

Pollution Prevention Report

A.R.S. §49-966

The Pollution Prevention Program is proactive in its unique approach to environmental protection. Rather than using a “control by permitting and enforcement approach,” pollution prevention (P2) allows industry and government to work together to find ways to use fewer or smaller quantities of toxic chemicals, save money, and protect public health and the environment.

The program certifies acceptable comprehensive P2 plans and annual reports from regulated facilities and maintains information on toxic use, pollutant releases, hazardous waste generation, P2 plans, goals and methods. The department works directly with businesses to develop and pursue methods to:

- Eliminate chemicals
- Substitute with less hazardous substances
- Change or improve manufacturing processes
- Increase recycling
- Improve control of chemical inventory or purchasing and prevent spills and leaks before they occur

The Pollution Prevention Program’s mission is to protect public health and the environment by eliminating or reducing the use of toxic substances and the generation of hazardous waste. While this program is administratively located in the Waste Programs Division, it is a multimedia program, that addresses hazardous substance releases to air and water in addition to hazardous waste generation.

The Pollution Prevention Program’s multimedia approach helps Arizona’s large hazardous waste generators and toxic substance users to reduce hazardous waste, toxic substance use and pollutant releases. The program helps the state meet its federal hazardous waste management capacity assurance requirements by directly reducing hazardous waste. Also, the program helps Arizona meet the statewide waste minimization goal mandated by A.R.S. § 49-963.A.

P2 is an innovative environmental management practice within the department. By successfully creating new methods for reducing toxic chemical use and reducing hazardous waste before it is generated, P2 methods are frequently proving to be the best environmental management options available. Using P2 to improve production processes can be quite affordable, save money and provide a rapid return on investment. In contrast, pollution control solutions always remain an operating cost, provide no investment return and imposes liabilities.

In summary, the purpose of the department’s Pollution Prevention Program is to

promote and encourage this visionary and innovative management strategy through a variety of goals, objectives, initiatives and strategies to enhance acceptance of the P2 process by regulated facilities.

The objectives of the Pollution Prevention Program are:

- To promote the visionary paradigm of achieving environmental compliance through P2
- To foster the development of strategic partnerships, innovative programs, and education (through outreach and technical assistance) to convey information to P2 practitioners
- To promote the social and economic advantages of P2 as a good management practice for all sectors of business, including public and private manufacturing and service industries
- To support the elimination of barriers to P2 in environmental legislation and regulations
- To promote the integration of P2 concepts into educational programs, forums, environmental stewardship meetings and regulatory programs

To meet these objectives, ADEQ must ensure that facilities can perform facility assessments, implement P2 and benefit from resultant cost savings. In this context, the department has implemented these multifaceted initiatives:

- Promoting strategies to minimize the quantity of toxic substances used or hazardous waste generated. This includes on-site P2 assistance to industry and government and technical information sharing with the regulated facilities
- Initiating partnerships to encourage P2
- Conducting P2 training to facilities and government agencies
- Creating and distributing P2 techniques through guides, videos, booklets and brochures
- Providing incentives for facilities with P2 plans (50 percent fee discount for hazardous waste shipped off-site or disposed)
- Focusing on multimedia environmental issues (e.g., P2 in building construction (including schools), boating and marina P2 on the Verde and Colorado watersheds, and P2 along the Arizona-Mexico border)
- Competing for EPA's P2 grants to increase P2 success

To implement the P2 initiatives the Pollution Prevention Program encourages businesses to use following P2 strategies.

- Process or equipment modifications
- Production planning and sequencing
- Chemical substitution or elimination
- Loss, spill and leak prevention and improved housekeeping practices
- Waste segregation and separation
- Closed-loop and other recycling

- Reduction in energy use
- Training of environmental managers and their staff members

Arizona's successful Pollution Prevention Program continues to reduce the exposure of industry workers, the public and the environment to health and safety hazards by facilitating the reduction of over 180 million pounds of hazardous waste since 1991. In addition, the implementation of P2 in Arizona has:

- Created a positive problem solving atmosphere for participating facilities and government agencies
- Saved Arizona businesses thousands of dollars
- Reduced the regulatory burden for agencies and businesses who have achieved and implemented P2
- Improved the environment and public health

As shown in Figure 1, P2 can be compared to other concepts of environmental management. The figure shows that the higher up the hierarchy of environmental management, the better the result in achieving sustainable development. The department's vision statement includes promotion of a sustainable environment and economy. Practices higher up also include the practices below it but add additional elements of scope and complexity. Although P2 and cleaner production are very similar, they are separated here because cleaner production includes a focus on product design and life cycle rather than just the manufacturing process. Arizona's P2 regulations do not include product design and product life cycle reviews. Figure 1 also shows that P2 represents a major milestone in on the path to achieving a sustainable economy.

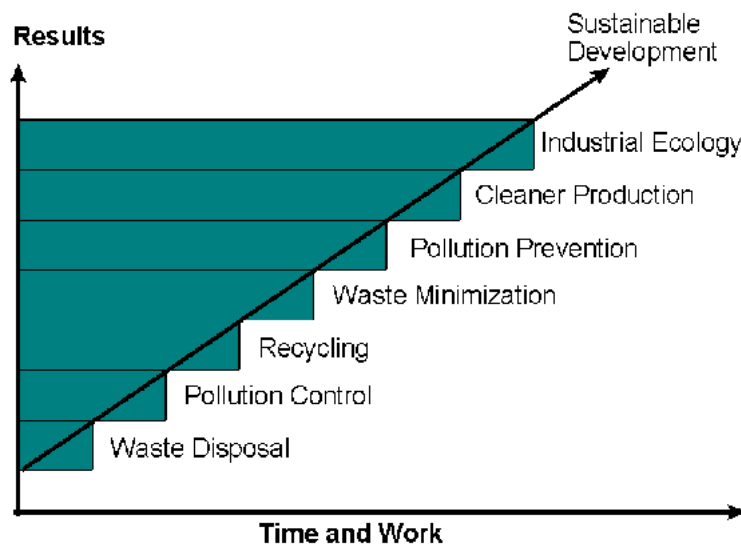


Figure 1: Concepts in Industrial Environmental Management (Adopted from W. Burton Hamner, MBA, MMA Adjunct Professor, Operations and Environmental Management, Asian Institute of Management)

