The Dangerous Dozen:

A Look at How 12 Chemical Companies Jeopardize Millions of Americans

Environment Colorado Research & Policy Center

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Written by Meghan Purvis, Environmental Health Associate with Environment Colorado Research & Policy Center, and Alison Cassady, Research Director with Environment Colorado Research & Policy Center.

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Environment Colorado Research & Policy Center
1530 Blake Street, Suite 220
Denver, CO 80202
(303) 573-3871
info@environmentcolorado.org
www.environmentcolorado.org

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EXECUTIVE SUMMARY

Across the United States, thousands of industrial facilities use and store hazardous chemicals in large quantities that pose major risks to their neighbors. More than 100 of these facilities would each put at least one million people at risk of injury or death in the event of a chemical accident or terrorist attack.

When Congress passed the Clean Air Act Amendments of 1990, it required the U.S. Environmental Protection Agency (EPA) to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. EPA established the Risk Management Program, requiring companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Plan (RMP), including a hazard assessment that details the potential effects of an accidental release.

We reviewed the RMPs submitted by facilities using hazardous chemicals and found that a single company owning many facilities or a single facility in a large population center can endanger thousands and even millions of people.

Specifically, we found:

• The "Dangerous Dozen": The twelve companies endangering the most people are JCI Jones Chemical, The Clorox Company, Kuehne Chemical, KIK Corporation, DuPont, Pioneer Companies, Clean Harbors, GATX Corporation, PVS Chemicals, Dow Chemical, Ferro Corporation and Occidental Petroleum.

• The facilities owned by JCI Jones Chemical, The Clorox Company, and Kuehne Chemical put more than 20 million, 14 million, and 12 million people at risk, respectively.

• Between 1990 and 2003, companies, employees and concerned citizens reported more than 8,400 accidents involving oil or chemicals at facilities owned by these 12 parent companies to the National Response Center (NRC).

• Six of the 12 companies are members of the American Chemistry Council (ACC), the trade association representing the chemical industry in Washington, DC. ACC spent $4.3 million over 2002 and 2003 on in-house lobbyists, advocating against any mandatory standards for chemical plant security.

Many chemical facilities could mitigate or eliminate the risk they pose to surrounding communities. Industries often have multiple options for carrying out similar processes, and some of these options are inherently safer than others. Facilities that use fewer or smaller quantities of hazardous chemicals, or even make changes to storage pressure or other processes, eliminate the possibility of on-site chemical accidents and make themselves less appealing terrorist targets.

Most industrial facilities have not responded to the increased awareness of terrorism by switching to inherently safer technologies. Instead, industry organizations such as the American Chemistry Council have placed limited emphasis on increasing physical security at plants. Hiring more guards, building more fences, and placing more lights may all be part of a good security plan, but this does not actually reduce the threat to the community.

In order to protect communities in the shadow of chemical plants and other industrial facilities, we need to focus on reducing the likelihood of a catastrophic accident or attack.

• Switching chemicals and processes to something less volatile not only reduces the chemical hazard to the community, but also reduces the need for costly add-on security measures and the attractiveness of the facility as a target for attack. We need mandatory federal standards to protect communities from the hazards posed by chemical plants around the country by requiring facilities to switch to safer chemicals and processes where possible.

• The "Dangerous Dozen" companies should immediately review options for reducing hazards at their plants and set measurable goals and timelines for implementing hazard reductions.

CHEMICAL INSECURITY

Across the United States, thousands of industrial facilities use and store hazardous chemicals in large quantities that pose major risks to their neighbors. More than 100 of these facilities would each put at least one million people at risk of injury or death in the event of a chemical release.[1]

Accidents at chemical and industrial facilities are common. Since 1990, companies, employees and concerned citizens reported more than 416,000 accidents involving oil or chemicals to the National Response Center (NRC), or more than 29,000 incidents every year.[2] These accidents range from an oil sheen to a major disaster that resulted in casualties.

