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Environmental Protection
Agency

Office of Pollution
Prevention and Toxics
7408

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EPA

EPA's 33/50 Program Company Profile

Bristol-Myers Squibb Company

Partnership in Prevention
Government-Industry-Community

This Company Profile is part of a series of reports being developed by EPA to highlight the accomplishments of companies participating in the 33/50 Program. The 33/50 Program is an EPA voluntary pollution reduction initiative that promotes reductions in direct environmental releases and offsite transfers of 17 high-priority toxic chemicals. The program derives its name from its overall goals — an interim goal of a 33% reduction by 1992 and an ultimate goal of a 50% reduction by 1995. The program uses 1988 Toxics Release Inventory (TRI) reporting as a baseline. In February, 1991, EPA began contacting the parent companies of TRI facilities that reported using 33/50 Program chemicals since 1988 to request their participation in the 33/50 Program. As of November, 1995, nearly 1,300 companies had elected to participate in the Program, pledging to reduce emissions of the 17 target chemicals by more than 380 million pounds by 1995. Companies set their own reduction targets, which may vary from the Program's national 33% and 50% reduction goals.

17 PRIORITY CHEMICALS TARGETED BY THE 33/50 PROGRAM

BENZENE
CADMIUM & COMPOUNDS
CARBON TETRACHLORIDE
CHLOROFORM
CHROMIUM & COMPOUNDS
CYANIDES
DICHLOROMETHANE*
LEAD & COMPOUNDS
MERCURY & COMPOUNDS
METHYL ETHYL KETONE
METHYL ISOBUTYL KETONE
NICKEL & COMPOUNDS
TETRACHLOROETHYLENE
TOLUENE
1,1,1-TRICHLOROETHANE
TRICHLOROETHYLENE
XYLENES

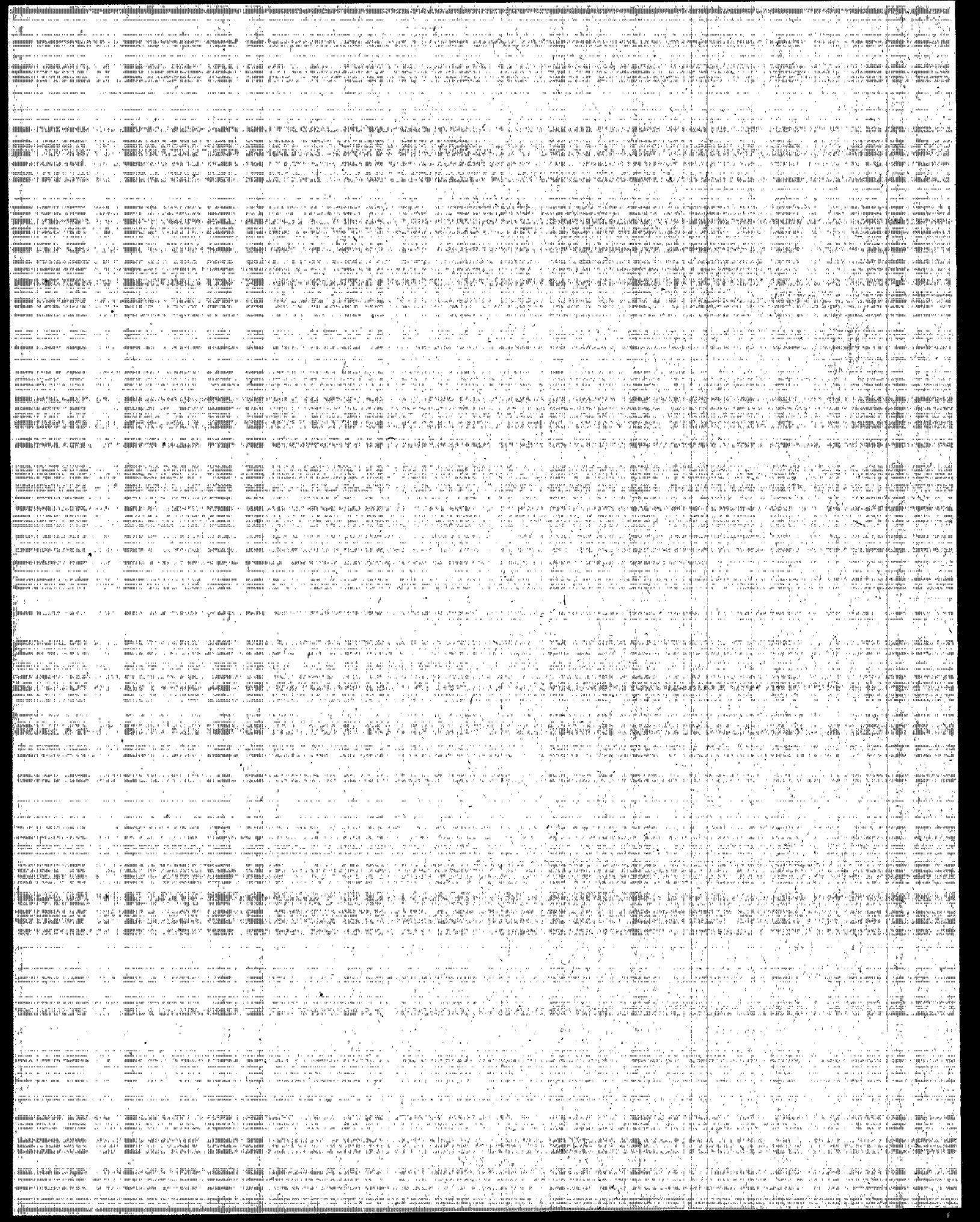
* Also referred to as methylene chloride

Industry exceeded the 33/50 Program's interim 33% reduction goal by more than 100 million pounds in 1992. National emissions of Program chemicals were reduced by an additional 100 million pounds in 1993, bringing total reductions since 1988 to more than 685 million pounds (46%). Facilities' TRI projections suggest that the Program's ultimate 50% reduction goal will be observed to have been achieved or exceeded in the 1994 TRI data, a full year ahead of schedule. The 1,300 companies enrolled in the 33/50 Program have accounted for most of the Program's pollution reductions. Representing just 15% of eligible companies and owning only a third of the facilities reporting Program chemicals to TRI, participants are responsible for 78% of the reductions since 1988 and 98% of the 100 million pounds reduced in 1993.

EPA is committed to recognizing companies for their participation in the 33/50 Program and for the emissions reductions they achieve. The Program issues periodic Progress Reports, in which participating companies are listed and highlighted. In addition, Company Profiles, such as this one, are being prepared to provide more detailed information about how companies have achieved their emissions reductions. Information presented in these profiles is drawn from a number of sources, including the company's written communications to the 33/50 Program, extensive interviews with company representatives, the annual TRI reports submitted by the company's facilities (including Pollution Prevention Act data reported to TRI in Section 8 of Form R), and, in many cases, site visits to one or more of the company's facilities. Mention of trade names, products, or services in this document does not convey, and should not be interpreted to convey, official EPA approval, endorsement, or recommendation.

Copies of other 33/50 Program Company Profiles, as well as Reductions Highlights documents summarizing all of these Profiles, may be obtained by contacting the Program as specified in the box below. In addition, all written company communications to EPA regarding the 33/50 Program are available to the public upon request.

For information on the 33/50 Program, contact the TSCA Hotline at (202) 554-1404 or contact 33/50 Program staff directly by phone at (202) 260-6907 or by mail at Mail Code 7408, Office of Pollution Prevention and Toxics, U.S. EPA, 401 M Street, SW, Washington, D.C. 20460.

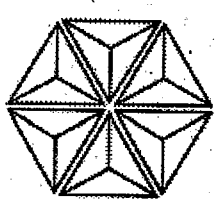


BRISTOL-MYERS SQUIBB COMPANY

SUMMARY

Bristol-Myers Squibb Company reduced releases and transfers of 33/50 Program chemicals by 54 percent or over 2.6 million pounds between 1988 and 1993. Of this amount, the two projects described in this case study at their Syracuse, New York facility, accounted for approximately 1.25 million pounds. The first project improved filtration, drying, and blending processes in penicillin and cephalosporin manufacturing operations, dramatically reducing dichloromethane air emissions. The second project used state-of-the-art filtering technology to significantly reduce methyl isobutyl ketone air emissions from penicillin production. These projects, which required an investment of approximately $10 million, save the company $1.5 million a year.

COMPANY BACKGROUND



The Bristol-Myers Company merged with E.R. Squibb and Sons to form the Bristol-Myers Squibb Company in 1989. The company researches, develops, manufactures and markets health care and consumer products worldwide. The company has its headquarters in New York, New York and employs 48,000 employees at its 62 facilities located in 35 countries. In 1994, sales were $12 billion. The company structures its business groups along four major product lines:

- Pharmaceuticals (57 percent of company sales) manufactures anti-cancer, cardiovascular, central nervous system, anti-infective and dermatological pharmaceuticals.

