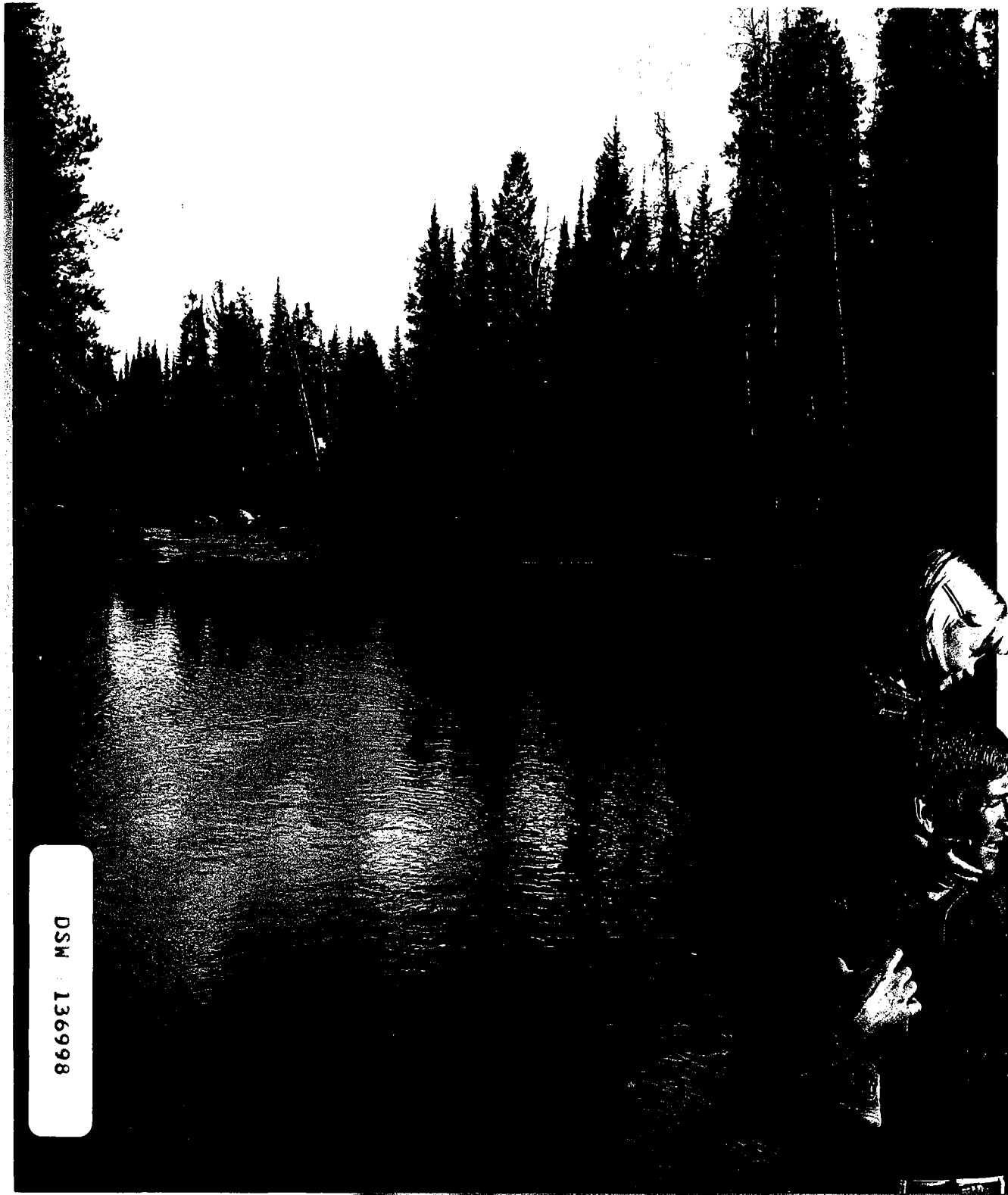
A clean environment in our modern world.

Is it possible?

DSW 136997



At Monsanto, we believe it is possible to manufacture chemicals that help enrich our lives, without harm to the environment.

In fact that's what we strive to do every day, and we're getting better at it. It's the essence of "The Monsanto Pledge."

The inception of the Monsanto Pledge was our company's commitment to voluntarily reduce toxic air emissions,* worldwide, by 90 percent by the end of 1992. When that milestone is reached, we will work toward the ultimate goal of zero emissions.



*The baseline for reduction is the Monsanto 1987 air emissions reported required under the federal Superfund Amendments and Reauthorization Act (SARA, Title III)

DSM 136998

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OUR PLEDGE

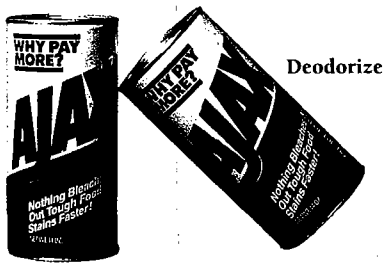
Monsanto Chemical Company, of which we are a part, has also pledged to reduce wastes released to the environment by 70 percent by the end of 1995, with the top priority being not making the waste in the first place.

But the Monsanto Pledge goes well beyond those benchmarks. Because anything short of working toward zero effect on the environment—in everything we do—is simply not acceptable to us, or to you.