Even before September 11, 2001, the Agency for Toxic Substances and Disease Registry (ATSDR) addressed the weak security at chemical facilities. In 1999, ATSDR published a study of chemical site security in two key chemical communities – the Kanawha Valley in West Virginia and Las Vegas, Nevada. The study found the industry unable to fend off terrorist attacks, noting that industrial chemicals provide terrorists with "effective and readily accessible materials to develop improvised explosives, incendiaries and poisons."[3]

Since September 11, 2001, it is increasingly apparent that these facilities pose a serious threat, as they may become the target of a terrorist attack. A report by the Army Surgeon General ranked an attack on a chemical plant second only to a widespread biological attack in magnitude of the hazard to the public.[4] On February 12, 2003, the National Infrastructure Protection Center warned, "Al Qa'ida operatives…may attempt to launch conventional attacks against the U.S. nuclear/chemical-industrial infrastructure to cause contamination, disruption, and terror."[5]

Some facilities have made major progress by switching to the use of safer chemicals and processes that pose less of a threat to surrounding communities in the event of an accident. Soon after September 11th, for example, the Blue Plains Sewage Treatment Plant in Washington, DC switched from using and storing chlorine gas and sulfur dioxide on-site to using sodium hypochlorite bleach in its processes. Whereas chlorine gas from the Blue Plains facility could have enveloped downtown Washington, Anacostia, Reagan National Airport, or Alexandria in a toxic cloud, sodium hypochlorite bleach is far more benign if accidentally released.[6]

Unfortunately, few chemical facilities have followed the lead of the Blue Plains facility, changing the processes and chemicals they use to make their facilities inherently safer. Instead, industry organizations have placed emphasis on increasing physical site security measures. The American Chemistry Council, the chemical industry's lobbying organization, has issued site security guidelines for its member companies and requires these companies to take part in its Responsible Care program in order to continue membership in the organization. This set of guidelines, however, focuses only on site security and does not include minimum standards that facilities must follow. For example, it does not require that facilities plan for protection against an armed intruder. Moreover, Responsible Care does not recommend that facilities consider inherently safer technology to reduce the threat these facilities pose to surrounding communities. In fact, the American Chemistry Council instructs third party participants in site security reviews not to even consider safer technologies.

Hiring more guards, building higher fences, and placing more lights may all be part of a good security plan, but this does not actually reduce

the threat to the community. Switching chemicals and processes to something less volatile not only reduces the chemical hazard to the community, but also reduces the cost of physical security and the attractiveness of the facility as a target for attack.

Furthermore, some in industry and the government have proposed limiting the public's access to information about chemical hazards. Limitations have been placed on the information any individual can obtain about a chemical facility and its vulnerability zone, and even tighter restrictions have been proposed. EPA and the chemical industry have removed certain information from the Internet as well. Instead of safeguarding these facilities from terrorists, however, these efforts merely deny public accountability measures that encourage industry reform.

DANGEROUS DOZEN: THE FINDINGS

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. EPA established the Risk Management Program, requiring companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Plan (RMP), including a hazard assessment that details the potential effects of an accidental release and an evaluation of worst-case scenarios.[7] These scenarios estimate how far a chemical could travel off-site and still maintain toxic concentrations in certain weather conditions and report the number of people living within that distance, known as the "vulnerability zone."[8]

We reviewed the RMPs submitted by facilities using hazardous chemicals and found that a single company owning many facilities or a single facility in a large population center can endanger thousands and even millions of people. Specifically, we found:

• The "Dangerous Dozen": The twelve companies endangering the most people are JCI Jones Chemical, The Clorox Company, Kuehne Chemical, KIK Corporation, DuPont, Pioneer Companies, Clean Harbors, GATX Corporation, PVS Chemicals, Dow Chemical, Ferro Corporation and Occidental (Table 1).

• These 12 parent companies own 154 facilities in 31 different states and Puerto Rico (Appendix A).