Arizona Trends in Hazardous Waste Generation and Chemical Releases

Within the context of sustainable development, it is relevant to see the Arizona trends in hazardous waste generation and chemical releases. The trends can be used to indicate the direction P2 implementation is heading EPA's toxic release inventory (TRI) reports and department data from P2 plans were used to identify trends in P2. Because the TRI program has been adding more facilities and chemicals to the program, it is now more difficult to use them as a comparative measurement tool. The reports are useful because they still contain information that shows decreases in air releases for Arizona.

Additional data reported on Arizona's P2 plan annual reports show a decrease in hazardous waste generation.

The data provide positive indications of reductions in toxic chemicals released to air, especially considering the industrial growth since 1991. As Arizona's industry base grows, new facilities and increased production from existing facilities will continue to challenge the environment and increase the quantities of new chemicals used. To sustain these gains, the department must continue to educate new industries in P2 and sustainable techniques.

The TRI reports also show the states that receive Arizona TRI wastes, show the TRI wastes that Arizona sent to other states and show facility on-site air releases.

Pollution Prevention Works

Because an ounce of prevention is worth a pound of cure, P2 works. Existing pollution control approaches, such as treatment and permits, assume that safe standards can be set with confidence. However, with new knowledge often comes the identification of health risks that were previously not factored into the development of an environmental standard.

P2 is a long term program that requires educating industry about this innovative concept and sharing information between companies and between the department and industry. P2 education is provided through workshops, seminars, partnership formation, hosting site visits, classroom training and telephone help.

P2 methods simply assume that "less is better." At first glance, generating hazardous waste in some service and industrial operations may appear unavoidable, but with P2 focus, interventions often prove to be technically and economically discoverable and feasible. The following sections describe the activities of the Pollution Prevention Program to encourage P2, the status of the toxic data reports and other information pertinent to P2 in Arizona.

Activities to Encourage Pollution Prevention

Workshops and Conferences

The department recognizes that information sharing about P2 accomplishments will promote greater success in carrying out P2. To produce such success, the department encourages, develops and participates in P2 workshops and conferences. Many environmental and business professionals attended the P2 workshops and conferences listed in Table 1.

<i>Table 1: Workshops and Conferences</i>		
Event/Audience	Topics/Activities	Location
August 2001		
Leadership in Energy and Environmental design workshop	Energy efficient, low chemical, green building design	Tucson
September 2001		
Spray painters from various Arizona businesses	Workshop on regulations and P2 for spray coatings (paint)	Phoenix
October 2001		
AZ Regulatory Round-Up	Environmental regulations overview air permitting and reporting; water discharge permitting; implementation of environmental management systems; bio-diesel fuel, etc.	Phoenix
Western Regional Pollution Prevention Conference	P2 conference and green business meetings	Santa Rosa, Calif.
Arizona state , various city vehicle fleet managers	Use of bio-fuels in lieu of diesel fuel in P2 trucks to reduce particulates and emissions as a P2 measure	Phoenix
November 2002		
Western Regional Pollution Prevention Roundtable	Environmental grant writing workshop, autobody refinishing P2 workshop, P2 in watershed and water conservation workshop	Santa Rosa, Calif.

<i>Table 1: Workshops and Conferences</i>		
Event/Audience	Topics/Activities	Location
February 2002		
Southern AZ Environmental Management Society Conference	Hazardous waste regulations, waste management, P2 information display booth	Tucson
Council of Educational Planners (CEFPI) Green Schools Workshop	Sustainable Schools – Design to Learn: discussed pertinent issues regarding environmentally sustainable schools, such as project goals, sustainable design process and elements, climate conditions, etc.; DoE undersecretary David Garman spoke at the workshop to announce a new design guide for schools	Las Vegas, Nev.
Arizona Green Building Conference	The first green building conference in Phoenix; discussed various aspects of environmental improvements and P2 in building and housing design to reducing environmental impact	Phoenix
Green Chemistry Pollution Prevention Conference	Conference focused on technologies for cleaner, cheaper, smarter chemistry	Washington, DC

Speakers Bureau

The department encourages P2 efforts and provides P2 training to industry by speaking at environmental events, and providing information about implementing P2, waste minimization and increasing environmental leadership including:

<i>Table 2: Speakers Bureau Activities</i>			
Event/Audience	Topics/Activities	Location	Date
Environmental professionals taking a hazardous waste and compliance refresher course (eight hours or 16 hours through ASU. Program meets training requirements of 40 CFR 265.16(c) or 40 CFR 265.16(a)(1).	Presented Arizona P2 program requirements and technical aspects, as a section of this class	Tempe (ASU)	8/01 11/01