In Sauget, Illinois, the people of the Monsanto William G. Krummrich Plant are making a significant contribution toward meeting the company's voluntary reduction goals. The public grants us the right to operate in their communities. At Krummrich we pledge to work very hard to earn that right every day.

At Krummrich, our job is to make chemicals for people without harm to the environment.

You will find our chemicals in products that:



Deodorize and clean homes



Keep farm animals healthy

Help farmers produce our food



Remove weeds safely



Make motor oils non-corrosive

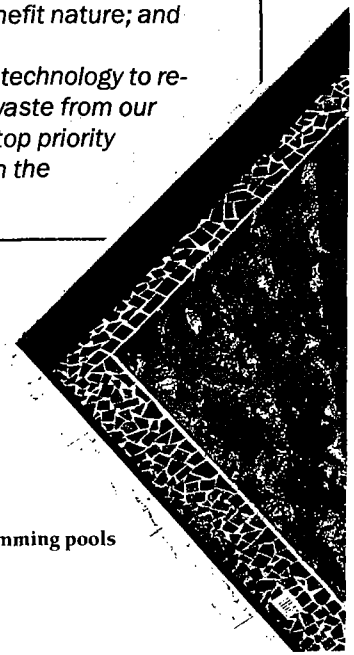
Make glass shatterproof





Provide pain relief

Add long life to tires



Disinfect swimming pools

The Monsanto Pledge

It is our pledge to:

- *reduce all toxic and hazardous releases and emissions, working toward an ultimate goal of zero effect;*
- *ensure no Monsanto operation poses any undue risk to our employees and our communities;*
- *work to achieve sustainable agriculture through new technology and practices;*
- *ensure groundwater safety;*
- *keep our plants open to our communities and involve the community in plant operations;*
- *manage all corporate real estate, including plant sites, to benefit nature; and*
- *search worldwide for technology to reduce and eliminate waste from our operations, with the top priority being not making it in the first place.*

DSM 136999

STLCOPCB4036958

OUR VISION

Our vision simply put: We want to be the best. We envision Krummrich as a plant that sets the standard in the industry for what a chemical plant should be. The first thing a chemical plant should be is *safe*. That means no spills to the environment and no injuries to our workers.

W. G. Krummrich Plant Vision

The W. G. Krummrich Plant will be the standard of excellence for manufacturing in the global chemical industry. Our employees will reflect that excellence through world-class performance by:

- ***Working injury and incident-free***
- *Satisfying customer needs*
- *Implementing leading edge technology*
- *Meeting public expectations*
- *Achieving financial performance targets*

Realizing our vision will allow us to survive and prosper in the dynamic business world.

No Spills

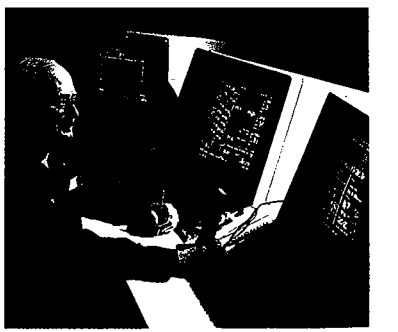


Our PCl3 team is determined to "have no spills." From left are Bernie Love, mechanic; Jim Champion, business unit leader; Gus Anderson, unit controller; and Marie Allen, process engineer.

Keeping chemicals in the equipment—where they belong—takes constant attention to detail. At Krummrich we routinely inspect, maintain and upgrade every piece of equipment, from standard valves to sophisticated computer controls, to eliminate the causes of spills.

We have also set high standards for ourselves that go beyond compliance with federal, state and local reporting requirements. We have a strict internal reporting program so we can track our progress and correct minor problems before they become big problems.

Past mistakes are being rectified too. When an emission resulted from an overflowing tank car in our phosphorus trichloride (PCl3) department, we revised operating procedures, redesigned



People will always be the first line of defense in preventing spills, no matter how sophisticated technology becomes. At the controls of his department computer system is Leo Fulbright, chlorobenzenes operator.

DSM 137000

STLCOPCB4036959

our handling of raw materials and finished product into a completely contained system that is now being built, and retrained operators and mechanics. The department has operated incident-free for almost two years. Our PCl3 team is determined to keep it that way.

No Injuries

Most people do not realize that the chemical industry is one of the safest industries in which to work. In our business, we take safety seriously. We handle some formidable chemicals, some of which are processed under high heat and pressure. These chemicals demand our respect. Safety *must* be our first priority at all times—and it is.