• The facilities owned by JCI Jones Chemical, The Clorox Company, and Kuehne Chemical put more than 20 million, 14 million, and 12 million people at risk, respectively.

• Between 1990 and 2003, companies, employees and concerned citizens reported more than 8,400 accidents involving oil or chemicals at facilities owned by these 12 parent companies to the National Response Center (NRC), as seen in Table 2.[9]

• Six of the 12 companies are members of the American Chemistry Council (ACC), the trade association representing the chemical industry in Washington, DC. ACC spent $4.3 million over 2002 and 2003 on in-house lobbyists, advocating against any mandatory standards for chemical plant security.[10]

Table 1. 12 parent companies with most people residing in their vulnerability zones

Company	ACC member?	Facilities	People at Risk	Industry	Chemicals Used/Stored
JCI Jones Chemicals		12	20,197,108	Alkalies and Chlorine Manufacturing	Chlorine
The Clorox Company		9	14,362,964	Polish and Other Sanitation Good Manufacturing	Chlorine
Kuehne Chemical	Yes	2	12,000,013	Alkalies and Chlorine Manufacturing	Chlorine
KIK Corporation		7	9,168,538	Soap, Detergent, Sanitation Goods Manufacturing	Chlorine
DuPont Company**	Yes	33	9,119,178	Chemical Product Manufacturing	Chlorine, hydrofluoric acid, oleum
Pioneer Companies		6	7,134,000	Alkalies, Chlorine, Inorganic Chemical Manufacturing	Chlorine
Clean Harbors, Inc.		6	6,897,489	Hazardous Waste Treatment and Disposal	Propionitrile
GATX Corporation		4	6,202,700	Industrial Machinery Repair and Maintenance	Bromine, hydrofluoric acid
PVS Chemicals	Yes	4	6,130,000	Inorganic Chemical Manufacturing	Chlorine, sulfur dioxide (anhydrous)
Dow Chemical Co.**	Yes	41	6,032,985	Chemical Manufacturing	Phosgene, chlorine, hydrocyanic acid
Ferro Corporation	Yes	5	5,458,361	Organic and Other Chemical Manufacturing	Chlorine
Occidental	Yes*	25	5,199,212	Alkalies, Chlorine, Chemicals, Plastics Manufacturing	Chlorine, hydrogen chloride (anhydrous)

Source: EPA Risk Management Program

* Occidental Chemical, a division of Occidental, is a member of the American Chemistry Council (ACC). Approximately 90% of Occidental's facilities are petroleum, not chemical.
** Four facilities in the RMP program belong to DuPont-Dow Elastomers, a 50/50 joint venture of DuPont and Dow. In order to avoid double counting, we ascribed these facilities to DuPont.

Table 2. Reported chemical accidents at facilities owned by "Dangerous Dozen": 1990-2003

Parent Company	# of Accidents
Occidental	3019
Dow	2563
DuPont	2116
GATX	387
JCI Jones	106
Clean Harbors	87
Pioneer	66
PVS Chemicals	36
Ferro Corporation	25
Clorox	21
KIK	3
Kuehne Chemical Co.	2
Total	8431

Source: National Response Center

GAPS IN CURRENT REGULATION

A few state and federal policies address the problem of accidents at chemical facilities. Most of these policies, however, take a backwards view of chemical accidents and deal with responses to accidents, such as attempting to mitigate the effects of a chemical release. Few policies take the proactive approach and require that chemical facilities look to prevent chemical accidents with safer technologies instead of attempting to reduce the damage once an accident occurs.