Table 2: Speakers Bureau Activities

Event/Audience	Topics/Activities	Location	Date
Members of the Mohave County Chapter of the Arizona Automotive Services Association	Presentation on P2 presentation techniques for automotive repair shops	Kingman	9/01
Attendees at the Southern Arizona Environmental Management Society Annual Conference – P2 Without Borders	Presentation on RCRA PBT chemicals and the waste minimization national plan; presentation on P2 basics	Tucson	10/01
Members of the U of A Agriculture Extension Department	Presented multimedia educational tools developed by University of Connecticut (non-point education for municipal officials)	Tucson	12/01
Officers of the Verde Valley Chapter of the Arizona Automotive Service Association	Presentation on implementing a proposed automotive green shop program in the automotive industry for improved P2 and environmental compliance	Camp Verde	1/02
Rocky Mountain Fleet Manager's Association board meeting	Presented a proposal to develop an automotive industry green business program for environmental improvement	Phoenix	2/02
Automotive Service Association of AZ meeting-Verde Valley Chapter	Presented P2 for automotive repair shops and presented information on proposed green business pilot program for auto shops	Cottonwood	4/02

Pollution Prevention Promotion

Another aspect of the program is to introduce and promote P2 concepts to other agencies and businesses. P2 staff continues efforts to focus on special P2 programs for marinas, automotive repair and fleet repair shops, green high performance homes and buildings (energy efficient and materials wise), mines, and watershed stewardship groups.

These efforts will continue well into the future. Since 2001, ADEQ staff have organized or participated in more than 50 meetings promoting P2 in various topics. The meetings are listed in Pollution Prevention Table 3.

<i>Table 3: Pollution Prevention Promotion</i>		
Business/Agency	Purpose/Topic	Location
July 2001		
AZ Clean & Beautiful	Green business program	Tempe
Governor's Pride	Conference planning	Phoenix
Environmental Professionals of Arizona	Monthly meeting	Tempe
AZ Environmental Leadership thru Mentoring	Planning meeting	Phoenix
Maricopa County, EPA Region 9 staff, city of Yuma environmental staff	Green business program: Presentation and discussion of successful programs in Contra Costa, Sonoma Co. and Ore.	Tempe
August 2001		
AZ Environmental Leadership thru Mentoring	Planning meeting	Phoenix
EPA Region 9 staff	Green business planning	Phoenix
Governor's Pride Environmental Recognition	Conference planning	Phoenix
Discussion with green business auto and fleet vehicle programs in California	Green business planning	Phoenix
Maricopa County environmental staff	Provided info on biodiesel development	Phoenix
September 2001		
Environmental Professionals of Arizona	Conference planning	Phoenix
Meeting with EPA Region 9 staff	Green business program development	Phoenix
Environmental Professionals of Arizona	Discuss P2	Tempe
Governor's Pride	Conference planning	Phoenix

<i>Table 3: Pollution Prevention Promotion</i>		
Business/Agency	Purpose/Topic	Location
Maricopa County Small Business Environmental Assistance	Green business program development	Phoenix
Community Liaison-Mohave Co. and Northwest Advisory group from Kingman	Lend advice for a U.S. Green Building Council chapter development for Arizona	Mohave County
October 2001		
Environmental Professionals of Arizona	Conference planning	Phoenix
AZ Environmental Leadership thru Mentoring	Planning meeting on discussing ways to help businesses better understand environmental regulations	Phoenix
Governor's Environmental Pride	Conference planning	Tempe
Maricopa County	Green business program development	Phoenix
November 2001		
AZ Military Pollution Prevention Partnership	Discuss P2 implementation with military bases in Arizona	Phoenix
Governor's Environmental Pride recognition and environmental workshop	Present P2 information at a booth during the workshops.	Phoenix
City of Yuma industrial wastewater staff	Automotive green business, green shop program development	Yuma
December 2001		
U.S. Green Building Council	Initial meeting to propose forming an Arizona chapter	Scottsdale
AZ Game and Fish Department	Discuss development of a marina P2 training document development and video	Phoenix
Council for Educational Facilities Planners International discussion	Discuss joint efforts to promote environmentally efficient (green) schools in Ariz.	Scottsdale

<i>Table 3: Pollution Prevention Promotion</i>		
Business/Agency	Purpose/Topic	Location
January 2002		
Environmental Professionals of Arizona	Participate in environmental discussions	Tempe
AZ Environmental Leadership thru Mentoring	Planning meeting	Phoenix
EPA Region 9 staff	Green business program development conference call	Phoenix
Environmental Professionals of Arizona	Board meeting	Tempe
City of Scottsdale green building support group	Discuss year 2002 green building projects/conferences	Scottsdale
February 2002		
AZ Military Pollution Prevention Partnership	Discuss P2 implementation with military bases in Arizona-quarterly meeting	Davis-Monthan AFB
Arizona Association of Industries	Monthly meeting	Tempe
Environmental Professionals of Arizona	Board meeting	Tempe
EPA indoor air quality staff	Discussed efforts to promote environmentally better schools	Mesa
March 2002		
Governor's Environmental Pride	Conference planning	Scottsdale
AZ Environmental Leadership thru Mentoring	Planning meeting to set up a statewide environmental mentoring program for businesses	Phoenix
April 2002		
EPA Region 9 staff	Green business pilot program	Phoenix
AZ Military Pollution Prevention Partnership	Discuss P2 implementation with military bases in Arizona-quarterly meeting	Yuma Marine Corps Air Station

<i>Table 3: Pollution Prevention Promotion</i>		
Business/Agency	Purpose/Topic	Location
U of A agriculture department staff	Discussed sustainability indicators for watershed protection	Tucson
Automotive Association of AZ – Yuma chapter president	Discuss proposed formation of a green business program for automotive shops	Yuma
Rocky Mountain Fleet Managers' Association board president	Discuss proposed formation of a green business program for automotive shops	Flagstaff
May 2002		
Environmental Professionals of Arizona	Board meeting and monthly technical presentation meeting	Tempe
June 2002		
EPA Region 9 staff	Green business development conference call/discussion	Phoenix
Environmental Professionals of Arizona	Monthly meeting and environmental discussion	Tempe
AZ Environmental Leadership thru Mentoring	Environmental planning meeting	Phoenix
Governor's Environmental Pride	Environmental conference planning	Scottsdale

Outstanding Achievements

This category includes important achievements that the department is especially proud of and involves the use of P2 techniques. These achievements can be used to set an example for others and to teach others about P2.