Bristol-Myers Squibb Company researches, develops, manufactures, and markets health care and consumer products worldwide.

- Consumer and Personal Products (17 percent of sales) produces analgesics, cough/cold products, vitamins, deodorant/antiperspirants, hair coloring and skin and hair care products.

- Medical Devices (15 percent of sales) provides artificial hips and knees, ostomy supplies, wound care products, powered surgical instruments, as well as instruments for least invasive surgery.

- Nutritionals (11 percent of sales) manufactures infant formula, specialty formulas for nutritional disorders, and nutritional supplements for children and adults.

The Bio/Chem Division produces bulk products for the company's pharmaceutical business. Bulk products are those produced in large quantities that are not yet in their final marketable form such as tablets or capsules. The Bio/Chem Division includes the Syracuse, New York facility, the Barceloneta and Humacao facilities in Puerto Rico, and other facilities in Europe. The Syracuse facility is the largest of these and manufactures the bulk products for the company's worldwide distribution of antibiotic products.

The company manufactures and markets several thousand different products around the world. Some of its products include Capoten™, a leading cardiovascular drug, the antibiotics amoxicillin and ampicillin, Bufferin™ and Excedrin™ pain relievers, Comtrex™ cold medication, Keri™ skin care lotion, Ban™ roll-on deodorant, Clairol™ hair coloring, and Enfamil™ infant formula.

Environmental Strategy

Bristol-Myers Squibb's corporate environmental policies, programs, and procedures serve as a framework and worldwide standard for each of its divisions within the four business groups. In the past the company largely viewed its environmental responsibility as mainly complying with its environmental regulatory requirements. In 1991, spurred by CEO interest, the company enhanced its environmental program and established a goal of environmental leadership. The newly assigned Environmental Health and Safety Vice President, with direct lines to upper management, created an initiative called "Environment 2000."

The company bases its "Environment 2000" initiative on six elements: product life cycle management, continuous improvement, taking responsibility for everything the company does, creation of a grass roots employee environmental ethic, open communications with stakeholders, and active participation in the resolution of environmental challenges on a local, national, and global basis. Bristol-Myers Squibb designed this initiative to incorporate environmental responsibility into the strategic business planning of all company divisions.

The cornerstone of the "Environment 2000" initiative is product life cycle management. Product life cycle management evaluates environmental impacts of the company's products at each stage of the product life cycle: design, manufacturing, packaging, distribution, use, and disposal. In 1992, the company began conducting product life cycle reviews on existing and future products. All business divisions of the company include product life cycle goals in their five-year plans. In addition, these groups are currently in various stages of implementing other elements of the "Environment 2000" initiatives. Each division develops its own programs to fit its specific needs, but still must be consistent with corporate policies and procedures. The Corporate Office of Environmental Health and Safety is responsible for the development, guidance, and continuous improvement of environmental programs and policies.

In 1991, spurred by CEO interest, the company enhanced its environmental program and established a goal of environmental leadership.

To foster a grass roots environmental ethic within the company, Bristol-Myers Squibb has implemented an employee awareness and education program. One product of this program is a pollution prevention handbook with background information, checklists, and case studies to educate employees on how to apply pollution prevention in research and development, marketing, manufacturing, maintenance, purchasing, packaging, distribution, sales, and general management. The company has also developed training programs addressing such subjects as The Clean Air Act and product life cycle (see above). Company guidelines specify that full-time environmental professionals must complete, at company expense, at least 40 hours of annual continuing environmental training related to their job assignments. Other company education initiatives include corporate and divisional employee publications; committee activities that set divisional waste minimization goals and report annual progress for all relevant facilities; management awareness training; and development of resources such as the company environmental manual that stresses prior assessment and prevention of environmental risk.

The cornerstone of the "Environment 2000" initiative is product life cycle management.

Stakeholder communication is a fundamental element of both "Environment 2000" and Bristol-Myers Squibb's Corporate Pledge which sets forth the company's concern for the interests and expectations of its stakeholders. Internally, the company fosters communication through employee education, functional and cross-functional committees, and the Office of Corporate Conduct. Externally, it actively seeks input and dialogue with stakeholders such as investors, suppliers, customers, consumers, environmentalists, public interest groups, and government leaders at the national, regional, and local levels.

To foster a grass roots environmental ethic within the company, Bristol-Myers Squibb has implemented an employee awareness and education program.

The company also works with other business groups and organizations with active environmental programs. In 1991, the company endorsed the International Chamber of Commerce (ICC) Business Charter for Sustainable Development. It also participates in the Coalition of Northeast Governors' challenge to reduce packaging waste and is a member of the Global Environmental Management Initiative. The Bio/Chem division is also a member of the Chemical Manufacturers' Association. As a measure of its environmental progress, the company publishes environmental reports and newsletters to highlight its environmental accomplishments and progress worldwide.

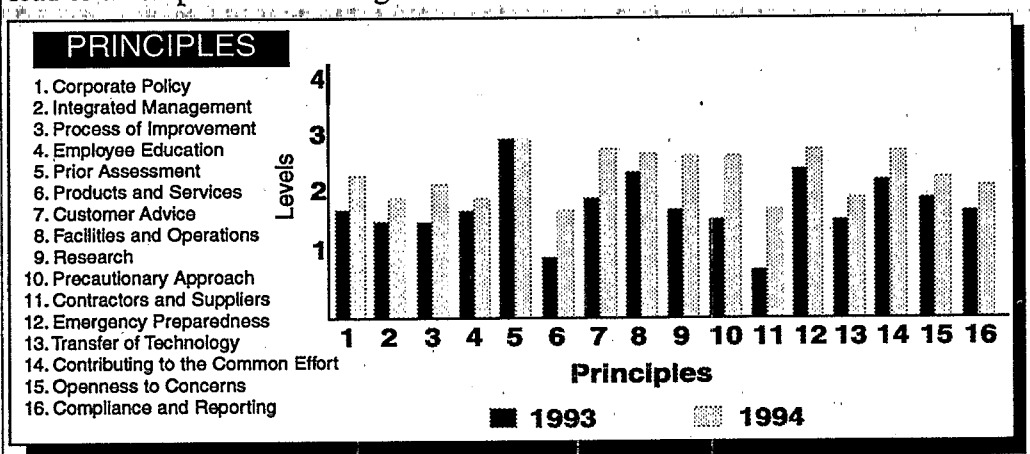
In 1991, the company endorsed the International Chamber of Commerce (ICC) Business Charter for Sustainable Development.

In 1993, the company implemented a self-assessment program that uses the 16 ICC Charter principles, listed in Appendix A, as a basis for annually measuring environmental, health, and safety performance. The Environmental Health and Safety (EHS) staff develops a corporate rating on a scale of one to four in each category by combining the individual ratings of each of the company's divisions. A level one score means that a division is achieving compliance with governmental laws and regulations, and company policies. A level two score indicates that management systems rather than individuals maintain continued compliance and evaluate products and processes. A level three score describes a division that is integrating EHS responsibilities across all functions and levels in its business. EHS awards a level four score when a division is innovating to continually improve products and processes, and to enhance efficiencies and competitive advantage. Since the importance of each of the 16 principles differs greatly between divisions, this rating system is not meant to be a report card, but rather a benchmark for continued improvement.

Exhibit 1 presents Bristol-Myers Squibb's performance assessment results for 1993 and 1994. Two of its highest ratings were on its prior assessment of the environmental impact of acquisitions and divestitures (Principle 5) and the environmental management of its facilities and operations (Principle 8). In 1993 the company scored low on making ongoing improvements in the environmental impact of products at each stage of their product life cycle from "cradle to grave," (Principle 6). This is a relatively new concept with which few companies have much experience and the 1994 results indicate that Bristol-Myers Squibb is improving. The company believes that it is on the right track in taking a pragmatic, flexible approach that will empower all of its people to examine the environmental impact of what they do and make sound business decisions that will lead to a competitive advantage.

Exhibit 1

Bristol-Myers Squibb's Environmental Performance Assessment Results



Levels of Performance (Level 4 Is Best)

3-4 Innovating to Continually Improve

2-3 Integrating EHS Across Business

1-2 Developing/Implementing Compliance Systems

0-1 Responding/Reacting to Regulations/Corp. Guidelines

Bristol-Myers Squibb's environmental strategy continues to evolve through "Environment 2000." Its current policy is "*to protect the health, safety, and quality of life of its employees and the public, and to exercise responsible stewardship of natural resources that may be impacted by Company activities.*" This policy not only commits the company to minimize waste, but also undue environmental impacts of all its activities and products. The policy extends outside company gates to suppliers through the company's purchasing guidelines,

shown in Appendix B, which require consideration of source reduction, availability of recycled materials, recyclability/reusability, renewable resources, hazard reduction, process waste reduction, handling and disposal, environmental technology, energy efficiency, and suppliers' environmental sensitivity.