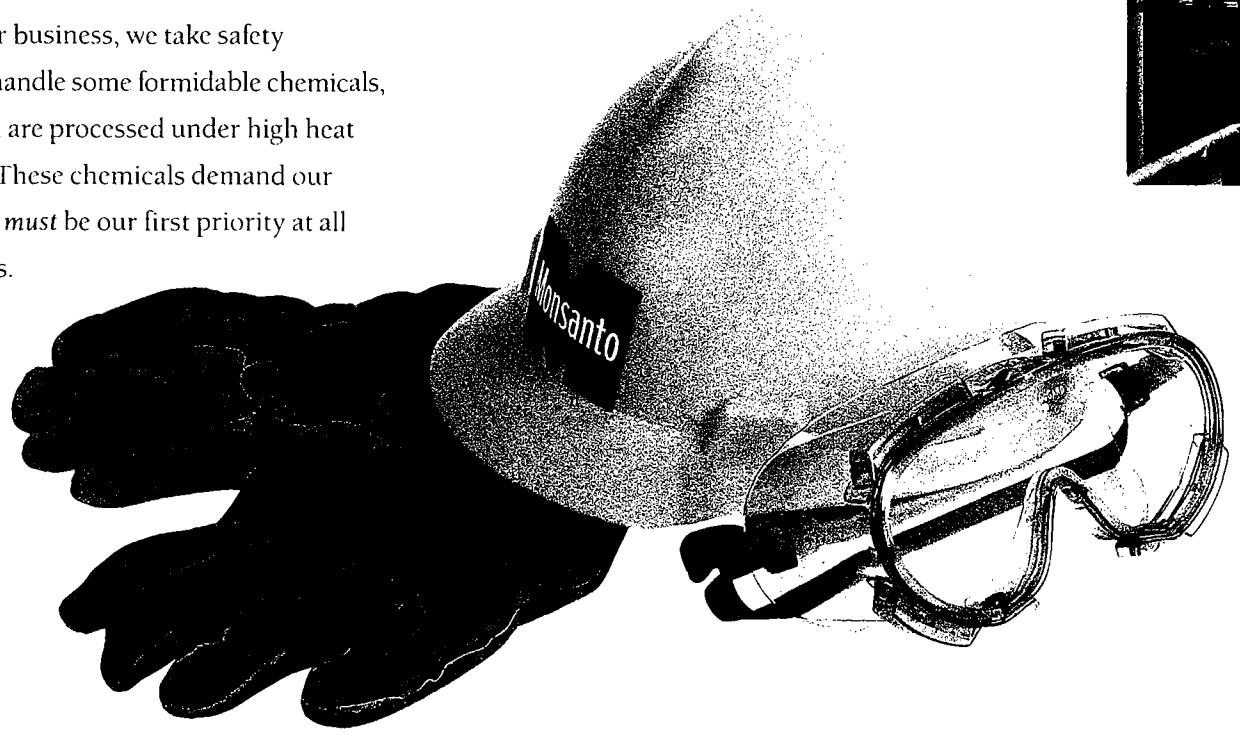
Our target is zero injuries. We're not perfect yet, but our safety record is steadily improving. Over the past four years plant injuries have decreased by more than 40 percent.

Our safety program works because it isn't top-down management. Krummrich employees take personal responsibility for an injury-free workplace. At Krummrich everyone follows the same credo, "If you can't do it safely, don't do it."

With the leadership of ICWU Local 12 and AFPO Local 19, our employees keep safety the *number one priority*, so they can leave the plant each day the same way they entered it—injury-free.



Safety equipment is routinely checked on department walk-throughs. First Line Supervisors Dennis Schildroth (left) and Duke Hinrichs make sure their department safety showers work the first time, every time.



DSW 137001

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REDUCE, RECOVER AND RECYCLE



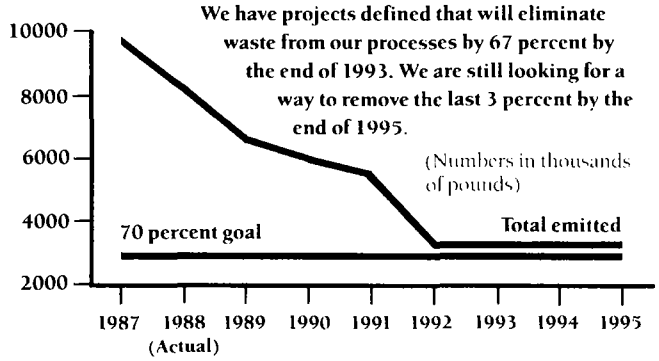
Everything on earth is made of chemicals, even this flower.

Long ago man discovered he could use, change and combine the chemicals in nature to make things people need and want.

He soon realized that creating useful products from chemicals also produced waste, such as byproducts, gases and residues. The problem man has faced since creating his first chemical reaction—fire—has been what to do with the waste.

That problem still exists in the chemical industry today. Through the years Monsanto engineers have made steady progress in improving our processes to make chemicals safely while minimizing waste discharged to the environment. The Krummrich plant, for example, produces 500 million pounds of chemicals each year; SARA, Title III air emissions are less than 1 percent of production.

But we are not satisfied even with this level of performance. Our engineers are searching worldwide for new technologies—some that are on the leading edge, others that are on the brink of discovery—to manufacture products people want without the waste.



W. G. Krummrich Plant
70 Percent Waste Elimination Goal
by year-end 1995*
Organic and Toxic Wastes

***includes 90 percent reduction of toxic air emissions**



Hierarchy of Waste Elimination

Waste Elimination

It's not what you say that counts, it's what you do

To attain our waste elimination goals, Krummrich knows where it is going and how to get there When we reach those benchmarks, we'll continue striving for zero releases to the environment.