New ADEQ Building Designed and Built Using Pollution Prevention Techniques

The Pollution Prevention Program staff were instrumental in putting forth the idea to have the state write specifications to design and construct both the new ADEQ building and the ADOA building to high environmental “green building” standards. These were the first Arizona state buildings constructed in this manner.

What makes a building green? A green building is a structure that is designed, built,

renovated, operated or reused in an ecological and resource-efficient manner. This is P2.

The newly occupied office building was designed and built using a rating system that includes a menu of several categories from which a builder may choose to demonstrate environmentally sensitive design. Such categories include site design, energy efficiency, water conservation, materials usage and indoor air quality.



The “green” features of ADEQ’s new building include:

Sustainable Sites

- Building is adjacent to several city bus lines
- Shower facilities for occupants who bike or walk to work
- Alternative-fuel fueling stations in parking garage
- Storm water retention ponds for runoff
- Energy Star-rated roof system
- Outdoor light layout modified so there is no light beyond property line

Water Efficiency

- High efficiency irrigation and a gray water system

Energy and Atmosphere

- DOE II energy study completed
- Dimmable ballasts
- Motion sensors to control all lights
- Variable frequency drives (VFDs) on all electric motors
- Energy Star transformers

Materials and Resources

- Recycling areas on each floor and loading dock
- Separate recycling receptacles for different waste streams
- Recycled construction materials, including:
 - Structural steel > 20 percent recycled content
 - Carpet > 65 percent recycled content
 - Ceiling tile > 85 percent recycled content
 - Glass, 20 percent recycled content
 - Locally manufactured materials used

Indoor Environmental Quality

- Prevent exposure to tobacco smoke
- Carbon dioxide monitoring system
- Mechanical design adjusted to have more air exchanges per hour
- Duct work openings covered during construction and flushed out for a minimum of two weeks prior to occupancy
- Used low VOC paint, carpet adhesives, mechanical adhesives and wood with no formaldehyde resins
- Placed all open areas near windows, all enclosed offices and rooms near the center away from glass

Innovation in Design

- Used Rockland Materials to supply concrete because their truck fleet uses bio-diesel fuel (vegetable oil)
- Installed a 55 KW solar system on parking canopies to create renewable energy from the sun and provide shade for 90 stalls

Pollution Prevention Partnership

The department formed a new partnership with Arizona's military posts to improve environmental communications and cooperation, share technical P2 successes between the posts and to reduce hazardous waste generation and toxic chemical use.



The formal signing ceremony in support of the Arizona Partnership Charter was conducted at Ft. Huachuca

during the Arizona Commanders Summit on March 6, 2002. Commanding officers flew in from their various locations to participate in the signing of the charter. ADEQ Deputy Director, Ric Tobin (back row, third from left) signed for ADEQ. Gary Gasperino (Department of Defense facilitator) presented the charter and each installation commander or his representative signed the charter acknowledging support for the partnership.

Arizona Pollution Prevention Practice Recognition

Arizona Clean & Beautiful, a nonprofit volunteer-driven organization, includes P2 practice recognition in their annual *Governor's Pride in Arizona Awards* program and

requests technical assistance from the Pollution Prevention Program. The Pollution Prevention Programs is also one of the event sponsors. The P2 piece recognizes individual outstanding P2 projects and is not based being in substantial regulatory compliance. Arizona Clean & Beautiful's program may include awards in the categories of P2, criminal justice, environmental leadership, water conservation, community achievement, environmental education, recycling, environmental technology, transportation enhancement and distinguished community leadership. The department is working to make the P2 recognition application process better. The Nov. 16, 2001 recognitions were presented by Arizona Secretary of State Betsy Bayless. A brief description of the P2 award winner provides an idea of the importance of P2 in these businesses.

The department also participates in the Arizona Military Partnership for Pollution Prevention. Two members of this partnership, the Raytheon Company (pollution prevention) and Davis-Monthan AFB (recycling), received recognition.

Pollution Prevention Award Winner: Raytheon Company

Cleaning and degreasing components during the manufacturing process is a constant need in the electronics industry. At Raytheon, where missile flight hardware is manufactured, reliability is critical. This plant is government owned by the Air Force and Raytheon operates the company. Together, the Air Force and Raytheon Company are committed to P2.

Previously, a solvent degreaser that released as much as 10 tons annually of volatile organic pollutants was used to degrease parts during the production process. This solvent had a high replacement cost, was inefficient and took up a lot of valuable workspace.

A proposal was accepted to change to an aqueous cleaner. This benefitted Raytheon and the environment by:

- Lowering maintenance costs
- Removing 10 tons of volatile organic emissions a year
- Increasing efficiency
- Eliminating the need to isolate component cleaning from the main manufacturing area

This Six Sigma process is one that draws on all disciplines, examines every alternative, formally measures trade-offs, allows no trial and error, and reaches conclusions in an orderly and structured way. In this case, it saved \$18,000 a year and improved the environment and manufacturing process.

