lower.

Chemicals which have been shown to cause cancer have done so only at relatively high concentrations over long periods of time. Based on the large amount of scientific data available from studies done over the past two decades, low level or short term exposure to these chemicals does not create a hazard. We believe there is a more than adequate margin of safety for our employees and the public.

The amounts of these chemicals routinely released have been greatly reduced over the years, because it makes good business sense and because of more rigorous governmental regulations. We've spent more than $3.2 million in the past five years just to protect the air around all our plants.

Why is it necessary to release chemicals to the atmosphere? Why don't you just make your plants leak-proof?

It's not possible to make a chemical plant 100 percent leak-proof, or to burn fuel without emitting some pollutants. We employ the best available technology and operating procedures to keep emissions at very low levels which are safe for employees and the neighbors of our plants.

Besides the routine emissions to the atmosphere, do you have accidental releases?

Very infrequently. We must immediately report these releases in accordance with the appropriate state or federal regulations. No accidental release of a chemical from a Vista Chemical plant has ever caused a death or serious injury to a member of the public. We've studied the causes of these releases and have made engineering or operational changes to prevent their recurrence.

Why haven't you reported these releases to people in the communities surrounding your plants?

Because the releases have not been of a quantity which would cause injury to the public, and an evacuation of the community has never been required as a result of the releases.

Could such an accidental release lead to a Bhopal-type accident at one of your plants?

Because the chemicals we handle are not as toxic as methyl isocyanate (MIC), and because of the strict controls and procedures we use in our manufacturing processes, we believe that that the possibility of an incident similar to that which happened in Bhopal is very remote. Our plants are well designed and are maintained, inspected and operated by well trained, experienced personnel. In the event of a large gas release, a catastrophic loss of life (such as occurred in Bhopal) is highly unlikely because we do not have any materials as toxic as methyl isocyanate. In addition, we have emergency procedures for dealing with gas leaks if one were to occur and we are working with local authorities to improve procedures for protecting the public in the event of an emergency.

Have you made any changes as a result of Bhopal?

Due to the extent of the tragedy at Bhopal, we instituted a formal program to reassess our existing safety systems and emergency procedures. This assessment included a study of materials present in the plant, our handling, processing and storage of those materials, employee training and emergency response procedures. We wanted to be certain that we are operating our plants in a manner that is safe and which will prevent any tragedy from occurring in our plant communities.

We've also broadened our studies to include the surrounding communities. Our work at our Lake Charles plants is a good example. We have joined together with other local industry members as well as medical, governmental, police and fire agencies in a committee to improve our communication and understanding. That committee is examining such topics as availability of emergency medical care, a direct public warning system and evacuation routes which might be needed in the unlikely event of a major catastrophe.

What sort of warning system or evacuation procedure do you have for the public?

Current procedures call for alerting and providing assistance to local authorities who have the authority to handle evacuation in the event of a disaster. At our Lake Charles complex, we are connected by special phone lines with other major plants and governmental agencies in the area, so that we can warn or be warned of emergencies. More direct methods of notifying people in the surround communities are being studied.

Which chemicals listed by the EPA, or otherwise classified as acutely toxic, does Vista Chemical use or manufacture?

1. **Chlorine** is used as a feedstock at our Lake Charles VCM Plant and the Baltimore LAB (linear alkylbenzene) Plant.
2. **Ethylene oxide** is used as a feedstock at our Lake Charles Chemical Plant
3. **Hydrogen fluoride** is used as a catalyst at our Lake Charles LAB Plant
4. **Sulfur trioxide** is used as a feedstock at our Hammond Premium Sulfonation Plant.
5. **Hydrogen chloride** is used as a feedstock at our Lake Charles Chemical Plant and at our Lake Charles VCM (vinyl chloride monomer) Plant. Muriatic acid, its liquid form, is manufactured at our Baltimore LAB Plant; a small amount is also produced in our VCM Plant incinerator unit.

In addition, we use or manufacture much smaller quantities of:

1. **Sulfur dioxide**
2. **Nitric acid**
3. **Sulfuric acid**
4. **Isopropanol (isopropyl alcohol)**
5. **Methanol (methyl alcohol)** [See reference section for more detail.]

Which of the chemicals you use or manufacture are volatile organic compounds?

1. **Ethylene dichloride** (EDC) and
2. **Vinyl chloride monomer** (VCM) are made at our Lake Charles VCM Plant. VCM is also used as a feedstock at our Aberdeen and Oklahoma City PVC plants.