The Emergency Planning and Community Right-to-Know Act

Congress passed the Emergency Planning and Community Right-to-Know Act (EPCRA) in 1986, partly in response to the Bhopal, India chemical accident that killed thousands of people. EPCRA requires chemical companies to submit information to the public and local first responders – such as fire fighters and police – about what chemicals they store and use on site. In addition, EPCRA created Local Emergency Planning Committees, or LEPCs, to provide public planning for emergencies and to improve communication between local chemical facilities and the surrounding communities. A 2001 survey of LEPCs, however, found that "with a few exceptions, they do not believe they are positioned to effectively encourage facilities to reduce chemical hazards."[11]

Public Right-to-Know and Prevention Planning Laws

One of the most important tools in protecting communities from accidents involving hazardous chemicals is the right of the public to know what chemicals are used, released, and stored in their communities. Existing right-to-know and prevention planning laws, at both the federal and state levels, have dramatically reduced the quantity of chemicals released or used. For example, the federal Toxic Release Inventory program, which requires several industry sectors to report the toxic chemicals they release into our air, water, and onto our land, documents that these industries reduced releases of carcinogenic chemicals by 41% between 1995 and 2000.[12]

In addition, a Massachusetts state law requires companies to disclose the chemicals used by their facilities, including the amounts on site, transported in products, released to the environment, and generated as waste. Companies also are required to produce toxics use reduction plans. As a result, between 1990 and 1999, facilities reduced their use of toxic chemicals by 41%, while at the same time production increased by 52% and companies saved $15 million.[13]

Current right-to-know laws, however, do not include the public's right to know about safer chemicals and processes facilities could be using to prevent accidents at their facilities. In other words, people have the right to know about problems, but not about solutions.

The Clean Air Act and Risk Management Program

In 1990, Congress passed legislation to establish the Risk Management Program, which is EPA's chief accident prevention program. These amendments to the Clean Air Act defined 140 toxic and flammable chemicals that represent a serious threat to human health and the environment and identified 15,000 chemical facilities that use or store large amounts of these chemicals. These facilities are required to develop Risk Management Plans (RMPs) and report them to U.S. EPA.[14] RMPs include a hazard assessment that details the potential effects of an accidental release; an evaluation of worst-case and alternative accidental releases; information on safety precautions, maintenance,

and monitoring; and procedures for informing the public and response agencies should an accident occur.[15]

In 1999, Congress limited public access to portions of RMPs to a few public reading rooms. EPA further weakened the program after September 11th, 2001, by removing information about the prevention program and emergency response program from the Internet. EPA placed the summary information previously available on the Internet in the public reading rooms.

State and Local Laws Move Towards Accident Prevention

A few state and local laws do move beyond responding to accidents and instead look at preventing accidents. Contra Costa County in California requires that chemical facilities integrate safer chemicals and processes when they implement their Risk Management Plans.[16]

In addition, New Jersey's Toxic Catastrophe Prevention Act (TCPA), which was passed in response to the Bhopal accident, requires chemical owners and operators to include risk "abatement" in their plans to reduce their risk to surrounding communities. Under the law, the state may order a facility to implement an "extraordinarily hazardous substance risk reduction plan," which could include requiring the company to switch to safer chemicals or processes.[17] TCPA has helped cut the amount of chemicals used and stored onsite, thereby reducing the risk of an accidental chemical release. Under the TCPA, hundreds of New Jersey facilities have replaced dangerous chlorine gas with safer alternatives or have dropped below reportable threshold amounts.

Recent Regulatory Action

Since September 11th, 2001, the federal government, particularly the White House, has been under pressure to address the security gap at chemical facilities. Under the Clean Air Act, EPA does have the authority to address security at chemical facilities; however, the agency has been concerned about the "litigation risk" involved, despite its past experience in regulating chemical facilities.[18] In fact, in June 2002, EPA had prepared a chemical security plan with talking points and a draft press release, but did not proceed under pressure from other agencies and the White House. In early 2003, EPA visited 30 facilities that agreed to meet. The nature and results of these visits are not known.

In February 2003, President Bush assigned responsibility for chemical facility security to the Department of Homeland Security (DHS). Since its inception in 2003, DHS has "placed chemical security on the top priority list for physical infrastructure protection;" deployed National Guard members to some chemical facilities; put together a risk assessment to identify the highest risk facilities; sent DHS security specialists to an unknown number of facilities; and completed vulnerability assessments at an unknown number of sites.[19] This effort has not, however, made any community safer by reducing the actual hazards at facilities using toxic chemicals.