Honorable Mention: Davis-Monthan Air Force Base (Recycling)

Davis-Monthan Air Force Base in Tucson has a population approaching 11,000 and occupies more than 10,000 acres of the Sonoran Desert. In this small city,

industrial, commercial and residential activities produce between 8,000 and 9,000 tons of solid waste a year.

The base goal is to recycle 40 percent of the solid waste stream by 2005. In the last 12 months, the base generated 8,636 tons of solid waste and recycled 3,394 tons of it for a waste diversion rate of about 39 percent. The base has virtually achieved its recycling goal nearly four years ahead of schedule.

Waste Minimization Goal

The department established a numeric goal for the state for hazardous waste minimization. The statewide hazardous waste minimization goal is to achieve a 25 percent reduction by the year 2000. The calculation lags by two years because of the need to obtain economic data. Calculation of the data requires obtaining an annual data update from the Bureau of Economic Analysis (BEA) Web site at www.bea.doc.gov. The BEA Web site changed in 2000 from using 1992 dollars to 1996 dollars, which revised how the calculation is done. The calculation also uses information from the department's hazardous waste "facility annual report." Figure 2 shows the trend in hazardous waste per gross state product.



Figure 2: Hazardous Waste per Gross State Product

Toxic Data Reports

The department receives annual copies of reports from each regulated facility required to complete a toxic chemical release inventory (TRI) form as part of EPA's Community Right-to-Know Program. The TRI forms are summarized by the EPA and published on the internet in a TRI public data release each year. Facilities filing the reports are generating and handling wastes, and/or creating environmental emissions. Reports are due each July 1 for the previous calendar year. The most recent reports are for reporting year 2000.

For reporting year 2000, EPA lowered the reporting thresholds for certain persistent bioaccumulative toxic (PBT) chemicals, added a category of dioxin and dioxin-like compounds to the list of toxic chemicals, established a 0.1 gram reporting threshold for the category, added certain other PBT chemicals to the list of toxic chemicals and established lower reporting thresholds for these chemicals.

Arizona facilities required to file TRI forms are also required to perform a P2 analysis and submit a P2 plan under Arizona's P2 policy and law.

The number of chemicals being reported on the TRI forms has been rising due to adding additional chemicals to the reporting list. The number of Arizona manufacturing and non-manufacturing facilities filing TRI reports are shown in Table 4.

<i>Table 4. Total TRI Facilities and TRI Reports Filed by Year</i>									
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
Forms Filed	638	624	569	545	589	599	820	822	840
Facilities	218	216	214	202	221	217	252	246	236

Transfers and Releases of Hazardous Waste from Arizona Facilities

Arizona continues to make strides in managing its own wastes related to those chemicals on EPA's toxic chemical release inventory (TRI) list. Great progress has been made, but as shown by the amount of hazardous waste still existing and expectation that it will increase with increased state growth, there is room for a great deal more effort. Arizona received 14,961,961 pounds of TRI hazardous waste from other states, a 27 percent increase from 1999. On the other hand, Arizona shipped 28,979,534 pounds (66 percent) of its TRI hazardous waste to other states, a 5 percent increase. About (84 percent) of this hazardous TRI waste was sent out or received for recycling or recovery. This is good news since recycling is an improved environmental management tool compared to disposal.

States that receive TRI hazardous waste from Arizona businesses are shown in Table 5. Arizona also receives TRI hazardous waste from other states as shown in Table 6. In Tables 5 through 8, ↓ means a decrease from 1999; ↑ means an increase. An entry that did not show up last year is shown as “new” for reporting year 2000.

<i>Table 5: States Receiving Arizona TRI Waste</i>			
	Pounds		Pounds
Arizona	14,831,700 ↓	Arkansas	81,697 ↓
Texas	10,113,820 ↑	Iowa	45,040 ↓
California	7,470,565 ↓	Pennsylvania	35,231 ↑
Illinois	2,177,357 ↑	Germany	27,203 ↑
Kansas	2,164,669 ↓	Oregon (new)	24,069 ↑
Missouri	1,441,084 ↓	Idaho	22,591 ↑
Nevada	969,167 ↑	Nebraska	20,312 ↓
Montana	815,294 ↓	Louisiana	12,613 ↑
Indiana	654,898 ↓	New York (new)	3,480 ↑
Canada	653,173 ↑	Washington (new)	3,140 ↑
Wisconsin	514,356 ↓	Florida (new)	2,227 ↑
Connecticut (new)	466,816 ↑	Colorado	917 ↑
Ohio	312,129 ↓	State Not Listed	907
Alabama	290,156 ↑	Massachusetts	751 ↓
Oklahoma	216,675 ↑	South Carolina	356 ↓
New Jersey	181,126 ↓	Tennessee	316 ↓
Virginia	144,256 ↓	Kentucky (new)	234 ↑
Utah	112,909 ↓	2000 Total ¹	43,811,234

¹ The 1999 total was 42,920,714 pounds

<i>Table 6: Other States Sending TRI Hazardous Wastes into Arizona</i>			
	Pounds		Pounds
California	3,865,960 ↑	Oklahoma (new)	28,997
Texas (new)	2,667,636	Nebraska	22,473 ↑
Arkansas	1,623,525 ↑	Wisconsin (new)	21,473
Tennessee (new)	1,461,957	Kansas	9,736 ↑
Illinois	906,356 ↑	Iowa	9,060 ↑
Alabama	906,356 ↑	Louisiana (new)	3,239
New Mexico	761,804 ↓	N. Carolina (new)	3,200
Nevada	550,265 ↓	Mississippi	1,436 ↑
Indiana	469,995 ↑	Massachusetts	1,275 ↓
Connecticut	431,759 ↑	Idaho	1,219 ↑