Overview of 33/50 and TRI Chemical Releases and Transfers

Since 1988, Bristol-Myers Squibb has reported releases and transfers of eight 33/50 Program chemicals. The following is a description of their use and primary release media:

Chromium and nickel are components of metals used in the manufacture of medical implant products. The machining, polishing, and cleaning of these products generate the chromium- and nickel-containing wastes which are released to landfill, or transferred off-site to POTWs or for treatment or disposal.

Dichloromethane and methyl isobutyl ketone are used as solvents in the manufacturing of bulk pharmaceuticals, and are released primarily as fugitive air emissions, with additional quantities transferred off-site to POTWs or for treatment or disposal.

Toluene is used primarily in the processing of proteins for nutritional products, as well as in other solvent applications. Virtually all of its releases and transfers were as fugitive air emissions and transfers off site for treatment or disposal, with small amounts transferred off-site to POTWs.

BRISTOL-MYERS SQUIBB COMPANY RELEASES AND TRANSFERS OF TRI CHEMICALS

33/50 Chemical	1988	1993
Chromium/Chromium compounds	1	<1
Dichloromethane	2,372	972
Methyl ethyl ketone	1	NR
Methyl isobutyl ketone	2,225	1,172
Nickel	1	NR
Toluene	111	95
1,1,1-Trichloroethane	165	25
Xylene*	NR	NR
33/50 Subtotal**	4,876	2,265
Other TRI Chemicals:	7,435	4,561
TOTAL**	12,311	6,826

NR Not reported
** Releases and transfers of xylene were reported in 1990,1991 and 1992.*
*** Columns do not sum to totals due to rounding.*

Exhibit 2

Releases and Transfer of TRI Chemicals by Bristol-Myers Squibb Company (in 1,000 of lbs.)

1,1,1-Trichloroethane is used to clean a variety of parts and equipment and is released primarily as fugitive air emissions.

Xylene and methyl ethyl ketone were used as solvents in pharmaceutical manufacturing, and both were released primarily as fugitive air emissions or transfers off-site to POTWs.

In 1988, Bristol-Myers Squibb reported a total of 12,311,200 pounds of releases and transfers of TRI chemicals. Of this total, 4,876,002 pounds were 33/50 Program chemicals. Exhibit 2 presents a summary of the company's TRI data for 1988 and 1993. Appendix C presents these data in more detail. Air emissions accounted for 71 percent of Bristol-Myers Squibb's 1988 releases and transfers of 33/50 Program chemicals, followed by transfers to POTWs (17 percent of total), and transfers off-site for treatment and disposal (12 percent of total). Exhibits 3 and 4 illustrate the breakdown of Bristol-Myers Squibb's 1988 releases and transfers of 33/50 Program chemicals by chemical and by release media, respectively.

Exhibit 3

Bristol-Myers Squibb Company Releases & Transfers of 33/50 Program Chemicals (1988)

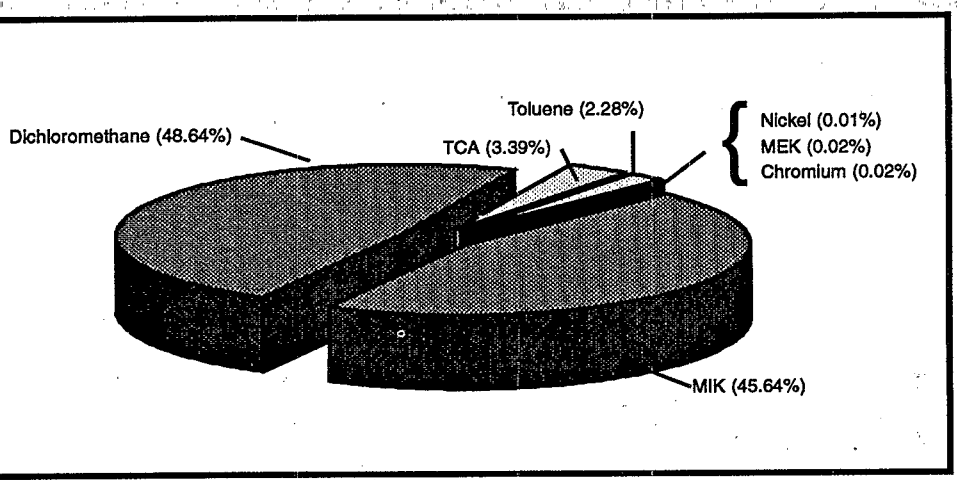
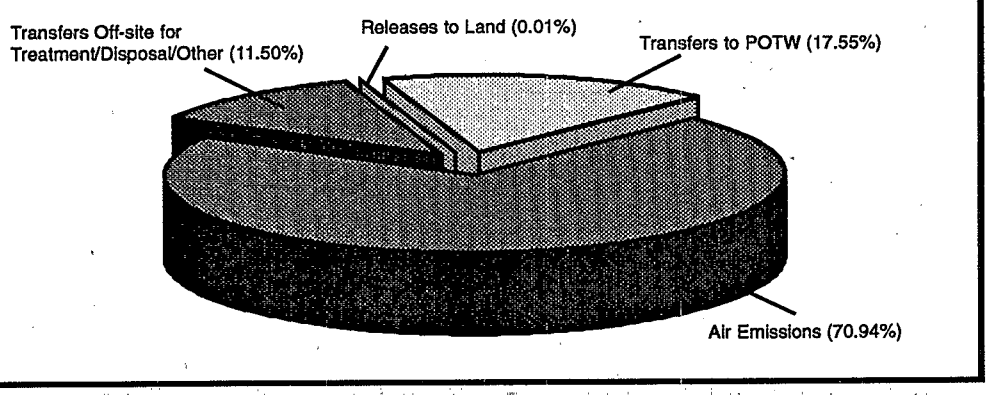


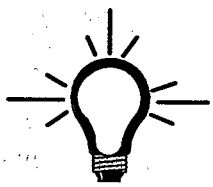
Exhibit 4

Bristol-Myers Squibb Company 33/50 Program Chemical Releases & Transfers by Media (1988)



In 1988 the Bio/Chem Division contributed 4,314,760 pounds or 88 percent of the company's total 33/50 Program chemical releases and transfers. The Syracuse facility alone contributed a total of 3,084,180 pounds or 63 percent of the company's 1988 total. The Syracuse facility's releases and transfers of 33/50 Program chemicals were 1,005,000 pounds of dichloromethane, 2,047,000 pounds of methyl isobutyl ketone and 32,180 pounds of toluene. Appendix D gives a more detailed description of releases and transfers of TRI chemicals at this facility.

33/50 Program Goals and Reduction Projects



Bristol-Myers Squibb joined the 33/50 Program in May 1991 with a commitment to achieve a 50 percent reduction in releases and transfers of 33/50 Program chemicals by year-end 1995, using 1988 TRI data as a baseline. This is equivalent to a reduction of 2,438,001 pounds. The company also established an interim goal of a 33 percent reduction in releases and transfers by the end of 1992. It indicated that it would rely primarily on source reduction and recycling as the preferred methods of achieving its goals.

Responsibility for 33/50 Program implementation at Bristol-Myers Squibb rests with Senior Operations Management at each company division. Departments involved in specific reduction projects included manufacturing, chemical process development, engineering, materials management, research and development, quality control, maintenance, regulatory affairs, and environmental health and safety. Product life cycle review committees, pollution prevention committees, waste minimization committees, and productivity improvement teams also identified projects and potential methodologies for program implementation.

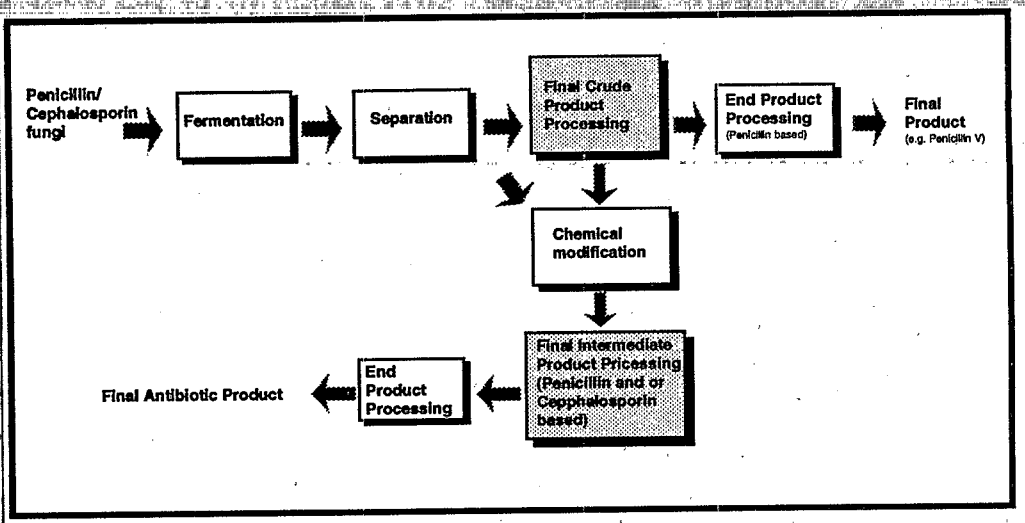
Bristol-Myers Squibb's current environmental policy is "to protect the health, safety, and quality of life of it's employees and the public, and to exercise responsible stewardship of natural resources that may be impacted by Company activities."