3. **Benzene** is a feedstock at our Baltimore and Lake Charles LAB plants, and a byproduct containing benzene is manufactured at our Lake Charles Chemical Plant.
4. **Methyl chloride** is manufactured at our Lake Charles Chemical Plant.
5. **Ethylene oxide** is used as a feedstock at our Lake Charles Chemical Plant.
6. **Ethylene** is manufactured at our Lake Charles Chemical Plant and is used as a feedstock at that plant and at the Lake Charles VCM Plant.
7. **Butadiene** is manufactured as a byproduct at our Lake Charles Chemical Plant.
8. **Propylene** is manufactured as a byproduct at our Lake Charles Chemical Plant.
9. **Various light alcohols**, such as butanol, are manufactured at our Lake Charles Chemical Plant.

In addition, we use or manufacture much smaller quantities of:

1. **Methanol** (methyl alcohol)
2. **Toluene**
3. **Xylene**
4. **Chloroform**
5. **Isopropanol** (isopropyl alcohol) [See reference section for more detail.]

What do you do about tiny leaks, ones that are so small that even people working in the plant would not notice?

We have a system of fixed point monitors in our plants to detect quantities of the of the most hazardous VOCs in the air as small as one part per million, or less. When these chemicals are detected, an operator is notified. Then, employees using portable detection equipment can pinpoint the leak and repair it.

What chemicals are produced by your fuel-burning processes?

1. **Particulates** are emitted at all of our plants, except Hammond.
2. **Sulfur oxides** (SO_x) is emitted by all of our plants.
3. **Nitrogen oxide** (NO_x) is emitted by all of our plants, except Hammond.
4. **Carbon monoxide** is emitted by all of our plants, except Hammond.

Reference

--Tonnages of actual emissions

Chemical	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
Nitrogen oxides (NO_x)			
Aberdeen	49.8	–	–
Baltimore	109.4	unregulated	state regs.
LCCP	854	3522.5	state permit
LCLAB	54.6	83.60	fed. permit
LCVCM	204	198.5	state permit
OKC	16.51	22.0	state regs.
TOTAL	**1,288.31**	**3,826.60**	–
Hydrocarbons			
Aberdeen	5.7	–	–
Baltimore	14.9	–	–
Benzene	11.3	–	–
Toluene/xylene	22.1	–	–
Chlorinated	1.4	–	–
Others	14.9	–	–
Baltimore, total	49.7	149.7 total hydrocarbons	fed. permit
LCCP			
Benzene	8	–	–
1,3-Butadiene	1	–	–
Ethylene oxide	4	–	–
Propylene	2	–	–
Toluene	7	–	–
Others	934	1132	state permit
LCCP, total	956	1132	–
LCLAB			
Benzene	1.58	–	–
Other	5.43	–	–
LCLAB, total	7.01	8.46 total combined hydrocarbons	fed. permit
LCVCM			
Ethylene dichloride	0.82	1.06	state permit
Chlorinated, other than VCM	0.07	0.09	state permit
Other	12.82	16.65	state permit
LCVCM, total	13.71	17.80	–
Oklahoma City	0.34	–	–
TOTAL	**1,026.76**	**1,307.96**	–

VOC = volatile organic compound.

Chemical	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
Sulfur oxides (SO_x)			
Aberdeen	0.2	1752	state regs.
Baltimore	259.2	unregulated	state regs.
Hammond	0.73	12	state regs.
LCCP	51	5673.7	state permit
LCLAB	0.43	16.28	fed. permit
LCVCM	0.438	12.88	state permit
OKC	≤0.07	22	state regs.
TOTAL	**312.01**	**7,488.86**	–
Carbon Monoxide			
Aberdeen	5.7		
Baltimore	9.1	91.25	state regs.
LCCP	186	326.8	state permit
LCLAB	0.15	17.3	fed. permit
LCVCM	3	9.39	state permit
OKC	1.87	unregulated	state regs.
TOTAL	**205.82**	**444.74**	–
Particulates			
Aberdeen	2.3	157	state regs.
Baltimore	20.3	-	state regs.
LCCP	98	1030.6	state permit
LCLAB	6.7	14.39	fed. permit
LCVCM	62.4	79.65	state permit
OKC	23.3	386.6	state regs.
TOTAL	**213.0**	**1,668.24**	–
Vinyl chloride monomer			
Aberdeen	40	97	fed. reg.
OKC	31.5	53.04	fed. reg.
LCVCM	4.23	11.09	state, fed. regs. & state permit
TOTAL	**75.73**	**161.13**	–
Hydrogen chloride (HCl or muriatic acid)			
LCCP	0	3.6	state permit
LCVCM	12	12.41	state permit
OKC	0.043	–	
TOTAL	**12.043**	**16.01**	–
H_2SO_4 mist			
Hammond	0.01	2.6	state regs.