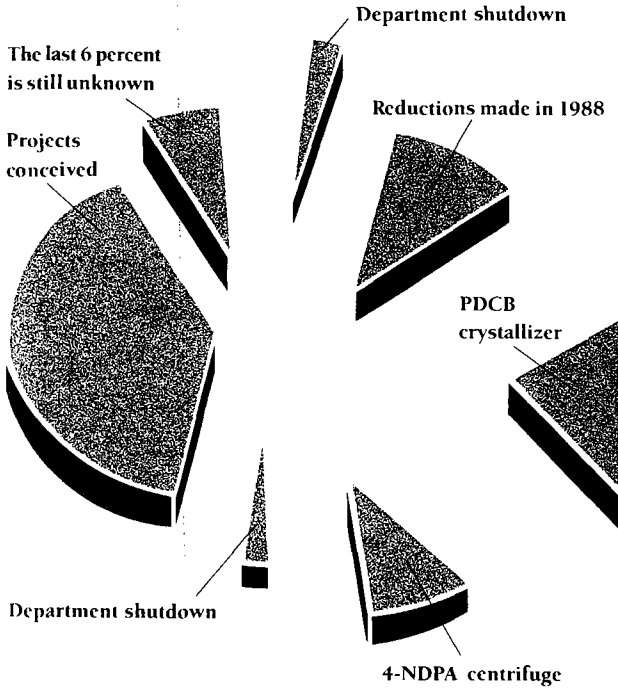
Air

Air emissions from a manufacturing process can be compared to an automobile exhaust system: what goes in (gasoline, for example) must come out.

DSM 137002
STLCOPCB4036961

REDUCE, RECOVER AND RECYCLE

In a chemical plant, air emissions come from several sources: *process equipment,* where vapors are vented off to keep pressure from building up; *fugitives,* in which trace amounts of material are lost through piping systems and valves; and *stacks*, such as vents that equalize storage tank pressure. Pollution control equipment is used to keep air emissions in check.



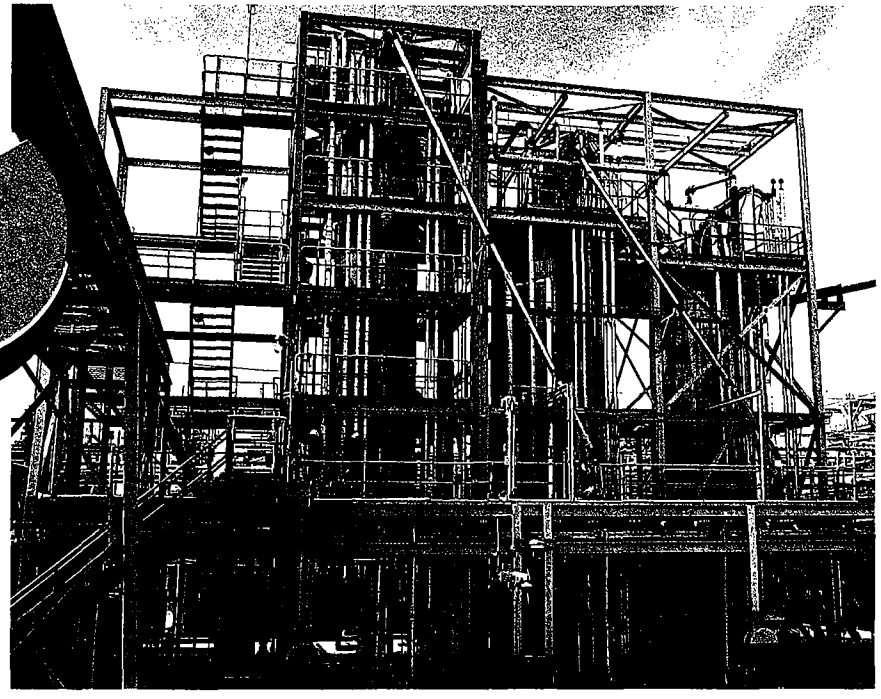
W. G. Krummrich Plant
90 Percent Toxic Air Emission Reduction Goal by year-end 1992

Other ways we reduce air emissions:

- Eliminating leaks from equipment where fugitive emissions occur.
- Replacing equipment, like the centrifuge in our 4-NDPA operation, to better contain the chemicals.
- Installing new seals on tanks to reduce the space for vapors to escape.

Land

For routine process waste that can't be sewered, it has been our longtime practice at Krummrich to incinerate rather than landfill the material. We choose to eliminate the waste, even though regulations would have allowed us to do otherwise.



A significant piece of the 90 percent reduction pie is our new paradichlorobenzene (PDCB) crystallizer process, which has eliminated 1 million pounds of material from our air and wastewater discharges. Krummrich has the only process of its kind in the United States.

The operation is self-contained and virtually eliminates emissions to the environment. The final product is a liquid, which is loaded directly from the process into tank cars, thus reducing vapor releases even further.

DSM 137003
STLCOPCB4036962

REDUCE, RECOVER AND RECYCLE





Ed Heumann, environmental technician, routinely samples plant wastewater to track our compliance with federal regulations.

Water

Water is an important "chemical" in chemical manufacturing. It is used:

- as a carrier for chemical reactants,
- in scrubbers for air emission control,
- for equipment cleaning and housekeeping,
- in purification operations to remove reaction byproducts,
- and as a wash in cooling towers.