POLICY RECOMMENDATIONS: USING SAFER CHEMICALS AND PROCESSES

Use Safer Chemicals

The most effective means of protecting American communities from chemical terrorism and accidents is to encourage and mandate hazard reduction. Each hazardous chemical facility should be required to review and implement inherently safer technologies wherever feasible and implement strict security standards where hazards remain. For a few facilities and companies, using safer chemicals is already a reality.

For example:

- Early in 2003, Valero Energy Corporation switched the chemical it used at its Wilmington, California oil refinery from hydrofluoric acid to modified hydrofluoric acid, which forms a less dangerous cloud if released. Since an explosion that caused an accidental release of hydrofluoric acid at a neighboring Torrance refinery in 1987, the local community and government have pushed to shut down two refineries that used hydrofluoric acid and required a third facility to change to modified hydrofluoric acid. The community was able to negotiate an agreement with the South Coast Air Quality Management District with regards to the Valero facility: Valero will pay a fine up to $1 million if the renovation is not complete by the end of 2005. The change is expected to cost Valero about $30 million.[20,21]

- In Wichita, Kansas, the Wichita Water and Sewer Authority's sewage treatment plant switched from using chlorine gas to ultra violet light in its disinfection processes. The plant expects to save money in the long run as a result of the change, as there is about a 20% anticipated cost savings in energy costs versus chemical costs.[22]

- DuPont's Victoria, Texas facility eliminated large volume storage of methyl isocyanate—the chemical that killed thousands of people in Bhopal, India—by establishing a process that uses up the chemical as soon as it is produced. On-site storage is limited to two pounds at any one time, substantially reducing the potential impact of an accidental release.[23]

Enact Federal Standards

There are currently no federal security standards for chemical facilities. Federal standards are necessary to ensure that all companies and facilities are adequately working to protect the public and reduce the possibility that a catastrophic release will occur.

The chemical industry often argues that requiring diverse and complex industries to reduce their possibility of a chemical accident is unrealistic and difficult to implement. Federal standards, however, could be flexible to accommodate such a variety of industry needs. Simply requiring facilities to publicly disclose viable options to their current chemical use and processes holds those facilities and companies accountable and greatly increases the probability that companies will prevent accidents through the use of safer chemicals and processes.

METHODOLOGY

The facilities examined in this report were all registered in EPA's RMP program as of September 2003.

The vulnerability zone data in this report were collected from Risk Management Planning reports obtained at Environmental Protection Agency Air Docket Centers throughout the country, in compliance with current guidelines and rules. EPA defines the radius of a vulnerability zone as "the maximum distance from the point of release of a hazardous substance in which the airborne concentration could reach the level of concern under specified weather conditions."[24] It is important to note that not all people living within a vulnerability zone could be affected by a single chemical release; those living downwind during a chemical release are most likely to be affected.

Information on the parent company of each facility was obtained from Risk Management Planning reports and company websites. In some instances, it was necessary to call the facility in order to determine proper ownership.

Because in many states, such as Louisiana or Texas, chemical facilities are often grouped together in industrial areas, their vulnerability zones overlap. For this reason, aggregate numbers of people at risk for the country and by state are not included. For the company totals, when the vulnerability zones of two facilities overlapped, we used the facility with the largest number of people residing in its vulnerability zone and dropped the other facility from the total. This likely underestimates the number of people living in the vulnerability zones of these companies' facilities.

We obtained data on chemical accidents from the National Response Center, www.nrc.uscg.mil. The National Response Center database includes every accident and incident reported to the agency. These accidents range from an oil sheen to a major disaster that resulted in casualties. The NRC data provides the best overall picture of security at chemical and oil facilities.