VOC = volatile organic compound.

Reference --Combustion products

Particulates

Plant	Actual emissions based on natural gas (tons per year)	Permitted emissions (tons per year)	Basis
Aberdeen	2.3	157	state regs.
Baltimore	20.3	-	state regs.
LCCP	98	1030.6	state permit
LCLAB	6.7	14.39	fed. permit
LCVCM	63.42	79.65	state permit
OKC	0.8	38.5	state regs.
TOTAL	**191.52**	**1,320.14**	-

Primarily carbon particles from incomplete fuel combustion, but also includes ash, sand or dirt. **NOTE:** The permitted numbers listed above are for fuel oil. The actual emissions are from natural gas.

Sulfur oxides (SO_x)

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
Aberdeen	0.2	1752	state regs.
Baltimore	259.2	unregulated	state regs.
Hammond	0.73	12	state regs.
LCCP	51	5673.7	state permit
LCLAB	.43	16.28	fed. permit
LCVCM	0.38	12.88	state permit
OKC	0.07	22	state regs.
TOTAL	**311.83**	**7,488.86**	-

Major component is sulfur dioxide. Other components may include sulfur trioxide.

Sulfur dioxide (SO_2) is a colorless, nonflammable gas with a strong suffocating odor. It dissolves in water to form weak but corrosive sulfurous acid. This mist is odorless, but is very irritating at low concentrations. Because it is intensely irritating, you would not remain voluntarily in dangerous concentrations. Exposure to high levels can damage tissues in the respiratory system. Lung damage resulting from severe exposures could be fatal. **EPA 402**

Sulfur trioxide (SO_3) is a colorless, fuming liquid that reacts with moisture in the air to form a visible sulfuric acid mist. This mist is odorless, but is very irritating at low

VOC = volatile organic compound. **EPA 402** = chemical classified by EPA as one which could produce acute adverse health if accidentally released.

concentrations. Because it is intensely irritating, you would not remain voluntarily in dangerous concentrations. Exposure to high levels can damage tissues in the respiratory system. Lung damage resulting from severe exposures could be fatal. EPA 402

Nitrogen oxides (NO_x)

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
Aberdeen	49.8	–	–
Baltimore	109.4	unregulated	state regs.
LCCP	854	3522.5	state permit
LCLAB	54.6	83.60	fed. permit
LCVCM	204	194.7	state permit
OKC	16.51	22.0	state regs.
TOTAL	1,288.31	3,822.80	–

Primarily nitrogen dioxide, a yellow-brown fuming liquid or a reddish-brown gas with a pungent acrid odor at detectable levels. Exposure to high levels can damage tissues in the respiratory system. Lung damage resulting from severe exposures could be fatal.

Carbon monoxide

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
Aberdeen	5.7	–	–
Baltimore	9.1	91.25	state regs.
LCCP	186	326.8	state permit
LCLAB	0.15	17.3	fed. permit
LCVCM	8.5	9.39	state permit
OKC	1.87	unregulated	state regs.
TOTAL	211.32	444.74	

Carbon monoxide (CO) is a colorless, odorless gas. The toxic effect of high concentrations is oxygen starvation of the body's cells. CO effects are considered to be reversible as long as brain damage or heart failure has not occurred.

VOC = volatile organic compound. EPA 402 = chemical classified by EPA as one which could produce acute adverse health if accidentally released.