The manufacture of bulk pharmaceutical products typically involves complex and highly proprietary processes. Exhibit 5 provides a generic description of such manufacturing processes focusing on antibiotic production. The process begins with fermentation of penicillin or cephalosporin fungi to provide the desired microbial product, followed by separation to isolate this product from other substances in the fermentation mixture. Depending on the end product, the separated substances can be further processed without chemical modification, or can be chemically modified to produce the desired end product. For example, Penicillin V is obtained by direct fermentation, while the other penicillins and cephalosporins are produced by chemical modification of the isolated fermentation product. The Syracuse facility manufactures these "final crude" and "final intermediate" products. Other company facilities produce the end product which is finished and packaged to meet FDA requirements for market use.

From 1988 to 1993, the company initiated a number of projects that resulted in reductions of releases and transfers of 33/50 Program Chemicals. The following sections describe two projects that resulted in significant reductions in

Exhibit 5

Flow Diagram for Penicillin/ Cephalosporin Based Antibiotic Product Process



releases and transfers of dichloromethane and methyl isobutyl ketone at the Syracuse facility. This facility's multi-functional team proposed these projects because they satisfied a number of its objectives, such as improved productivity and efficiency of manufacturing operations, reduced cost, reduced solvent emissions, and reduced employee exposure to product dust and solvents. Both projects required substantial capital investment and business management approval at the divisional and corporate levels.

Project #1: Penicillin/Cephalosporin Manufacturing Improvements Project (Titus System)

The Syracuse team's first project involved changes to the final intermediate product manufacturing operations for 6-aminopenicillanic acid (6-APA) and 7-aminocephalosporanic acid (7-ACA). The first step in manufacturing 6-APA is to extract Penicillin V from a fermented slurry. Special enzymes then alter the chemical structure of Penicillin V in a process known as enzymatic splitting to produce 6-APA. The production of 7-ACA is accomplished by chemically modifying separated Cephalosporin C. The top diagram in Exhibit 6 shows a flow diagram of the facility's original process. The product slurry shown in this exhibit is a mixture of crystallized product, solvent, and water. Methyl isobutyl ketone, methanol and dichloromethane are specific solvents used in the product slurry. Equipment such as the centrifuge, dryer, blender and product containers were not vapor-tight in the original process and were sources of solvent and product dust emissions.

After targeting the process, products, and emission sources, the team identified reduction options. Team members used professional and trade associations, academic affiliations, internal technology transfer, and federal and state government agencies as sources of information on alternative chemicals, reduction methods, and recycling practices. Their preliminary investigation indicated that chemical substitution was not feasible because of the long lead times required to obtain

FDA approval to change process chemicals, but that process and equipment changes could substantially improve the existing processes. The team also found that another company already used such equipment in similar operations at a facility in Mexico. Members of the team visited the Mexican facility to get a first-hand look at the operations. After sharing the visit experience with other team members, the group decided that they could use similar equipment at the Syracuse facility.

The equipment the team selected is called the Titus system. It uses an air-tight "closed-loop" patented process to filter, dry and bulk-package the final product intermediates 6-APA and 7-ACA. The bottom flow diagram in Exhibit 6 shows the new process. The product slurry is fed in at one end of the process, is dried and blended, and then is removed from the other end as a final intermediate

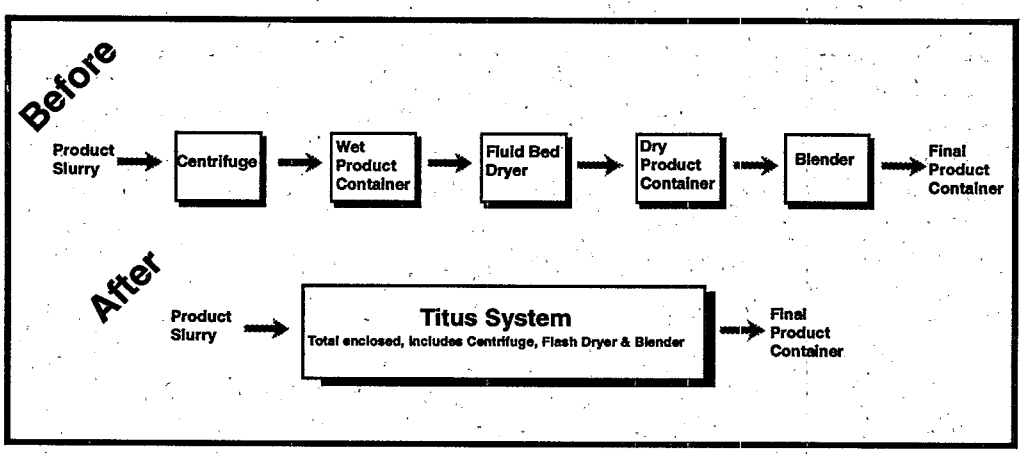


Exhibit 6

Final Intermediate Product Processing Steps Before and After Incorporation of the Titus System Project

product. This processing requires less solvent than the previous process because the system is fully enclosed and recovers most of the solvent for reuse. The new process also includes nitrogen blanketing to reduce solvent losses and reduce fire hazards. The inert nitrogen atmosphere inside the process equipment minimizes solvent evaporation and reduces fire hazards by preventing oxygen in the air from coming into contact with the highly flammable solvents. Exhibit 7 presents a schematic of the Titus system.

Bristol-Myers Squibb's Central and Syracuse Plant Engineering Groups had overall project management responsibilities for installing and housing the equipment, which was designed to the company's specifications by an outside engineering firm. Lab-scale experiments, and bench-scale and pilot-scale studies were conducted to investigate system performance prior to final design and ordering of the equipment. In addition, the team obtained business management approval at the divisional and corporate levels.

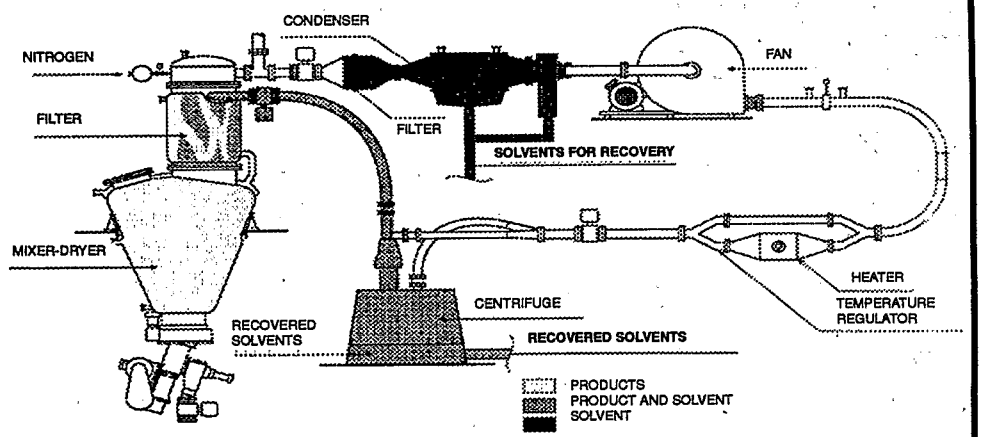
Operation of the Titus system began in 1989 and was fully operational at the Syracuse facility in June of 1990. The equipment has met all design specifications. The company estimates that the Titus system has reduced annual releases and transfers of dichloromethane by approximately 700,000 pounds, methyl isobutyl ketone by approximately 50,000 pounds and methanol by approximately 100,000 pounds compared to 1988 levels. In addition, this project reduced fire

Implementation of the Titus system resulted in annual cost savings of about $700,000 based on efficiency improvements, material, and labor costs.

Exhibit 7

The Titus System

TITUS
Automated System



TITUS is a "closed loop" automated system that greatly reduces solvent emissions from chemical manufacture.

safety hazards and employee exposure to solvents and product dust because of the closed-loop design and safety measures incorporated into the system. These benefits helped justify the investment, which exceeded the company's usual two-year payback expected on capital improvements. Implementation of the Titus system required a significant capital investment of $8 million. The company estimates annual cost savings of about $700,000 based on efficiency improvements, material, and labor costs.