<i>Table 6: Other States Sending TRI Hazardous Wastes into Arizona</i>			
Montana (new)	176,900	New York	750↑
Utah (new)	110,135	Delaware	542↓
Ohio	98,321↓	S. Carolina (new)	250
Oregon (new)	66,944	New Jersey	7↓
Colorado	49,084↑	2000 Total	14,961,961↑

<i>Table 7: Total On-site Releases in Arizona Cities, Including New Sectors</i>			
	Pounds		Pounds
Kearney	155,109,469↑	Benson	85,305↓
Sahuarita	149,380,178↓	Douglas (new)	69,584
Claypool	120,809,259↓	San Manuel	66,260↓
Bagdad	94,904,904↓	Peach Springs (new)	56,591
Morenci	86,470,757↓	Tempe	48,327↓
Green Valley	59,245,640↓	Kingman	42,637↑
Hayden	35,487,476↓	Glendale	24,400↑
Marana	3,595,905↓	Tolleson	18,952↑
Page	2,941,539↑	Prescott	6,063↓
Springerville	2,038,019↑	Gilbert	6,063↓
St. Johns	1,987,210↑	Prescott Valley	6,063↓
Phoenix	1,25,440↑	Flagstaff	5,087
Bisbee	89,910↑	Queen Creek	4,866↑
Cochise	536,392↑	Goodyear	4,578↓
Snowflake	398,168↑	Yuma	3,825↓
Tucson	240,551↑	Clarkdale	681↑
Mesa	222,922↓	Dragoon	500
Chandler	207,615↑	Rio Rico (new)	250
Eloy	159,199↑	Nogales	160
Miami	109,125↓	Scottsdale	154↓
Casa Grande	89,434↑	Rillito	24
		Total for all cities	961,850,920↑

Table 8: Top 15 Arizona Chemicals (Excludes New Sectors and Smelters) – Released to Air On-site (Section 5)

	Pounds		Pounds
Styrene	805,525↑	Nitric Acid	70,559↑
Certain Gylcol Ethers	260,141↓	N-Butyl Alcohol	64,498↑
N-Hexane	159,396↓	Toluene	61,265↓
Methanol	148,624↑	Xylene (mixed isomers)	49,797↑
Methyl Ethyl Ketone	124,605↓	Dichloromethane	44,459↓
Ammonia	100,512↑	Chlorodifluoromethane	40,000↓
Hydrogen Fluoride	96,361↑	Sulfuric Acid	36,762↓
1,1-Dichloro-1-Fluoroethane	95,029↑	Top 15 Air Subtotal	2,157,533

On-site Air Releases

Figure 3 shows the trend in releases of the TRI chemicals for Arizona facilities excluding new sectors added to TRI in 1998 and excluding smelters. About 39 facilities reported for the first time in 1998 (new facilities) due to EPA reporting revisions which added new business sectors. This resulted in an overall increase of releases for all facilities beginning in 1998. This air emission increase was due mostly to new reporting by six electrical generating facilities. The top facilities generating air releases are the Coronado Generating Station in St. Johns, the Navajo Generating Station in Page and the Cholla Power Plant in Joseph City. These facilities which reported for the first time in 1998 have been excluded from Figure 3 because they would cause a sudden step in the data for 1998 thereafter and obscure any long term trends.

Figure 3 shows that the reporting year 2000 Arizona TRI air releases consistent with those of 1999. There was a downward trend since 1991 that has begun to level off in 1999 and 2000. Looking closer, without rounding off, there is a slight increase from 1999 to 2000 (from 2.379 to 2.425 million pounds) which appears to be due to small increases over many facilities. As an example, the largest year 2000 increase occurred at Sea Ray Boats in Phoenix which had air emission increases from 272,900 to 302,000 pounds (due to increased styrene and methyl methacrylate releases). The new facilities excluded from this data were discussed in the previous paragraph and are facilities in the industry codes that were first required to report in and after 1998. The facilities under the category of “excluding new facilities and smelters” are those reporting facilities typically found in Arizona’s metropolitan areas and are part of ADEQ’s Pollution Prevention Program and are the typical manufacturing facilities in standard industrial codes (SIC) 20-39.