Reference

--Major use or manufacture

Chlorine

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
LCVCM	9.6	-	-

Chlorine is a major feedstock at our Lake Charles VCM Plant, arriving by pipeline or rail tank car. We use it to make vinyl chloride monomer, the major ingredient in polyvinyl chloride (PVC), a plastic with hundreds of uses from vinyl siding and food packaging to plastic pipe and record albums. Chlorine is also used as a feedstock at our Baltimore LAB (linear alkylbenzene) Plant to make a major ingredient in industrial and household cleaning products, such as detergents. Its most common usage is in water treatment plants. Chlorine is a heavy, greenish-yellow gas at normal temperatures and has a pungent, irritating odor which is detectable at very low levels. Because it is intensely irritating, you would not remain voluntarily in dangerous concentrations. Exposure to high concentrations can damage tissues in the respiratory system resulting in breathing difficulties. Severe exposures could be fatal. Chlorine is also present at most of our other plants in cylinder quantities for water treatment purposes. EPA 402

Hydrogen fluoride (HF)

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
LCLAB	0	0	-

Hydrogen fluoride is used as a catalyst at our Lake Charles LAB Plant. It arrives at the plant by truck. We use it to make the chief active ingredient in such products as laundry detergents and dishwashing liquids. It is a colorless fuming liquid which rapidly vaporizes in the atmosphere to a gas, which reacts with moisture in the air to form a visible cloud. HF is very irritating to the skin, eyes and respiratory tract at low concentrations. Exposure to high concentration in air can burn the skin and damage lung tissue. Lung damage resulting from severe exposures could be fatal. EPA 402

VOC = volatile organic compound. EPA 402 = a chemical classified by the EPA as one which could produce acute adverse health effects if accidentally released.

Sulfur trioxide (SO_3)

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
Hammond	0	0	–

Sulfur trioxide is a major feedstock at our Hammond Premium Sulfonation Plant. We use it to make the active ingredients in such products as laundry detergents and dishwashing liquids. It comes to our plant through a pipeline from the Stauffer Chemical plant adjacent to our property. Sulfur trioxide is a colorless, fuming liquid that reacts with moisture in the air to form a visible sulfuric acid mist. This mist is odorless, but is very irritating at low concentrations. Because it is intensely irritating, you would not remain voluntarily in dangerous concentrations. Exposure to high levels can damage tissues in the respiratory system. Lung damage resulting from severe exposures could be fatal. **EPA 402**

Ethylene Oxide (EO)

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
LCCP	4	–	–

Ethylene oxide is a feedstock in the ethoxylation unit at the Lake Charles Chemical Plant. We use it to make ingredients which have a multitude of uses, including cleaning and personal care products. It is shipped to our plant by rail tank car. Ethylene oxide is a highly flammable and reactive gas at room temperature. We handle it under pressure in a liquid form. At high concentrations, it has an ether-like pungent odor and is irritating to the eyes, nose and throat. Exposure to extremely high concentrations may result in lung injury and accumulation of fluid in the lungs and death. It is regulated as a cancer-causing agent. This chemical is highly volatile and disperses rapidly in the atmosphere to low concentrations. Therefore, it is unlikely that hazardous concentrations would be encountered outside the plant boundaries. **EPA 402, VOC**

VOC = volatile organic compound. **EPA 402** = a chemical classified by the EPA as one which could produce acute adverse health effects if accidentally released.

Vinyl chloride monomer (VCM)

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
Aberdeen	40	97	fed. regs.
OKC	31.5	53.04	fed. regs.
LCVCM	4.23	11.09	state, fed. regs & state permit
TOTAL	75.73	161.13	–

Vinyl chloride monomer is produced at our Lake Charles VCM Plant, and is a key feedstock at our Aberdeen and Oklahoma City PVC plants. VCM is shipped from Lake Charles and arrives at Aberdeen and Oklahoma City by rail tank car. We use it to make polyvinyl chloride (PVC), a plastic with hundreds of uses from vinyl siding and food packaging to plastic pipe and record albums. Vinyl chloride monomer (VCM) is a colorless gas and a liquid under pressure. Vapors can form flammable mixtures in air. Burning VCM generates hydrogen chloride (HCl), a strongly irritating gas which, in high concentrations, can damage tissues in the respiratory system. High levels of exposure to VCM over long periods of time can cause cancer in humans. VCM is highly volatile and disperses rapidly in the atmosphere to low concentrations. Therefore, it is unlikely that hazardous concentrations would be encountered outside the plant boundaries. VOC

Benzene

Plant	Actual emissions tons per year	Permitted emissions (tons per year)	Basis
Baltimore	11.3	149.7 total VOCs	State regs.
LCCP	8	–	–
LCLAB	1.58	8.46 total hydrocarbons	fed. permit
TOTAL	20.88	–	–