APPENDIX A. Number of People Living in Vulnerability Zones: By Parent Company and State

Company	State	Number of Facilities	Residential Population in Danger
JCI Jones Chemicals			
	California	1	8,050,000
	Florida	2	2,229,000
	Indiana	1	972,108
	Michigan	1	2,915,000
	New Hampshire	1	1,040,000
	New York	2	1,796,000
	North Carolina	1	878,000
	Ohio	1	1,025,000
	Virginia	1	173,000
	Washington	1	1,119,000
	Total	12	20,197,108
The Clorox Company			
	California	2	5,262,000
	Florida	1	541,000
	Georgia	1	803,257
	Illinois	1	3,960,000
	Maryland	1	1,072,000
	Ohio	1	1,280,707
	Puerto Rico	1	13,000
	Texas	1	1,431,000
	Total	9	14,362,964
Kuehne Chemical			
	Delaware	1	13
	New Jersey	1	12,000,000
	Total	2	12,000,013
KIK Corporation			
	California	1	4,574,197
	Colorado	1	699,871
	Florida	1	270,000
	Georgia	1	226,770
	Louisiana	1	39,600
	Texas	1	3,158,100
	Virginia	1	200,000
	Total	7	9,168,538
DuPont			
	Alabama	1	75,000
	Delaware	1	565,451

Company	State	Number of Facilities	Residential Population in Danger
DuPont, continued	Kentucky	3	1,010,000
	Louisiana	4	442,605
	Mississippi	1	222,100
	Montana	1	22,000
	New Jersey	3	2,000,593
	New York	1	0
	North Carolina	1	24,000
	Ohio	1	1,000,000
	Oklahoma	1	25,000
	Tennessee	3	997,000
	Texas	7	2,352,429
	Virginia	3	13,000
	West Virginia	2	370,000
	Total	33	*9,119,178
Pioneer Companies			
	California	2	4,940,000
	Louisiana	1	414,000
	Nevada	1	1,000,000
	Washington	2	780,000
	Total	6	7,134,000
Clean Harbors			
	Connecticut	1	17,312
	Illinois	1	5,077,400
	Maryland	1	844,271
	Massachusetts	1	381,250
	Nebraska	1	3,025
	Ohio	1	574,231
	Total	6	6,897,489
GATX Corporation			
	California	1	1,951,000
	Georgia	1	68,000
	Indiana	1	4,050,000
	Texas	1	133,700
	Total	4	6,202,700
PVS Chemicals			
	Illinois	1	3,300,000
	Indiana	1	**800,080
	Michigan	1	2,000,000
	New York	1	830,000
	Total	4	*6,130,000

**This vulnerability zone overlaps with the vulnerability zone for the Illinois facility and is therefore not included in the total.

Company	State	Number of Facilities	Residential Population in Danger
Dow Chemical			
	Arkansas	1	110
	California	3	940,689
	Connecticut	1	8,100
	Georgia	2	801
	Illinois	3	426,127
	Kentucky	2	147,665
	Louisiana	6	1,175,105
	Michigan	5	374,000
	New Hampshire	1	655,400
	New Jersey	1	300
	New York	1	1,500
	Ohio	1	100
	Puerto Rico	2	24,415
	Texas	7	2,078,750
	West Virginia	5	199,923
	Total	41	*6,032,985
Ferro Corporation			
	Indiana	1	1,990,678
	Louisiana	1	2,000
	New Jersey	2	3,400,000
	Texas	1	65,683
	Total	5	5,458,361
Occidental			
	Alabama	2	412,249
	California	1	0
	Delaware	1	585,780
	Illinois	1	100
	Kentucky	1	3,400
	Louisiana	2	847,183
	New Jersey	2	2,900
	New York	2	1,100,000
	Ohio	1	0
	Pennsylvania	1	13,600
	Texas	11	2,234,000
	Total	25	*5,199,212

* When the vulnerability zones of two facilities overlapped, we used the facility with the largest number of people residing in its vulnerability zone and dropped the other facility from the total. This likely underestimates the number of people living in the vulnerability zones of these facilities.

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