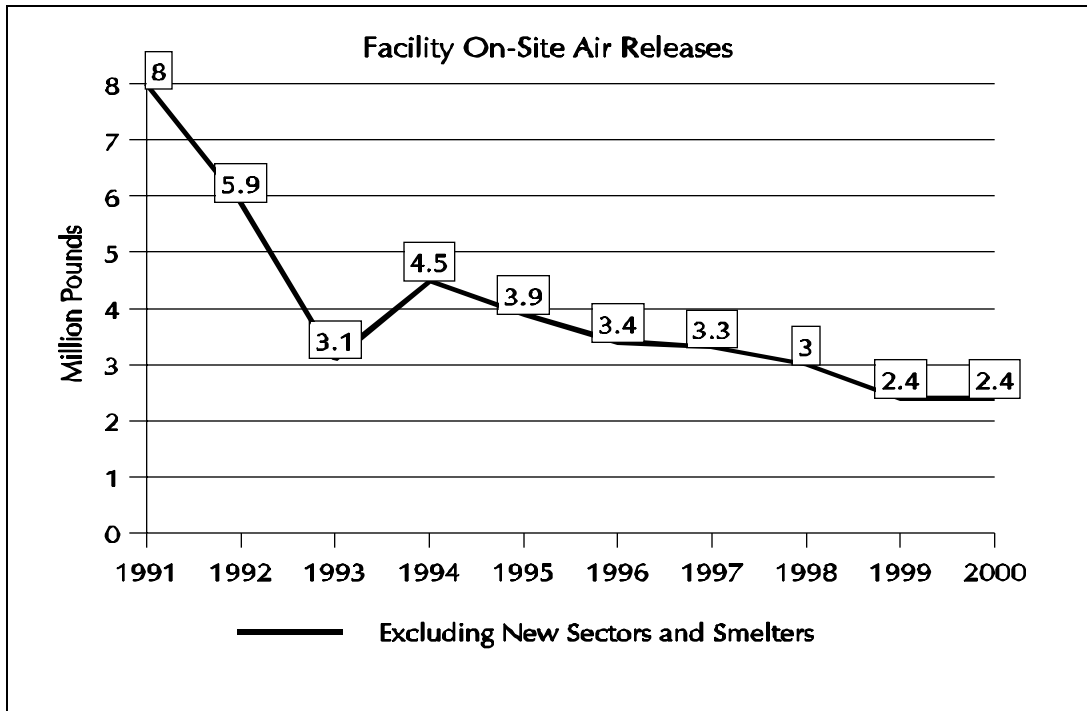


Figure 3: Core Facility On-site Air Releases 1991-2000

Facilities Reporting and Filing Pollution Prevention Plans

As of June 30, 2002, ADEQ had received 393 P2 plans. Deficient plans are returned for revision. Table 9 shows the number of plans, amendments and progress reports received and the number of approval certificates issued. Facility names for the new plans received during this reporting period are listed in Table 10.

Table 9: Pollution Prevention Plans

	07/01/01 to 06/30-02
Plans Received	10
New Certificates Issued	10
Amendments Received	44
Progress Reports	130

Table 10. Plans submitted between July 1, 2001 and June 30, 2002

McCarthy Cabinet – Phoenix	Automation Plating Corp. – Tucson
General Dynamics – Scottsdale	Proclean of AZ – Phoenix
AZ Electric Cooperative – Cochise	Inter- Fab , Inc. – Tucson
Southwest Fiberglass –Tucson	Koch Asphalt SW – Glendale
Fiber Fab – Gilbert	Poly Print, Inc. – Tucson

Synopsis of Annual Progress

The department publishes annual addendums to our document titled “Summary of Arizona Pollution Prevention Plans: Goals, Methods and Target Chemicals.” This addendum is a compilation of the annual progress report goals and reduction methods received in the year.

The department collects data derived from P2 plans and annual progress reports submitted by facilities. Each plan covers a time frame, typically a two-year period, to complete specified P2 goals. After the two years, additional goals are proposed in plan amendments. The latest data has been summarized only through the year 2000. Table 11 shows quantity reductions of wastes, materials and resources from 1991 through 2000.

Table 11: Reduction of Wastes, Materials and Resources, Ranked by Quantity Reduced

No.	Waste, Material, Resources	Baseline Quantity (1991)	Quantity Reduced	Reduction from Total
1	Wastewater	6,230,722,699 lbs	2,030,951,791 lbs	69.1462 %
2	Water	3,328,813,976 lbs	690,924,296 lbs	23.5233 %
3	Hazardous Materials and Wastes	133,335,043 lbs	103,455,270 lbs	3.5222 %
4	Corrosive Materials and Wastes	333,727,216 lbs	58,009,384 lbs	1.9750 %
5	Solid Materials and Wastes	96,731,092 lbs	27,044,292 lbs	0.9207 %
6	Ignitable Materials and Wastes	37,069,559 lbs	17,171,106 lbs	0.5846 %
7	Toxic Materials and Wastes	20,229,102 lbs	6,961,208 lbs	0.2370 %
8	Oils and Used Oils	3,163,842 lbs	2,302,818 lbs	0.0784 %
9	Reactive Materials and Wastes	474,883 lbs	187,343 lbs	0.0063 %
10	PCB	179,564 lbs	133,633 lbs	0.0045 %
11	Antifreeze	58,651 lbs	40,829 lbs	0.0013 %
	Total	10,184,505,627 lbs	2,937,181,959 lbs	100.000 %
	Note: Energy	37,418,538 kwh	3,092,122 kwh	

Table 11 shows that during 1991 through 2000, a total of 2.93 billion of pounds of wastes and resources have been reduced by the 217 facilities. The reduction in water usage was 690 million pounds which represents 24 percent of the total reduction, and the reduction in wastewater was 2.03 billion pounds which represents 69 percent of the total. The remaining 7 percent (or 215 million pounds) represents the quantity of wastes and materials reduced.

Table 12 shows that the utilization of 3.1 million kwh of electricity has been prevented. The rate of energy use reduction is 8.3 percent (baseline quantity of 37 million kwh).

Among various categories of wastes and materials, unspecified hazardous materials and wastes (Item 1 in Table 12) represents the group with the highest reduction rate, i.e., 77.59 percent. This is shown in Table 12. Hazardous materials and wastes (unspecified) include, for example, laboratory packs or mixtures of chemicals with different hazard characteristics (i.e., ignitability, reactivity, corrosivity, toxicity).

The next categories ranked high in the table are PCBs (74.41 percent), oils and used oil (72.78 percent), and antifreeze (69.61 percent). The group of ignitable materials and wastes achieves 46.32 percent reduction rate, followed by reactives (39.45 percent), toxics (34.41 percent), wastewater (32.59 percent), solid waste (27.95 percent) and corrosives (17.38 percent).