Benzene is a key feedstock at our Baltimore and Lake Charles LAB plants. We use it to make LAB, the active ingredient in many household and industrial detergents and other cleaning products. It arrives at Baltimore by barge and tank truck, and at Lake Charles by rail tank car and tank truck. In addition, we manufacture a relatively small quantity of benzene in our ethylene unit at the Lake Charles Chemical Plant. Benzene is a clear, colorless liquid with a aromatic odor. It can form explosive and flammable mixtures with air. Overexposure can cause dizziness, nausea, vomiting, unconsciousness. Severe exposure for 15 to 30 minutes may be fatal. High levels of exposure over long periods of time are believed to cause cancer in humans. VOC

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Methyl chloride

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
LCCP	0	98.9	state permit

Methyl chloride is made at our Lake Charles Chemical Plant. It is used by our customers to make products such as synthetic rubber, silicones and refrigerants. It is shipped from our plant by rail tank car. It is a colorless liquid or gas with a faint, ether-like odor and sweet taste. Severe exposures may result in narcotic effects, such as dizziness, and affect other body systems, such as the kidneys, liver and blood. This chemical is highly volatile and disperses rapidly in the atmosphere to low concentrations. Therefore, it is unlikely that hazardous concentrations would be encountered outside the plant boundaries. **VOC**

Ethylene dichloride

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
LCVCM	0.86	1.06	state permit

Ethylene dichloride (EDC) is manufactured at our Lake Charles VCM (vinyl chloride monomer) plant. We use it to make VCM, the key ingredient in a common plastic, PVC (polyvinyl chloride). We use it on site and do not routinely ship any outside the plant. After it is made, it is held in tanks until it is needed in the VCM manufacturing process. It is a colorless, oily liquid with a chloroform-like odor. High exposure can cause intoxication, nausea, vomiting and depression of the central nervous system. Severe exposures may affect other body systems such as the kidneys and liver. The National Institute for Occupational Safety and Health has recommended that it be handled in the workplace as if it were a carcinogen in man. **VOC**

Hydrogen chloride (muriatic acid)

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
LCCP	0	3.6	state permit
LCVCM	12	12.41	state permit
OKC	0.043	–	
TOTAL	**12.043**	**16.01**	–

Hydrogen chloride (HCl) is used at our Lake Charles Chemical Plant to manufacture methyl chloride, an ingredient in such products as synthetic rubber, silicones and re-

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frigerants. Mixed with water, it forms muriatic acid. The Lake Charles VCM Plant uses HCl in the production of vinyl chloride monomer (VCM), and also produces medium strength (15-22%) muriatic acid in its incinerator unit. Muriatic acid is manufactured at our Baltimore LAB Plant. We ship it from the plant in rubber-lined tank cars. Muriatic acid is used in processing metals and gelatin and making pharmaceuticals and chemicals to develop photographs. Hydrogen chloride is a colorless gas, but reacts with moisture in the air to form a visible cloud. It has an irritating, pungent odor and is detectable at low concentrations. Because it is intensely irritating, you would not remain voluntarily in dangerous concentrations. High exposure can damage tissues in the respiratory system and cause breathing difficulties. With severe exposures, these effects may be fatal.

Ethylene

Plant	Actual emissions tons per year	Permitted emissions (tons per year)	Basis
LCCP	Not measured specifically– 934 total hydrocarbons	Not permitted specifically– 1,132.1 total hydrocarbons	state permit
LCVCM	Not measured specifically– 12.82 total hydrocarbons 0.07 chlor. hydrocarbons	Not permitted specifically– 16.65 total hydrocarbons 0.09 chlor. hydrocarbons	state permit

Ethylene is manufactured at our Lake Charles Chemical Plant and is used as a feedstock at that plant to make industrial alcohols and at the Lake Charles VCM Plant to make VCM, the major ingredient in a common plastic, PVC (polyvinyl chloride). We transfer it by pipeline and do not routinely ship it out of the Lake Charles complex. It is a colorless flammable gas with a sweet odor at high concentrations. It is a simple asphyxiant, meaning that it displaces oxygen in the air. Severe exposure may result in narcotic effects, such as dizziness, progressing to unconsciousness due to lack of oxygen. This chemical is highly volatile and disperses rapidly in the atmosphere to low concentrations. Therefore, it is unlikely that hazardous concentrations would be encountered outside the plant boundaries. VOC

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Alcohols, light

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
LCCP	Not measured specifically– 934 total hydrocarbons	Not permitted specifically– 1,132.1 total hydrocarbons	state permit