The company estimates that the Belt Filters project has reduced releases and transfers of methyl isobutyl ketone by approximately 500,000 lbs compared to 1988 levels.

Project # 2: Penicillin Processing Manufacturing Improvement Project (Belt Filters)

The second project that the Syracuse team initiated involved changes to the final crude product manufacturing operations for Penicillin V-based products. Penicillin V is extracted from fermentation products in a solvent extraction process and subsequently sent through the final crude product processing steps. The crude Penicillin V can be used to produce the end Penicillin V product or 6-APA, which is used to manufacture antibiotic products such as amoxicillin and ampicillin. The top half of Exhibit 8 shows a process flow diagram of the original process. The product slurry is a mixture of Penicillin V crystals in methyl isobutyl ketone and water. Additional TRI chemical solvents are used to wash the Penicillin V crystals in subsequent steps. The filter press, wet product container, reslurry tank, and conveyor equipment originally used in this process were not vapor-tight and were sources of significant solvent emissions.

The team's decision-making and implementation process on this project was similar to that used for the Titus system project, except that the team members did not conduct facility visits. Exhibit 8 shows a process flow diagram of the

improved process and equipment the team selected for this project. In this new system, the Penicillin V mixture is evenly distributed on the belt prior to entering the unit. As it enters the filter it is washed with solvent and proceeds in timed steps along the filter length. A vacuum within the vessel removes the spent methyl isobutyl ketone and other solvent streams from the material deposited on the belt filters. The resultant crude Penicillin V is reslurried prior to being processed through the second and final filter stage. A drying step completes the process.

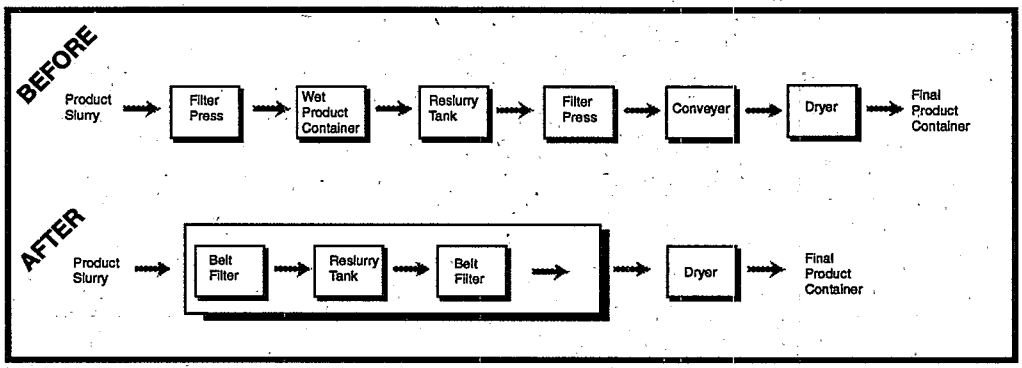


Exhibit 8

Final Crude Product Processing Steps Before and After Incorporation of the Belt Filters Project

The two belt filters are totally enclosed and operate in a continuous loop. Automatic controls allow operation of the system without manual intervention except in case of emergency. The belt filter interiors operate under negative pressure in a nitrogen atmosphere in order to improve process efficiency and reduce solvent emissions. Not only does this belt filter design effectively reduce methyl isobutyl ketone emissions, but it also reduces the use of other TRI chemical solvents in the washing cycles by more than 20 percent. A dedicated carbon adsorber unit captures the methyl isobutyl ketone and other solvents from the filters for reuse in the production process.

Bristol-Myers Squibb purchased and installed the belt filters at its Syracuse facility in 1990. The company estimates that the Belt Filters project has reduced releases and transfers of methyl isobutyl ketone by approximately 500,000 pounds and other TRI chemical solvents by approximately 350,000 pounds compared to 1988 levels. In addition, this project has reduced employee exposure to solvents and fire hazard risks because the new system operates under negative pressure in a nitrogen atmosphere. The company invested $2 million in this project which saves approximately $800,000 per year in material, utilities, and labor costs.

The company invested $2 million in the Belt Filters project which saves approximately $800,000 per year in material, utilities, and labor costs.

33/50 Progress and TRI Data Summary

Bristol-Myers Squibb has reduced releases and transfers of 33/50 Program chemicals by 2,611,173 pounds or 54 percent from 1988 to 1993. The company has already achieved its 1995 33/50 Program goal of a 50 percent reduction in releases and transfers two years ahead of schedule. Exhibit 9

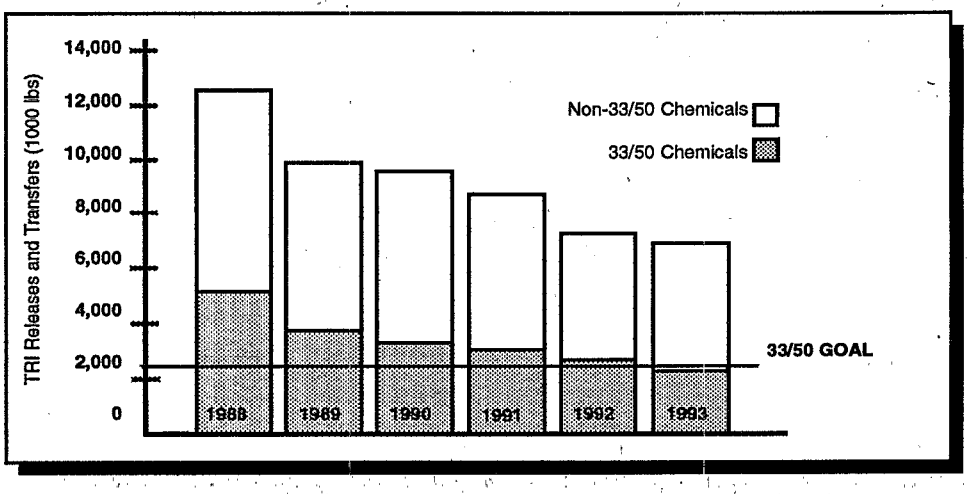


Exhibit 9

Bristol-Myers Squibb's Progress Towards Meeting its 33/50 Goals

shows the company's progress from 1988 to 1993 in reducing releases and transfers of 33/50 Program and other TRI chemicals, and Exhibits 10 and 11 illustrate 1993 releases and transfers of 33/50 Program chemicals by chemical and by release media, respectively. The two activities discussed in this profile have reduced releases and transfers of 33/50 Program chemicals by 1,250,000 pounds or 26 percent. A number of other projects accounted for the balance of the reductions including solvent elimination or substitution, solvent recovery efficiency improvements, leak detection and repair, chemical storage improvements such as conservation vents, nitrogen blanketing, and as a last resort, end of pipe emission controls such as thermal destruction of air releases. In addition, the Pharmaceutical Manufacturing Division in Evansville, Indiana and New Brunswick, New Jersey has replaced dichloromethane as the solvent in external coating operations of vitamin tablets manufacturing with an aqueous-based system. The company achieved part of its 33/50 Program goals with projects already in place prior to the company's joining the 33/50 Program.

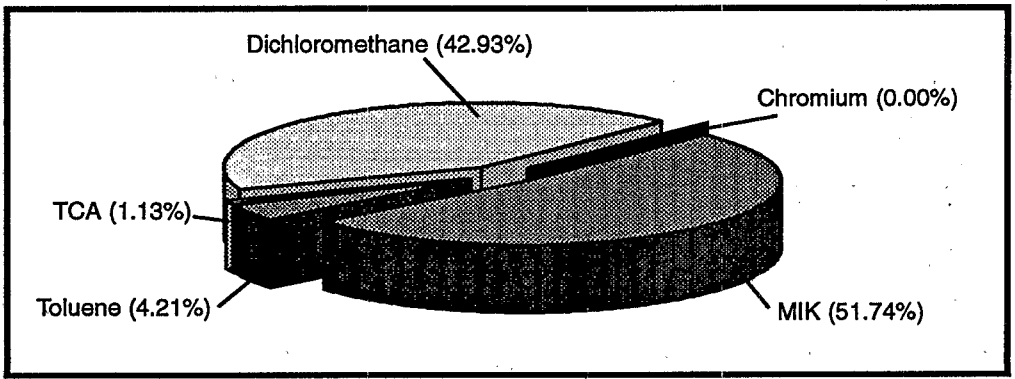


Exhibit 10

Bristol-Myers Squibb Company 33/50 Program Chemical Releases & Transfers (1993)