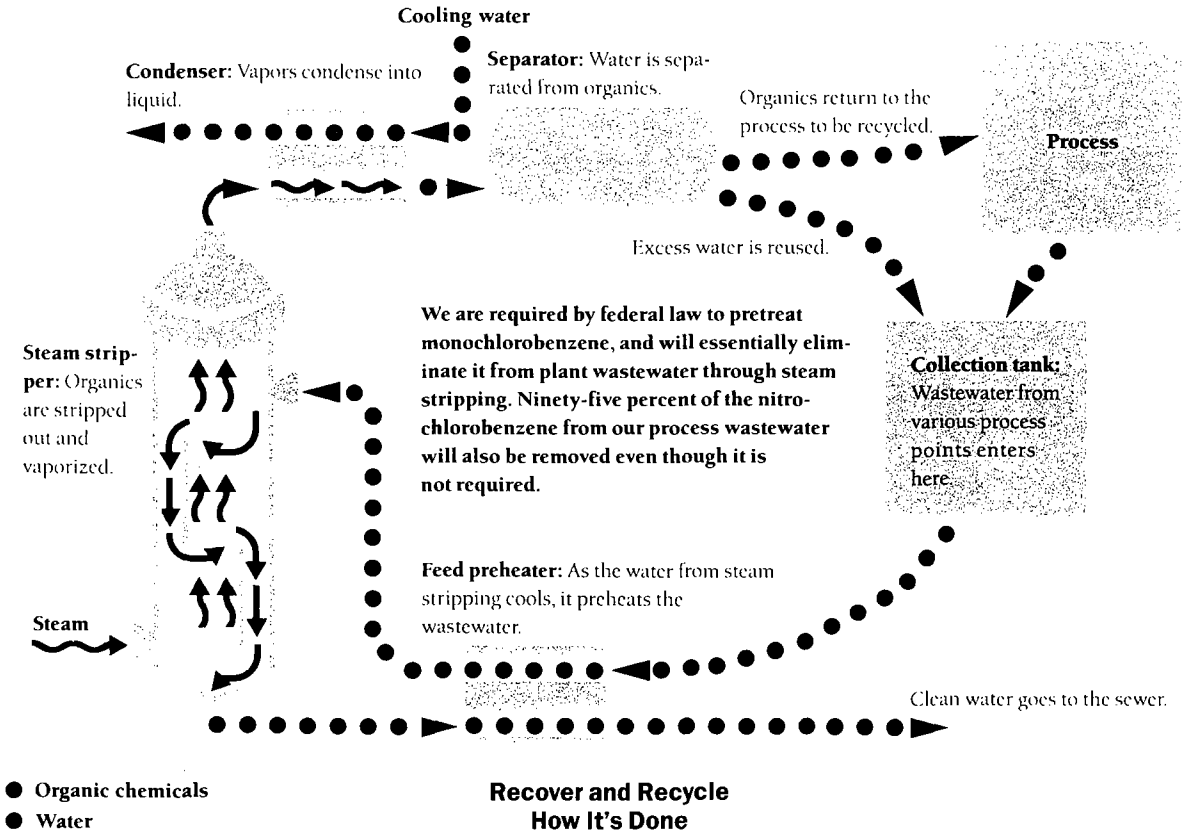
The water that goes to the sewer has some amount of chemicals.

Each day approximately 4 million gallons of wastewater leave the Krummrich plant for off-site treatment. Acids are neutralized and solids and heavy metals are removed at the Sauget Physical-Chemical Primary Treatment Plant. The wastewater then flows to the American Bottoms Regional Wastewater Treatment Plant, where organic chemicals are removed.

In November 1990, plant wastewater will be significantly cleaner through a massive on-site pretreatment program. The program will remove from our wastewater 11 organic chemicals targeted by new federal regulations, plus reduce 6 additional organic chemicals and ammonia

DSM 137004

STLCOPCB4036963



Recover and Recycle
How It's Done

Pretreatment Steam Stripping

Pretreatment is the largest engineering effort ever undertaken at the Krummrich plant.

The construction involves:

- *1200 engineering drawings*
- *640 new instruments*
- *150 trucks of concrete*
- *71 miles of new wire and cable*
- *80 new tanks, pumps and heat exchangers*
- *5 miles of pipe*

The focus of pretreatment is to recover and recycle chemicals where possible. We're making every effort to return potential waste to the manufacturing processes instead of sending it down the sewer.

Carbon columns will be used in some Krummrich departments as a final step to remove ultra trace amounts of organics from our wastewater. Once the carbon is saturated, it is sent off-site where the chemicals are removed through incineration. The carbon can then be reused.