Light alcohols, including butanol, ethanol and hexanol are manufactured at our Lake Charles Chemical Plant. We ship them by tank cars, tank trucks and in drums They are used to make various industrial and consumer products including plasticizers (chemicals which make plastics flexible). These are colorless flammable liquids. Exposure to high vapor concentrations may cause irritation to the eyes, nose and throat. Severe exposures will result in narcotic effects, such as dizziness, leading to unconsciousness. VOC

Propylene

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
LCCP	2	–	–

Propylene is manufactured at our Lake Charles Chemical Plant. We ship it by railcar to other chemical manufacturers who use it to make a variety of products, including plastics. It is a colorless flammable gas with a sweet odor at high concentrations. It is a simple asphyxiant, meaning that it displaces oxygen in the air. Severe exposure may result in narcotic effects, such as dizziness, progressing to unconsciousness due to lack of oxygen. This chemical is highly volatile and disperses rapidly in the atmosphere to low concentrations. Therefore, it is unlikely that hazardous concentrations would be encountered outside the plant boundaries. VOC

1,3 Butadiene

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
LCCP	1	–	–

Butadiene is manufactured at our Lake Charles Chemical Plant. We ship it by railcar to other chemical manufacturers who make a variety of products, including synthetic rubber. It is a colorless flammable gas with an aromatic odor. Inhalation of high concentrations is irritating to the eyes, nose and throat. Severe exposures may result in narcotic effects, such as dizziness, leading to unconsciousness. These

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effects could potentially be fatal. Exposure to high concentrations over long periods of time has been shown to cause tumors in laboratory animals. This chemical is highly volatile and disperses rapidly in the atmosphere to low concentrations. Therefore, it is unlikely that hazardous concentrations would be encountered outside the plant boundaries. VOC

Sulfur dioxide (SO_2)

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
Hammond	0.73	12	state permit

Sulfur dioxide (SO2) is a byproduct produced at our Hammond Premium Sulfonation Plant, where we make the active ingredients in such products as laundry detergents and dishwashing liquids. We send the sulfur dioxide through a pipeline to the Stauffer Chemical plant adjacent to our property. It is a colorless, nonflammable gas with a strong suffocating odor. It dissolves in water to form weak but corrosive sulfurous acid. This mist is odorless, but is very irritating at low concentrations. Because it is intensely irritating, you would not remain voluntarily in dangerous concentrations. Exposure to high levels can damage tissues in the respiratory system. Lung damage resulting from severe exposures could be fatal. EPA 402

Methanol (methyl alcohol)

We use methanol as a feedstock at the Lake Charles Chemical Plant to make methyl chloride, an ingredient in synthetic rubber, silicones and refrigerants. It is brought to our plant by barge. It is a clear colorless flammable liquid with an alcohol odor. Overexposure can result in dizziness, visual impairment, nausea, and irritation of the eyes nose and throat. Severe exposures could result in unconsciousness and respiratory failure. EPA 402, VOC

Nitric acid

It is used in small quantities in laboratories or as a process additive at several of our plants. It is a fuming colorless or yellow corrosive liquid. Because it is intensely irritating, you would not remain voluntarily in dangerous concentrations. High xposure can damage tissues in the respiratory system and cause breathing difficulties. With severe exposures, these effects may be fatal. EPA 402

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Sulfuric acid

It is used in small quantities in laboratories or as a process additive or processing aid at several of our plants. It is a dense, oily, colorless, odorless liquid that is strongly corrosive and nonflammable. Because it is intensely irritating, you would not remain voluntarily in dangerous concentrations. High exposure can damage tissues in the respiratory system and cause breathing difficulties. With severe exposures, these effects may be fatal. **EPA 402**

Toluene
Xylene

Plant	Actual emissions (tons per year)	Permitted emissions (tons per year)	Basis
Baltimore	22.1	149.7 total VOCs	state permit
LCCP	7(toluene only)	–	–
TOTAL	**29.1**	–	–

Toluene and xylene are used as feedstocks at our Baltimore LAB Plant to make ingredients for industrial and household detergents. They are clear colorless flammable liquids with an aromatic odor. Exposure to high concentrations can cause irritation of the eyes, nose and throat. Severe exposures may result in unconsciousness and could be fatal. These chemicals are volatile and disperse quickly in the environment to low concentrations. **VOC**

Chloroform

It is inadvertently manufactured in small quantities as a byproduct at our Lake Charles VCM Plant and is used in small quantities as a laboratory solvent in several of our plants. It is a clear, nonflammable sweet smelling liquid. High exposures to chloroform may cause headache, dizziness and unconsciousness. Severe exposures may result in kidney and liver damage. **EPA 402**