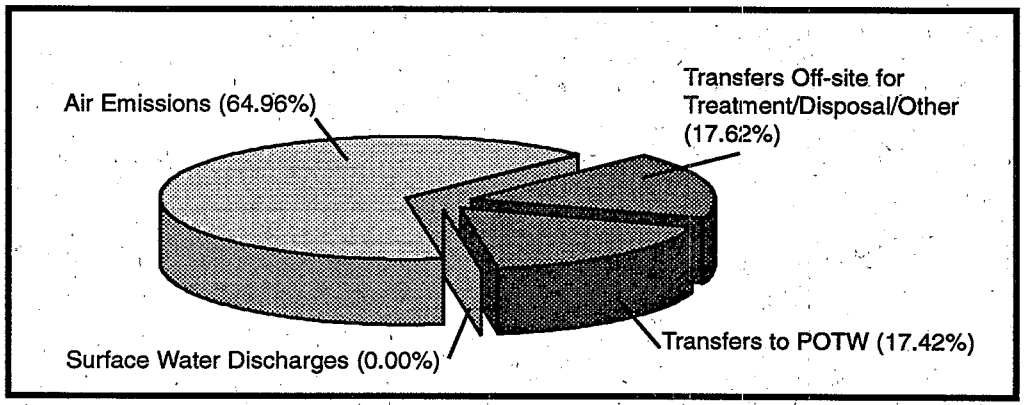


Exhibit 11

Bristol-Myers Squibb Company Releases & Transfers of 33/50 Program Chemicals by Media (1993)

Since signing onto the program in 1991, Bristol-Myers Squibb's experience with the Program has been positive. The 33/50 Program has provided a conceptual framework for the company to concentrate and implement its pollution prevention activities in a nationally recognized program of voluntary reductions and cooperation between the government and industry. In short, it focused and accelerated the company's efforts to achieve its reductions.

In addition to its reductions of 33/50 Program chemicals, the company also achieved reductions of 2,873,730 pounds or 39 percent in releases and transfers of non-33/50 TRI chemicals between 1988 and 1993. As noted in its summary of Pollution Prevention Act performance, presented in Appendix E, the company also reduced its total production-related waste of all TRI chemicals by 1,406,036 pounds or 18 percent from 1992 to 1993 and it predicts further reductions in all of its waste management activities at higher production levels. Production related waste includes not only releases and transfers off-site, but also on-site recycling and treatment. The company estimates that it will reduce total production-related waste by approximately 3.0 million pounds, or 47 percent, for 33/50 Program Chemicals between 1993 and 1995. It also predicts a reduction in production-related waste for all TRI chemicals of approximately 5.9 million pounds. This projected reduction in production-related waste at existing or higher production levels indicates that the company plans to implement additional pollution prevention activities in 1995, the concluding year of the 33/50 Program, and that the company's contributions to the program will exceed its current achievement level.

The 33/50 Program has focused and accelerated the company's efforts to achieve its reductions.

FUTURE CHALLENGES

Bristol-Myers Squibb believes that implementation of the product life cycle approach across its business groups will achieve additional environmental improvements in the next few years. Because of the diverse and decentralized nature of the company, each of its four business groups has its own environmental issues to manage. One major project put in place late in 1994 at the Syracuse facility, similar to the belt filter project discussed in this case study, improves the extraction process of the Penicillin V manufacturing operations. The company expects significant reductions in releases and transfers of methyl

Because of the diverse and decentralized nature of the company, each of its four business groups has its own environmental issues to manage.

isobutyl ketone as a result of this project, although the impact and benefits of this project will not be observed until the system is fully operational and the 1994 and 1995 TRI data are compiled. Other efforts to reduce use and releases of toxic chemicals include enzyme technology development to substitute for toxic chemical use, end of pipe controls, and process and equipment changes at the company's manufacturing operations to further reduce fugitive air emissions.

Environment 2000, now instituted worldwide, is leading to not only significant high-profile EHS projects, but also integration of EHS into the company's basic operating functions. Dividends paid from this integration include, most importantly, a focus on continuous EHS improvement by Bristol-Myers Squibb employees worldwide, as well as improved productivity.

Contact for Further Information

For additional information on any of the information provided in this case study, please contact the following individual:

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Appendix A

International Chamber of Commerce Business Charter for Sustainable Development: Principles for Environmental Management

1. **Corporate Priority**: *To recognize environmental management as among the highest corporate priorities and as a key determinant to sustainable development; to establish policies, programs and practices for conducting operations in an environmentally sound manner.*

2. **Integrated Management**: *To integrate these policies, programs and practices fully into each business as an essential element of management in all its functions.*

3. **Process of Improvement**: *To continue to improve corporate policies, programs and environmental performance, taking into account technical developments, scientific understanding, consumer needs and community expectations, with legal regulations as a starting point; and to apply the same environmental criteria internationally.*

4. **Employee Education**: *To educate, train and motivate employees to conduct their activities in an environmentally responsible manner.*

5. **Prior Assessment**: *To assess environmental impacts before start ing a new activity or project and before decommissioning a facility or leaving a site.*

6. **Products and Services**: *To develop and provide products or services that have no undue environmental impact and are safe in their intended use, that are efficient in their consumption of energy and natural resources, and that can be recycled, reused, or dis posed of safely.*

7. **Customer Advice**: *To advise, and where relevant educate, customers, distributors and the public in the safe use, transportation, storage and disposal of products provided; and to apply similar considerations to the provision of services.*

8. **Facilities and Operations**: *To develop, design and operate facilities and conduct activities taking into consideration the efficient use of energy and materials, the sustainable use of renewable*

resources, the minimization of adverse environmental impact and waste generation, and the safe and responsible disposal of wastes.

9. **Research**: *To conduct or support research on the environmental impacts of raw materials, products, processes, emissions and wastes associated with the enterprise and on the means of minimizing such adverse impacts.*

10. **Precautionary Approach**: *To modify the manufacture, marketing or use of products or services or the conduct of activities, consistent with scientific and technical understanding, to prevent serious or irreversible environmental degradation.*

11. **Contractors and Suppliers**: *To promote the adoption of these principles by contractors acting on behalf of the enterprise, encouraging and, where appropriate, requiring improvements in their practices to make them consistent with those of the enterprise; and to encourage the wider adoption of these principles by suppliers.*

12. **Emergency Preparedness**: *To develop and maintain, where significant hazards exist, emergency preparedness plans in conjunction with the emergency services, relevant authorities and the local community, recognizing potential transboundary impacts.*

13. **Transfer of Technology**: *To contribute to the transfer of environmentally sound technology and management methods throughout the industrial and public sectors.*

14. **Contributing to the Common Effort**: *To contribute to the development of public policy and to business, governmental and intergovernmental programs and educational initiatives that will enhance environmental awareness and protection.*

15. **Openness to Concerns**: *To foster openness and dialog with employees and the public, anticipating and responding to their concerns about the potential hazards and impacts of operations, products, wastes or services, including those of a transboundary or global significance.*

16. **Compliance and Reporting**: *To measure environmental performance; to conduct regular environmental audits and assessments of compliance with company requirements, legal requirements and these principles; and periodically to provide appropriate information to the Board of Directors, shareholders, employees, the authorities and the public.*

Appendix B

Bristol-Myers Squibb Corporate Purchasing Guidelines

(Adopted 8 August 1991)

It is company policy to protect the health, safety and quality of life of its employees and the public, and to exercise responsible stewardship of natural resources that may be impacted by Company activities.

Without compromising the quality and competitiveness of our products or workplace, Purchasing is to share in the responsibility for minimizing any adverse environmental impact directly associated with materials and services purchased by the Company.

At a minimum, no purchasing decisions should be made before considering the following:

Source Reduction: *Can less material be used through value analysis?*

Recycled Availability: *Is the item available in recycled form?*

Recyclability/Reusability: *Is the item recyclable or reusable, or can it become so given sufficient demand?*

Renewable Resources: *Can the material be replaced by an environmentally preferable renewable resource?*

Hazard Reduction: *Can a less hazardous material be substituted?*

Process Waste Reduction: *Can in-process waste be generated by the material or its use be minimized?*

Handling and Disposal: *Does the item, its intermediaries or wastes require special handling and/or disposal?*

Environmental Technology: *Does the item incorporate environmentally preferable technology?*

Energy Efficiency: *Have products, processes and waste disposdisposal associated with the item been evaluated relative to environmental and financial energy costs?*

Suppliers: *Does the supplier share the Company's environmental goals and objectives, or can the Company's purchasing requirements be used to encourage a supplier to improve its environmental sensitivity?*

Towards the successful implementation of these guidelines, Purchasing is expected to:

Stay abreast of relevant product-related environmental information, innovations, and trends.

Work closely with Company clients to identify environmentally preferable purchasing options.

Notify and regularly update suppliers as to the Company's environmental commitment and objectives.

Any questions or requests for information regarding these Guidelines should be directed to your local Purchasing organization.