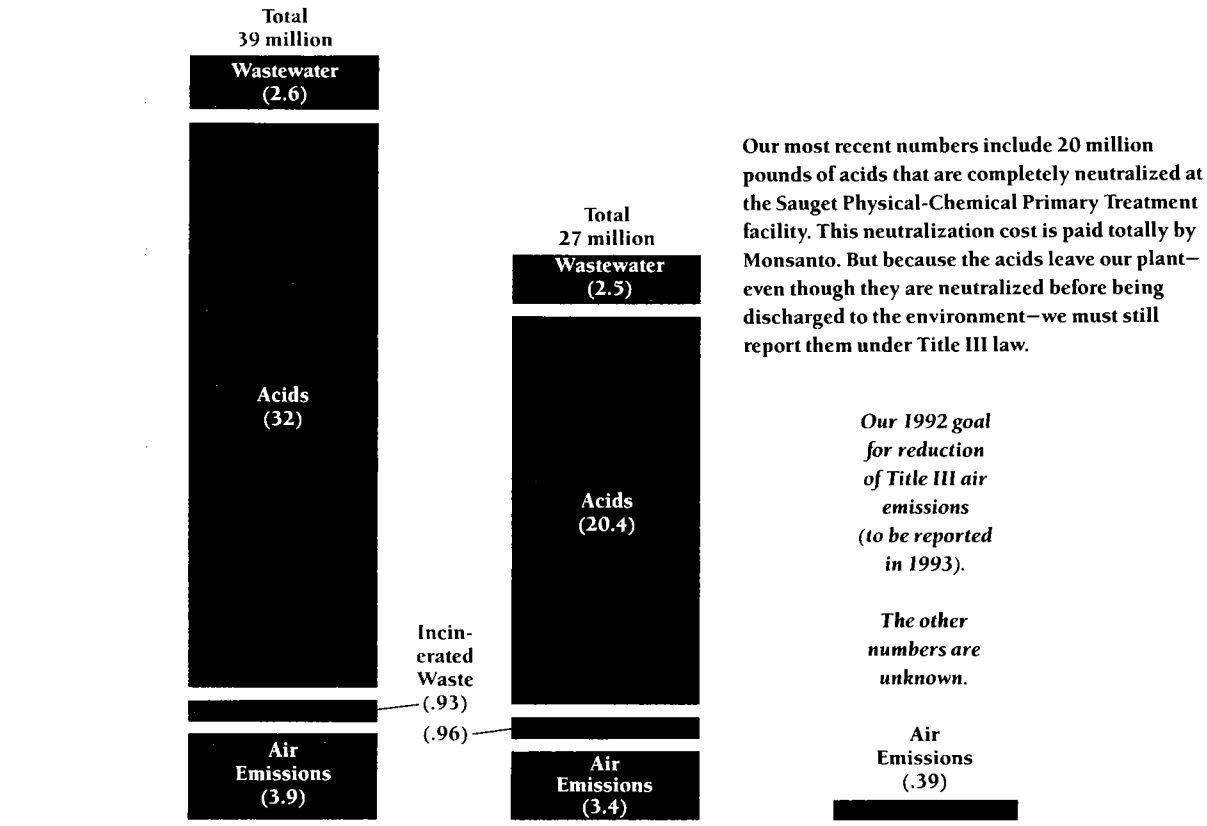
In our quest for new technology to eliminate waste, Monsanto scientists are experimenting with naturally occurring bacteria that are specially selected to break down chemical waste. If feasible, bacteria could replace some or all carbon use in the future.

Other new technologies are still on the drawing board. As we strive to meet our waste elimination targets, with zero waste being our ultimate goal, the 1990s will be a decade of rapid improvement.

DSW 137005
STLCOPCB4036964

When a chemical plant is located in your community, you have a right to know what happens inside the gate.

That's why the Krummrich plant freely shares information about our operations with our neighbors, providing them with Material Safety Data Sheets on our chemicals and inviting people in to see how we make our products.



Our most recent numbers include 20 million pounds of acids that are completely neutralized at the Sauget Physical-Chemical Primary Treatment facility. This neutralization cost is paid totally by Monsanto. But because the acids leave our plant—even though they are neutralized before being discharged to the environment—we must still report them under Title III law.

Our 1992 goal for reduction of Title III air emissions (to be reported in 1993).

The other numbers are unknown.

W. G. Krummrich Plant
Title III Reportable Emissions
(Numbers in millions of pounds)

Title III

When the federal SARA, Title III law was enacted in 1987, making public the amount of hazardous chemicals emitted to the environment, Monsanto welcomed the new law, even though we thought the public may be surprised and somewhat confused by the large numbers. Frankly, we were surprised by the numbers too, and...

- We took a hard look at the data using computer modeling and health assessments to assure ourselves that our emissions were not a threat to the safety and health of the community.
- We came forward and publicly announced the numbers, even though we were not required to do so.
- We made the commitment to voluntarily reduce the numbers.

DSM 137006
STLCOPCB4036965

How much is a pound?

One pint of liquid, depending on the density, equals approximately one pound. It's difficult, though, to visualize a pound of wastewater. Think of it this way: The average American family sends 100 gallons of water down the drain each day. That's more than one third of a million pounds of water each year. The pounds, whether they are household waste or waste from a large chemical plant, add up quickly.

Sharing Information

Sharing information opens the door to working together with our neighbors who are concerned about the environment. Once we sit down together and talk, we find that we have common ground.

Krummrich was the first Monsanto plant to form a Community Advisory Committee, made up of neighbors from all walks of life, to meet quarterly to talk about environmental concerns. Other chemical plants have looked to Krummrich for guidance in establishing their own committees



Members of the Krummrich Community Advisory Committee are people who care about the environment. Some of our members are (from left) Nicole Vaughn, editor, *Cahokia Dupo Journal*; George Foster, coordinator, East St. Louis Emergency Service and Disaster Agency; Chief Patrick Delaney, Sauget Police Department, and Venzetta Glenn, director of nursing, St. Mary's Hospital, East St. Louis.