Isopropanol (isopropyl alcohol)

It is used in laboratory quantities at several of our plants. A clear colorless flammable liquid with an alcohol odor. Exposure to high vapor concentrations may cause irritation to the eyes, nose and throat. Severe exposures will result in narcotic effects, such as dizziness, leading to unconsciousness. **EPA 402, VOC**

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RAE

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If-Needed Statement
AIR EMISSIONS
All Vista plant locations

Date approved for use: [Draft as of 5/13/86]

Air
Borne to
Reynolds 7/2/86

Use the following material only in response to specific questions from the media:

Check against final issue

Does Vista use or manufacture hazardous chemicals?

Vista Chemical uses and manufactures a number of chemicals in volumes large enough to be of concern in the event of an emergency. However, these chemicals are strictly controlled and monitored. Our plants have been carefully designed and built to handle them safely. Our employees who work with these chemicals have received detailed special training. All of these precautions make an accident which could injure a member of the public extremely unlikely.

Do you routinely release any of these chemicals to the atmosphere?

Yes. Air emissions from our manufacturing processes are regulated by state and federal environmental agencies. These agencies have issued permits to Vista regulating our air emissions. Vista currently operates under 43 different environmental permits which specify allowable air emissions for chemicals ranging from sulfur dioxide and nitrogen oxide, which come from fuel burning processes such as steam generation, to hydrocarbon products. In addition, two compounds produced and used extensively by Vista–benzene and vinyl chloride monomer–are stringently regulated under the Clean Air Act as hazardous air pollutants.

The amount of permitted emissions is generally determined by health effects data and by best available control technologies for our manufacturing processes.

How can you justify releasing these hazardous chemicals, some which are known cancer-causers, into the atmosphere on a routine basis?

Vista Chemical and the regulating agencies believe that the permitted quantities will not harm the employees who work in our plants or members of the public and the environment nearby.

The chemicals we use, manufacture or which come from our fuel-burning processes are well understood, common chemicals which have been used for years throughout the industry and which have been studied at length. The effects of exposure to them are well known. Safety and health precautions for properly handling them have been developed, installed and regularly tested at our plants.

Our plants' emissions are controlled so that the concentration of cancer-suspect chemicals in the air in the plants is as low as feasible, typically less than one part per million. With those concentrations in our plants, we know the concentrations in the air further away from our plants are even lower.

Chemicals which have been shown to cause cancer have done so only at relatively high concentrations over long periods of time. Based on the large amount of scientific data available from studies done over the past two decades, low level or short term exposure to these chemicals does not create a hazard. We believe there is a more than adequate margin of safety for our employees and the public.

The amounts of these chemicals routinely released have been greatly reduced over the years, because it makes good business sense and because of more rigorous governmental regulations. We've spent more than $3.2 million in the past five years just to protect the air around all our plants.

Why is it necessary to release chemicals to the atmosphere? Why don't you just make your plants leak-proof?

It's not possible to make a chemical plant 100 percent leakproof, or to burn fuel without emitting some pollutants. We employ the best available technology and operating procedures to keep emissions at very low levels which are safe for employees and the neighbors of our plants.

Besides the routine emissions to the atmosphere, do you have accidental releases?

Very infrequently. We must immediately report these releases in accordance with the appropriate state or federal regulations. No accidental release of a chemical from a Vista Chemical plant has ever caused a death or serious injury to a member of the public. We've studied the causes of these releases and have made engineering or operational changes to prevent their recurrence.

Why haven't you reported these releases to people in the communities surrounding your plants?

Because the releases have not been of a quantity which would cause injury to the public, and an evacuation of the community has never been required as a result of the releases.

Could such an accidental release lead to a Bhopal-type accident at one of your plants?

Because the chemicals we handle are not as toxic as methyl isocyanate (MIC), and because of the strict controls and procedures we use in our manufacturing processes, we believe that that the possibility of an incident similar to that which happened in Bhopal is very remote. Our plants are well-designed and are maintained, inspected and operated by well-trained, experienced personnel. In the event of a large gas release, a catastrophic loss of life (such as occurred in Bhopal) is highly unlikely because we do not have any materials as toxic as methyl isocyanate. In addition, we have emergency procedures for dealing with gas leaks if one were to occur and we are working with local authorities to improve procedures for protecting the public in the event of an emergency.

Have you made any changes as a result of Bhopal?