Appendix C
Bristol-Myers Squibb Company
Releases and Transfers of TRI Chemicals, 1988-1993

Chemical	Year	Total Air Emissions (pounds)	Surface Water Discharges (pounds)	Releases to Land (pounds)	Transfers to POTW (pounds)	Transfers Off-site for Treatment/ Disposal/Other (pounds)	Total Releases and Transfers (pounds) (1)	Percent Change 1988-1993 Total Releases and Transfers
Chromium	1988	0	0	250	250	250	750	
	1989	0	0	0	250	250	500	
	1990	0	0	0	5	5	10	
	1991	0	0	0	5	5	10	
	1992	0	0	0	5	5	10	
	1993	0	0	0	5	5	10	-99%
Dichloromethane	1988	1,763,347	0	0	428,560	179,903	2,371,810	
	1989	1,204,795	0	750	94,800	200,410	1,500,755	
	1990	1,021,050	0	0	70,620	114,910	1,206,580	
	1991	600,670	500	0	174,030	384,950	1,160,150	
	1992	510,310	255	0	139,220	250,300	900,085	
	1993	544,980	0	0	93,820	333,540	972,340	-59%
Methyl ethyl ketone	1988	800	0	0	100	0	900	
Methyl isobutyl ketone	1988	1,481,240	0	0	400,500	343,520	2,225,260	
	1989	1,290,550	0	0	220,100	84,891	1,595,541	
	1990	1,363,955	0	0	220,510	30,300	1,614,765	
	1991	1,295,305	500	0	292,130	251	1,588,186	
	1992	894,705	255	0	448,220	14,845	1,358,025	
	1993	848,700	5	0	300,210	22,821	1,171,736	-47%
Nickel	1988	0	0	250	0	250	500	
Toluene	1988	48,092	0	0	26,200	37,000	111,292	
	1989	35,566	0	0	7,950	63,050	106,566	
	1990	53,745	0	0	9,450	36,900	100,095	
	1991	47,905	250	0	9,450	41,100	98,705	
	1992	28,475	250	0	5,150	88,390	122,265	
	1993	52,024	0	0	600	42,623	95,247	-14%

Appendix C

Bristol-Myers Squibb Company

Releases and Transfers of TRI Chemicals, 1988-1993

Chemical	Year	Total Air Emissions (pounds)	Surface Water Discharges (pounds)	Releases to Land (pounds)	Transfers to POTW (pounds)	Transfers Off-site for Treatment/ Disposal/Other (pounds)	Total Releases and Transfers (pounds) (1)	Percent Change 1988-1993 Total Releases and Transfers
1,1,1-Trichloroethane	1988	165,490	0	0	0	0	165,490	
	1989	121,327	0	0	0	32,000	153,327	
	1990	122,477	0	0	0	36,632	159,109	
	1991	54,761	0	0	0	17,496	72,257	
	1992	51,702	0	0	0	0	51,702	
	1993	25,496	0	0	0	0	25,496	-85%
Xylene (mixed isomers)	1990	1,950	0	0	1,500	0	3,450	
	1991	1,205	0	0	1,100	250	2,555	
	1992	6,405	0	0	1,560	250	8,215	
33/50 Program Chemicals	1988	3,458,969	0	500	855,610	560,923	4,876,002	
	1989	2,652,238	0	750	323,100	380,601	3,356,689	
	1990	2,563,177	0	0	302,085	218,747	3,084,009	
	1991	1,999,846	1,250	0	476,715	444,052	2,921,863	
	1992	1,491,597	760	0	594,155	353,790	2,440,302	
	1993	1,471,200	5	0	394,635	398,989	2,264,829	-54%
Methanol	1988	572,672	0	0	239,310	201,426	1,013,408	
	1989	464,020	0	0	194,210	57,362	715,592	
	1990	588,450	250	0	185,860	82,731	857,291	
	1991	560,650	10,000	0	85,650	6,210	662,510	
	1992	265,020	4,300	0	109,550	157,435	536,305	
	1993	181,810	5	0	93,480	122,281	397,576	-61%
Non-33/50 Program Chemicals	1988	3,708,940	0	0	2,449,406	1,276,852	7,435,198	
	1989	3,716,444	0	0	2,460,315	982,340	7,159,099	
	1990	4,498,308	500	0	2,557,370	264,522	7,320,700	
	1991	4,171,379	13,050	0	1,926,361	69,688	6,180,478	
	1992	3,067,020	10,400	0	1,467,523	344,253	4,889,196	
	1993	2,659,754	260	0	1,373,187	528,267	4,561,468	-39%

Appendix C
Bristol-Myers Squibb Company
Releases and Transfers of TRI Chemicals, 1988-1993

Chemical	Year	Total Air Emissions (pounds)	Surface Water Discharges (pounds)	Releases to Land (pounds)	Transfers to POTW (pounds)	Transfers Off-site for Treatment/ Disposal/Other (pounds)	Total Releases and Transfers (pounds) (1)	Percent Change 1988-1993 Total Releases and Transfers
All TRI Chemicals	1988	7,167,909	0	500	3,305,016	1,837,775	12,311,200	
	1989	6,368,682	0	750	2,783,415	1,362,941	10,515,788	
	1990	7,061,485	500	0	2,859,455	483,269	10,404,709	
	1991	6,171,225	14,300	0	2,403,076	513,740	9,102,341	
	1992	4,558,617	11,160	0	2,061,678	698,043	7,329,498	
	1993	4,130,954	265	0	1,767,822	927,256	6,826,297	-40%
Percent Change, 1988-1993								
33/50 Program Chemicals		-57%	---	-100%	-54%	-29%	-54%	
Non-33/50 Program chemicals		-28%	---	---	-44%	-59%	-39%	
All TRI Chemicals		-42%	---	-100%	-47%	-50%	-45%	

(1) Total Releases and Transfers for 1991, 1992 and 1993 do not include on- or off-site recycling or energy recovery.

NOTE: For 1991, Bristol-Myers Squibb Syracuse, NY, facility had submitted revisions to EPA which were mistakenly omitted from the Public Database. The Data as submitted by the facility appear on this Table.

Appendix D
Bristol-Myers Squibb Company
Releases and Transfers of TRI Chemicals, 1988-1993

Facility	Chemical	Year	Total Air Emissions (pounds)	Surface Water Discharges (pounds)	Underground Injection (pounds)	Releases to Land (pounds)	Transfers to POTW (pounds)	Transfers Off-site for Treatment/ Disposal/Other (pounds)	Total Releases and Transfers (pounds) (1)	Percent Change 1988-1993 Total Releases & Transfers
BRISTOL-MYERS SQUIBB CO. - SYRACUSE, NY	Dichloromethane	1988	560,000	0	0	0	390,000	55,000	1,005,000	
		1989	260,000	0	0	0	50,000	66,500	376,500	
		1990	300,000	0	0	0	22,000	39,000	361,000	
		1991	162,000	500	0	0	20,000	59,800	242,300	
		1992	225,000	255	0	0	4,900	30,200	260,355	
		1993	126,000	0	0	0	9,900	32,200	168,100	-83%
	Methyl isobutyl ketone	1988	1,430,000	0	0	0	400,000	217,000	2,047,000	
		1989	1,230,000	0	0	0	220,000	52,800	1,502,800	
		1990	1,330,000	0	0	0	220,000	900	1,550,900	
		1991	1,275,000	500	0	0	291,000	0	1,566,500	
		1992	883,000	255	0	0	447,000	5	1,330,260	
		1993	845,000	5	0	0	299,000	750	1,144,755	-44%
	Toluene	1988	380	0	0	0	26,000	5,800	32,180	
		1989	380	0	0	0	7,700	14,600	22,680	
		1990	445	0	0	0	9,200	300	9,945	
		1991	1,900	250	0	0	8,700	700	11,550	
		1992	6,100	250	0	0	4,400	2,200	12,950	
		1993	450	0	0	0	350	2,300	3,100	-90%

Appendix D
Bristol-Myers Squibb Company
Releases and Transfers of TRI Chemicals, 1988-1993