DSM 137007
STLCOPCB4036966

We also invite anyone in who wants to see the plant and learn more about us. And we go out to classrooms to talk to students about chemicals and the environment.

Regulations

Working cooperatively with our regulators is also important, because those of us in industry share a common goal with the Environmental Protection Agency: to improve the environment in a way that is cost-effective and workable.

Monsanto's goal is to not only comply with regulations, but to go beyond them when we can.



The Sierra Club on a recent tour of the Krummrich plant.



Krummrich Plant Manager Bill Boyle (right) and IEPA Director Bernard Killian discuss the Krummrich environmental improvement program.

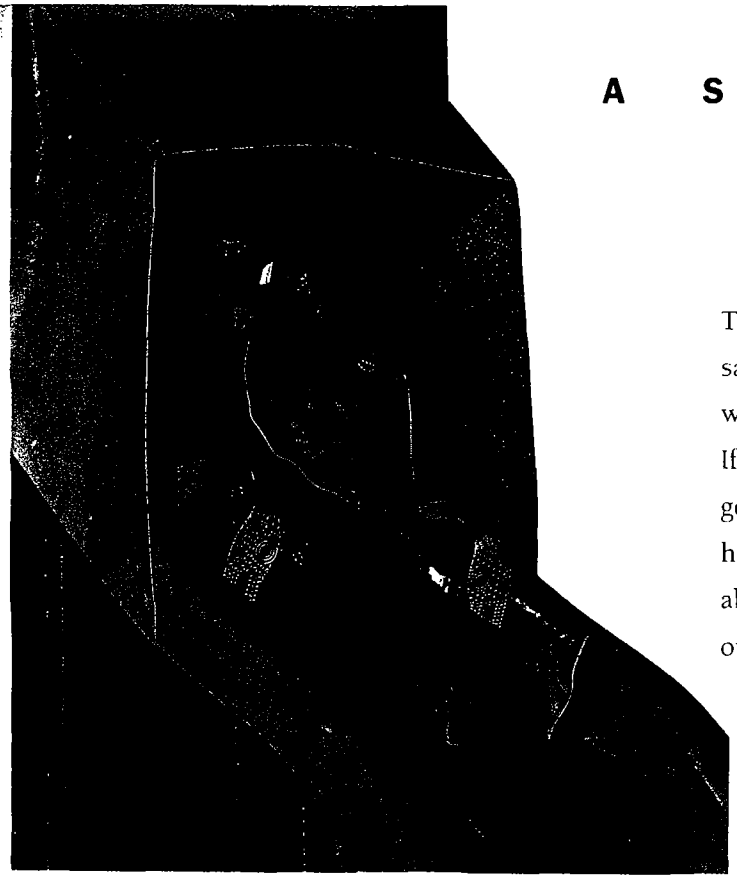
The Mission of the EPA

The Illinois Environmental Protection Agency (IEPA) was created in 1970 with a mandate to "realize the best environmental conditions possible consistent with the social and economic needs of the people of Illinois."

The agency works closely with industry, local government and the public as a front line manager of federal and state programs to protect our environment. The IEPA maintains a variety of records and general information about environmental programs. For more information about the IEPA, contact:

Illinois EPA
Office of Public Information
P.O. Box 19276
2200 Churchill Road
Springfield, IL 62794-9276
(217) 782-5562

DSM 137008
STLCOPCB4036967



A SAFE COMMUNITY

We firmly believe that the chemical industry is responsible for the safe handling of its chemicals, whether those chemicals are in the plant or in transport through your community to our customers.

Major industrial accidents are improbable, but they are possible. Both industry and community emergency responders must be prepared to handle any accident that could happen.

In Case of an Emergency

The Krummrich plant has been designed with safety devices that detect problems early and warn employees so accidents can be prevented. If a problem should occur, a Krummrich emergency response team is on call 24 hours a day to handle any plant emergency. Our first priority is always to minimize risk to our workers and to our neighbors.

On the Road

It is not enough to make, handle and store chemicals safely. We must ensure our products arrive safely at their destination—our customers' unloading docks.

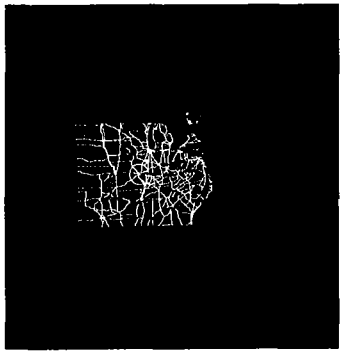
Our standards are high. We simply will not ship any product that is improperly packaged or labeled. For bulk shipments, we keep our tank cars in top repair and work closely with our over-the-road carriers to assure that truck deliveries are made with no leaks and no spills.



Our in-plant fire department can respond to a fire call within minutes. Here Jan Karsteter, fire protection specialist, checks one of 70 fire hydrants located throughout the plant. More than 1 million gallons of water are on hand to put out fires quickly.

DSM L37009

STLCOPCB4036968



One glance at this satellite tracking screen tells our plant distribution group the exact location of our P2S5 over-the-road shipments.