<i>Table 12: Reduction of Wastes, Materials and Resources, Ranked by Percent of Reduction From the Baseline</i>				
No.	Waste, Material, Resources	Baseline Quantity (1991)	Quantity Reduced	Reduction from Total
1	Hazardous materials and wastes	133,335,043 lbs	103,455,270 lbs	77.5904
2	PCB	179,564 lbs	133,622 lbs	74.4146
3	Oils and used oils	3,163,842 lbs	2,302,818 lbs	72.7854
4	Antifreeze	58,651 lbs	40,829 lbs	69.6134
5	Ignitable materials and wastes	37,069,559 lbs	17,171,106 lbs	46.3213
6	Reactive materials and wastes	474,883 lbs	187,343 lbs	39.4503
7	Toxic materials and wastes	20,229,102 lbs	6,961,208 lbs	34.4118
8	Wastewater	6,230,722,699 lbs	2,030,951,791 lbs	32.5957

Table 12: Reduction of Wastes, Materials and Resources, Ranked by Percent of Reduction From the Baseline

No.	Waste, Material, Resources	Baseline Quantity (1991)	Quantity Reduced	Reduction from Total
9	Solid materials and wastes	96,731,092 lbs	27,044,292 lbs	27.9582
10	Water	3,328,813,976 lbs	690,924,296 lbs	20.7558
11	Corrosive materials and wastes	333,727,216 lbs	58,009,384 lbs	17.3822
12	Energy	37,418,538 kwh	3,092,122 kwh	8.2636

Facilities with Inadequate Plans or Reports

Toxic data reports (TDRs) are due on July 1 of each year. A toxic data report includes the P2 plan amendment and the annual progress report which are due on July 1, 2001. A plan amendment is required when the time frame of the plan expires. These reports are inadequate when not submitted by the required date.

The following lists those facilities that submitted their toxic data reports at least 90 days late or have not submitted any reports.

Table 13: TDR Reports Submitted at Least 90 Days Late

AACCo Cast products	Phoenix Brick Yard
ATLAS Roofing	Phoenix Cement Co.
Aviation Mgmt. Systems	Praxair, Inc.
AVONTI Manufacturing	Prochem
Balden Communications	Service Wire Co.
Distinctive Marble	Univar USA, Inc.
MGC Pure Chemicals	W.R. Grace & Co.

Table 14: TDR Reports Not Submitted

Advanced Construction Products, Inc.	Opto Power Corp.
Air Tuf Products, Inc.	Owens Corning
Corella Electric Wire and Cable	Patrician Marble Co. , LLP
Cuttler-Hammer	Palm Harbor Homes-Tempe
Gem Microelectronic Materials	Precision Marble. Inc.
Great Western International	Redman Homes
Kysor panel Systems	United Dairymen of Arizona
Metco Metal Finishing-Phoenix	

Recommendations for Form R Filers That Do Not Generate Hazardous Waste

The following typical Arizona facilities file a TRI form but do not file a hazardous waste generator report:

AACCO Cast Products	Casa Grande Enterprise	Maxx Spas, Inc.
Advanced Construction Products	Creamette Co.	Mesa Fully Formed
Air Products/Chemicals	Desert Sun Fiberglass	Monsey Products Co.
Allied Precious Metals	Distinctive Marble	Patterson Laboratories
Allied Tool and Die	DQC Manufacturing	PAX Company
American Fiberglass	Earl's Fiberglass, Inc.	Patrician Marble
American National Can	Fiber Fab. Inc.	Royal Sterilization
Arizona Castings, Inc.	GreenStone Industries	Sunland Beef Company
Arizona Marble	Ironite Products Co.	Thermal Engineering
Badger Meter, Inc.	Insulated Shipping	Ultra Installations
Baja Products, Ltd.	L and M Laminates and Marble	Valley Marble
Borden Pasta Group	Marlam Industries, Inc.	

P2 has a multimedia technical focus (air, water and land impacts), so even when there may be no hazardous waste reduction opportunities, there may be reduction opportunities in air emissions, prevention of leaks and spills, or wastewater.

A few of these facilities requested a P2 plan exemption because they do not generate hazardous waste and therefore believe they have nothing to reduce, for example, ammonia used in closed loop chillers (such as dairy and meat processors), machining chromium-laden stainless steel, extruding copper rods into wire, and using styrene in cultured marble manufacturing.

Only a P2 opportunity analysis, as required by the statute, can determine whether opportunities exist. Facilities that are unable currently to reduce toxic chemical use are still certified in the program once they do an analysis, even if no opportunities exist. These facilities are provided "no opportunities" status with the realization that this status may change with new technology or when new processes are added.

Several facilities that completed analyses found P2 opportunities when none were thought to exist. Some previous no opportunity facilities have later found reduction opportunities. The department believes that requiring these facilities to do the analysis, rather than giving an exemption, is fair treatment and is in the best interest of the public health and the environment. The department recommends no change in the requirements.

Statutory and Regulatory Recommendations

P2 implementation has shown opportunities for achieving significant reductions in toxic chemical use, hazardous waste generation, wastewater, process water and energy conservation while reaping significant financial rewards to businesses. Budget cuts over the last several years resulting in staff reduction and budget reductions have continues to impede P2 work. The department has recognized that the lack of knowledge of technical P2 information continues to be an impediment to accelerating P2 at many smaller companies. As a result, technical assistance to industry to identify P2 opportunities has been significantly greatly reduced due to these staff and budget limits. In years past, regulatory assistance efforts and the Arizona statute requiring P2 planning and reporting has helped to advance the implementation of P2 in industry.

Concurrently, there continues to be a dominance of technology-based, end-of-pipe regulations that continue to drive business decisions toward single-medium, pollution control compliance.

Future challenges still exist to help facilities structure multimedia and regulatory reinvention efforts that have P2 as their fundamental design component. Also, challenges exist to expand our P2 assistance program to help new filers to submit P2 plans that can be approved the first time.