Facility	Chemical	Year	Total Air Emissions (pounds)	Surface Water Discharges (pounds)	Underground Injection (pounds)	Releases to Land (pounds)	Transfers to POTW (pounds)	Transfers Off-site for Treatment/ Disposal/Other (pounds)	Total Releases and Transfers (pounds) (1)	Percent Change 1988-1993 Total Releases & Transfers
	33/50 Program Chemicals	1988	1,990,380	0	0	0	816,000	277,800	3,084,180	
		1989	1,490,380	0	0	0	277,700	133,900	1,901,980	
		1990	1,630,445	0	0	0	251,200	40,200	1,921,845	
		1991	1,438,900	1,250	0	0	319,700	60,500	1,820,350	
		1992	1,114,100	760	0	0	456,300	32,405	1,603,565	
		1993	971,450	5	0	0	309,250	35,250	1,315,955	-57%
	Methanol	1988	504,000	0	0	0	200,000	59,000	763,000	
		1989	391,000	0	0	0	190,000	16,800	597,800	
		1990	444,000	250	0	0	180,000	4,900	629,150	
		1991	471,000	10,000	0	0	82,000	1,900	564,900	
		1992	232,000	4,300	0	0	108,000	1,300	345,600	
		1993	93,000	5	0	0	91,600	0	184,605	-76%
	Non-33/Program Chemicals	1988	3,008,133	0	0	0	2,093,050	525,100	5,626,283	
		1989	3,019,233	0	0	0	2,263,300	416,500	5,699,033	
		1990	3,314,793	500	0	0	2,119,600	11,000	5,445,893	
		1991	3,040,597	13,050	0	0	1,713,800	5,200	4,772,647	
		1992	2,313,397	10,400	0	0	1,223,600	2,880	3,550,277	
		1993	2,280,852	260	0	0	1,230,500	130	3,511,742	-38%

Appendix D

Bristol-Myers Squibb Company

Releases and Transfers of TRI Chemicals, 1988-1993

Facility	Chemical	Year	Total Air Emissions (pounds)	Surface Water Discharges (pounds)	Underground Injection (pounds)	Releases to Land (pounds)	Transfers to POTW (pounds)	Transfers Off-site for Treatment/ Disposal/Other (pounds)	Total Releases and Transfers (pounds) (1)	Percent Change 1988-1993 Total Releases & Transfers
	All TRI Chemicals	1988	4,998,513	0	0	0	2,909,050	802,900	8,710,463	
		1989	4,509,613	0	0	0	2,541,000	550,400	7,601,013	
		1990	4,945,238	500	0	0	2,370,800	51,200	7,367,738	
		1991	4,479,497	14,300	0	0	2,033,500	65,700	6,592,997	
		1992	3,427,497	11,160	0	0	1,679,900	35,285	5,153,842	
		1993	3,252,302	.265	0	0	1,539,750	35,380	4,827,697	-45%

(1) 1991, 1992 and 1993 Total Releases and Transfers do not include transfers off-site for recycling and energy recovery.

Appendix E

Bristol-Myers Squibb Company

Pollution Prevention Act Reporting, 1991-1993 Data and 1994-1995 Projections

Chemical	Year	Recycled On-Site (pounds)	Recycled Off-Site (pounds)	Energy Recovery On-Site (pounds)	Energy Recovery Off-Site (pounds)	Treated On-Site (pounds)	Treated Off-Site (pounds)	Quantity Released (pounds)	Percent Change 1991-1995 Quantity Released	Total Production Related Wastes (pounds)	Percent Change 1991-1995 Production Related Wastes
Chromium	1991	0	0	0	0	5	5	5		15	
	1992	0	0	0	0	5	5	5		15	
	1993	0	0	0	0	5	5	5		15	
	1994	0	0	0	0	5	5	5		15	
	1995	0	0	0	0	5	5	5	0%	15	0%
Dichloromethane	1991	0	0	0	63,100	3,775,500	558,550	600,750		4,997,900	
	1992	0	64,900	0	26,300	2,814,670	388,670	450,740		3,745,280	
	1993	0	0	0	34,500	2,286,220	427,220	544,730		3,292,670	
	1994	0	0	0	20,000	1,533,830	445,600	352,800		2,352,230	
	1995	0	0	0	20,000	1,700,500	445,600	334,800	-44%	2,500,900	-50%
Methyl isobutyl ketone	1991	0	0	0	130,250	754,300	292,130	1,295,500		2,472,180	
	1992	0	0	0	30,260	627,630	462,940	893,730		2,014,560	
	1993	0	0	0	990	558,430	323,180	847,590		1,730,190	
	1994	0	0	0	1,000	274,000	355,780	853,400		1,484,180	
	1995	0	0	0	1,000	119,450	282,500	402,800	-69%	805,750	-67%
Toluene	1991	0	0	0	66,400	820	44,250	54,100		165,570	
	1992	0	0	0	19,400	460	82,480	38,970		141,310	
	1993	0	0	0	87,600	820	44,970	57,500		190,890	
	1994	0	0	0	241,800	1,860	33,810	50,000		327,470	
	1995	0	0	0	39,800	400	25,800	43,400	-20%	109,400	-34%

Appendix E
Bristol-Myers Squibb Company
Pollution Prevention Act Reporting, 1991-1993 Data and 1994-1995 Projections

Chemical	Year	Recycled On-Site (pounds)	Recycled Off-Site (pounds)	Energy Recovery On-Site (pounds)	Energy Recovery Off-Site (pounds)	Treated On-Site (pounds)	Treated Off-Site (pounds)	Quantity Released (pounds)	Percent Change 1991-1995 Quantity Released	Total Production Related Wastes (pounds)	Percent Change 1991-1995 Production Related Wastes
1,1,1-Trichloroethane	1991	0	25,050	0	17,000	0	0	60,020		102,070	
	1992	1,832,725	13,573	0	0	0	0	62,260		1,908,558	
	1993	1,147,080	25,598	0	0	0	0	42,294		1,214,972	
	1994	0	6,600	0	0	0	0	6,980		13,580	
	1995	0	550	0	0	0	0	80	-100%	630	-99%
Xylene (mixed isomers)	1991	0	0	0	37,900	200	1,100	1,200		40,400	
	1992	0	0	0	48,960	20	1,810	6,400		57,190	
	1993	0	0	0	30,320	20	900	900		32,140	
	1994	0	0	0	15,000	10	800	1,000		16,810	
	1995	0	0	0	0	0	0	0	-100%	0	-100%
33/50 Program Chemicals	1991	0	25,050	0	314,650	4,530,825	896,035	2,011,575		7,778,135	
	1992	1,832,725	78,473	0	124,920	3,442,785	935,905	1,452,105		7,866,913	
	1993	1,147,080	25,598	0	153,410	2,845,495	796,275	1,493,019		6,460,877	
	1994	0	6,600	0	277,800	1,809,705	835,995	1,264,185		4,194,285	
	1995	0	550	0	60,800	1,820,355	753,905	781,085	-61%	3,416,695	-56%
Methanol	1991	0	0	0	286,090	2,944,540	93,103	575,300		3,899,033	
	1992	0	0	0	107,860	2,760,150	270,630	269,650		3,408,290	
	1993	0	0	0	25,300	2,432,476	220,160	185,244		2,863,180	
	1994	0	0	0	24,000	1,924,100	307,100	189,400		2,444,600	
	1995	0	0	0	24,000	1,847,000	303,000	185,700	-68%	2,359,700	-39%

Appendix E

Bristol-Myers Squibb Company

Pollution Prevention Act Reporting, 1991-1993 Data and 1994-1995 Projections

Chemical	Year	Recycled On-Site (pounds)	Recycled Off-Site (pounds)	Energy Recovery On-Site (pounds)	Energy Recovery Off-Site (pounds)	Treated On-Site (pounds)	Treated Off-Site (pounds)	Quantity Released (pounds)	Percent Change 1991-1995 Quantity Released	Total Production Related Wastes (pounds)	Percent Change 1991-1995 Production Related Wastes
Non-33/50 Program Chemicals	1991	2,232,745	440,480	0	1,895,966	15,462,966	2,522,412	4,302,246		26,856,815	
	1992	2,006,403	24,844	0	943,467	14,263,461	3,029,855	3,104,702		23,372,732	
	1993	102,252	7,130	0	488,168	12,572,990	3,108,805	2,687,006		18,966,351	
	1994	104,580	5,130	0	533,468	11,930,427	1,924,760	2,529,708		17,028,073	
	1995	96,700	5,610	0	477,584	11,360,994	1,868,242	2,264,037	-47%	16,073,167	-40%
All TRI Chemicals	1991	2,232,745	465,530	0	2,210,616	19,993,791	3,418,447	6,313,821		34,634,950	
	1992	3,839,128	103,317	0	1,068,387	17,706,246	3,965,760	4,556,807		31,239,645	
	1993	1,249,332	32,728	0	641,578	15,418,485	3,905,080	4,180,025		25,427,228	
	1994	104,580	11,730	0	811,268	13,740,132	2,760,755	3,793,893		21,222,358	
	1995	96,700	6,160	0	538,384	13,181,349	2,622,147	3,045,122	-52%	19,489,862	-44%
Percent Changes, 1991-1995											
33/50 Program chemicals		---	-98%	---	-81%	-60%	-16%	-61%		-56%	
Non-33/50 Program chemicals		-96%	-99%	---	-75%	-27%	-26%	-47%		-40%	
All TRI Chemicals		-96%	-99%	---	-76%	-34%	-23%	-52%		-44%