In 1989, Krummrich had zero transportation incidents. We're proud of that record, but not overconfident, because improvements can always be made. That's why we're testing a satellite tracking system for phosphorus pentasulfide (P2S5) trailer shipments, so this mode of transportation can be as safe as possible.

A Community Effort

Preparedness extends beyond the plant gate. If a transportation accident or chemical emergency threatens the community, industry and government experts both respond.



Radios donated by the Krummrich plant help East St. Louis police officer Milton Jones respond to emergencies.

The Krummrich plant works closely with neighboring industries, fire and police departments, and emergency service and disaster agencies to develop emergency plans and to share resources. Joint drills are also held to improve teamwork and sharpen skills. Mutual aid cooperation assures the best emergency response will be made to protect the community.

Local Emergency Planning Committee

Each community in America has an emergency response plan mandated by the federal Right-to-Know law. In St. Clair County, Illinois, the Local Emergency Planning Committee (LEPC) has developed a detailed countywide plan coordinating the efforts of industry, first responders and government. The Krummrich plant played a key role in developing the plan.

For more information about emergency planning in St. Clair County, contact:

William Schreiber
Information Coordinator
LEPC
321 West "F" Street
Belleville, Illinois 62220
(618) 277-3012

DSM 137010
STLCOPCB4036969

A CLEAN ENVIRONMENT

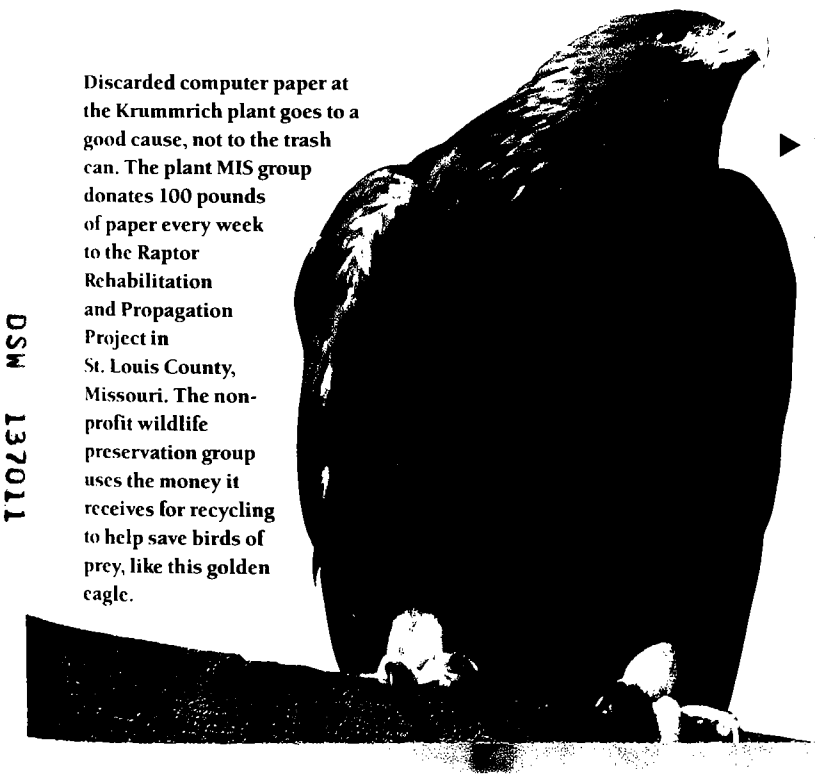
When business, government and the public act responsibly, we all benefit.

As a corporation, Monsanto continues extending the boundaries of environmental responsibility. We know we have the resources to do that, and we believe we have the moral obligation to use those resources in ways that go beyond legal compliance.

Monsanto has chosen to voluntarily reduce toxic releases and emissions because it is the right thing to do. It is also good business.

In the years to come, every American will have to contribute to the significant task of cleaning up our environment. Each one of us will have tough choices to make. There will be no easy answers, but one fact is certain: we're all part of the problem.

At Monsanto, we pledge to be part of the solution. Will you join us?



Discarded computer paper at the Krummrich plant goes to a good cause, not to the trash can. The plant MIS group donates 100 pounds of paper every week to the Raptor Rehabilitation and Propagation Project in St. Louis County, Missouri. The non-profit wildlife preservation group uses the money it receives for recycling to help save birds of prey, like this golden eagle.

Here's What You Can Do:

- Learn all you can about environmental issues affecting your community and how you can help.
- Read and follow label directions on household products. Even common products can be hazardous if improperly used or discarded.
- Almost 80 percent of household waste can be recycled. Make it a habit to recycle everything recyclable: paper, aluminum cans, glass and plastics.
- If there isn't already a recycling program at your office, start one. The EPA has information that can help you get organized.
- Take a minute to smell the roses.

By joining together, it is possible to have a clean and safe environment.

For today.
For tomorrow.

DSM 137011
STLCOPCB4036970

We are always glad to answer any questions you may have.

W. G. Krummrich Plant
Communications Dept.
Bldg. Monsanto Avenue
Sauget, IL 62206-1198
(618) 271-5835

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Monsanto is proud to support **Responsible Care**, the Chemical Manufacturers Association initiative for continuous improvement in health, safety and environmental protection within the chemical industry.

Monsanto

DSM 137012

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