Due to the extent of the tragedy at Bhopal, we instituted a formal program to reassess our existing safety systems and emergency procedures. This assessment included a study of materials present in the plant, our handling, processing and storage of those materials, employee training and emergency response procedures. We wanted to be certain that we are operating our plants in a manner that is safe and which will prevent any tragedy from occurring in our plant communities.

We've also broadened our studies to include the surrounding communities. Our work at our Lake Charles plants is a good example. We have joined together with other local industry members as well as medical, governmental, police and fire agencies in a committee to improve our communication and understanding. That committee is examining such topics as availability of emergency medical care, a

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direct public warning system and evacuation routes which might be needed in the unlikely event of a major catastrophe.

What sort of warning system or evacuation procedure do you have for the public?

Current procedures call for alerting and providing assistance to local authorities who have the authority to handle evacuation in the event of a disaster. At our Lake Charles complex, we are connected by special phones with other major plants and governmental agencies in the area, so that we can warn or be warned of emergencies. More direct methods of notifying people in the surround communities are being studied.

Which chemicals listed by the EPA, or otherwise classified as acutely toxic, does Vista Chemical use or manufacture?

1. **Chlorine** is used as a feedstock at our Lake Charles VCM Plant and the Baltimore, Maryland, LAB (linear alkylbenzene) Plant.
2. **Ethylene oxide** is used as a feedstock at our Lake Charles Chemical Plant
3. **Hydrogen fluoride** is used as a catalyst at our Lake Charles LAB Plant
4. **Sulfur trioxide** is used as a feedstock at our Hammond, Indiana, Premium Sulfonation Plant.
5. **Hydrogen chloride** is used as a feedstock at our Lake Charles Chemical Plant and at our Lake Charles VCM (vinyl chloride monomer) Plant. Muriatic acid, its liquid form, is manufactured at our Baltimore, Maryland, LAB (linear alkylbenzene) Plant; a small amount is also produced in our VCM Plant incinerator unit.

In addition, we use or manufacture much smaller quantities of:

1. **Sulfur dioxide**
2. **Nitric acid**
3. **Sulfuric acid**
4. **Isopropanol (Isopropyl alcohol)**
5. **Methanol (methyl alcohol)** [See reference section for more detail.]
6. Carbon Tetrachloride

one (1) change

Which of the chemicals you use or manufacture are volatile organic compounds?

1. **Ethylene dichloride** (EDC) and
2. **Vinyl chloride monomer** (VCM) are made at our Lake Charles VCM Plant. VCM is also used as a feedstock at our Aberdeen, Mississippi, and Oklahoma City, Oklahoma, PVC plants.
3. **Benzene** is a feedstock at our Baltimore, Maryland, and Lake Charles LAB (linear alkylbenzene) plants, and a byproduct containing benzene is manufactured at our Lake Charles Chemical Plant.
4. **Methyl chloride** is manufactured at our Lake Charles Chemical Plant.
5. **Ethylene oxide** is used as a feedstock at our Lake Charles Chemical Plant.
6. **Ethylene** is manufactured at our Lake Charles Chemical Plant and is used as a feedstock at that plant and at the Lake Charles VCM Plant.
7. **Butadiene** is manufactured as a byproduct at our Lake Charles Chemical Plant.
8. **Propylene** is manufactured as a byproduct at our Lake Charles Chemical Plant.
9. **Various light alcohols**, such as butanol, are manufactured at our Lake Charles Chemical Plant.

In addition, we use or manufacture much smaller quantities of:

1. **Methanol** (methyl alcohol)
2. **Toluene**
3. **Xylene**
4. **Chloroform**
5. **Isopropanol** (Isopropyl alcohol) [See reference section for more detail.]

6. Carbon Tetrachloride

What do you do ~~about tiny leaks,~~ ones that are so small that even people working in the plant would not notice?

We have a system of fixed point monitors in our plants to detect quantities of the of the most hazardous VOCs in the air as small as one part per million, or less. When these chemicals are detected, an operator is notified. Then, employees using portable detection equipment can pinpoint the leak and repair it.

me (1) Change

What chemicals are produced by your fuel-burning processes?

1. **Particulates** are emitted at all of our plants, except Hammond.
2. **Sulfur oxides** or SO_x is emitted by all seven of our plants.
3. **Nitrogen oxide** or NO_x is emitted by all of our plants, except Hammond.
4. **Carbon monoxide** is emitted by all of our plants, except Hammond.

SO_x
NO_x

two (2) changes