

25 Years Protecting Arizona's Environment

1987 - 2012

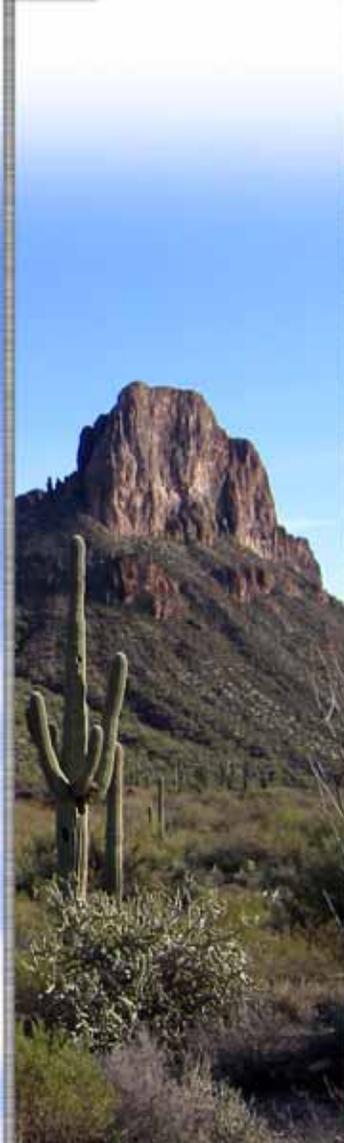


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STATE OF ARIZONA

JANICE K. BREWER
GOVERNOR

EXECUTIVE OFFICE

July 2, 2012

As Governor, it is an honor and a privilege to acknowledge the Arizona Department of Environmental Quality (ADEQ) on this significant occasion. As you know, July marks the 25th anniversary of ADEQ's establishment as a separate agency within the State's executive branch. I felt it only appropriate to recognize the outstanding contributions ADEQ employees have made over the past 25 years.

We are truly blessed to live in a State so renowned for its rich and unique heritage, stunning desert vistas and lush pine forests. When it comes to natural beauty, Arizona is simply unparalleled. Still, we know from experience that life in the desert can be challenging, resources pushed to their limits.

For two and a half decades, the men and women of ADEQ have dedicated themselves to the noble cause of environmental stewardship. They have helped us respect the delicate balance between the natural world and the people who depend on it for sustenance, prosperity and a rewarding quality of life. Most importantly, they have served diligently and passionately to conserve and protect Arizona's natural bounty for generations to come.

This month, let us be thankful for ADEQ's efforts in preserving our State's most vital resources. Please join me in congratulating the Department on 25 remarkable years of dedicated service to the citizens of Arizona.

Sincerely,

A handwritten signature in black ink that reads "Janice K. Brewer".

Janice K. Brewer
Governor

Our History



Above: Environmental Quality Act establishing ADEQ was passed by the legislature and signed by Governor Bruce Babbitt on Aug. 13, 1986.

Below: Early ADEQ offices at 3033 N. Central Ave.



When House Majority Leader Rep. Burton Barr addressed the House Committee on Natural Resources and Energy in the spring of 1986, his words were powerful and direct about the matter at hand, the environmental quality act.

“In the history of state legislation,” Barr intoned. “This bill will be regarded as a landmark.”

And so it was.

The Arizona Department of Environmental Quality was established as a separate, cabinet-level agency in 1987 to administer all of the state’s environmental protection programs. The same legislation also established a comprehensive groundwater protection program and the state’s Water Quality Assurance Revolving Fund (WQARF), which cleans up contaminated sites that have the potential to harm human health or groundwater.

Before ADEQ was created, the state’s environmental programs were managed by a number of different offices within the Arizona Department of Health Services.

During the last 25 years, ADEQ has grown in size from about 135 employees to an agency of more than 450 people, who support a wide range of environmental programs that protect the quality of our air, water and land in Arizona. The agency has created the rules and regulations necessary to administer state

environmental protection laws and a number of programs delegated by the federal government like the Clean Air Act, Safe Water Drinking Act, National Pollutant Discharge Elimination System program and the Resource Conservation and Recovery Act program.



1987

Aquifer Protection Permit (APP) Program for groundwater protection is established.

Our Green Building

ADEQ Moved into One of the Nation's Greenest Buildings on Washington Street a Decade Ago

The Arizona Department of Environmental Quality has practiced what it preached in its own work environment. The agency's six-story headquarters, located at 1110 W. Washington in Phoenix, has been a regular winner of state and regional awards for its green features, including greenest building in state government, since its completion in July 2002.

When Opus West finished the building's construction, it was the largest green building in Arizona. In fact, according to Mark Stromgren, senior property manager for what is now Lincoln Properties Company, the building was the largest LEED Silver building in the country at the time it was built.

LEED, or Leadership in Energy and Environmental Design, is a framework and rating system designed by the U.S. Green Building Council to promote green building practices. It consists of four levels of certification: certified, silver, gold and platinum.

ADEQ's building, which wraps around the historic Evans House, has many energy-saving features that reduce energy consumption more than 20 percent below conventional buildings and save the state about \$60,000 a year in energy costs.

These features include a white roof that reflects summer sun rays, motors with variable frequency drives that run at less than full capacity unless there is peak demand, glass that utilizes light but reflects heat away from walls and furniture, and Energy Star transformers. Other energy savings come from fluorescent lights that dim when natural light is available.

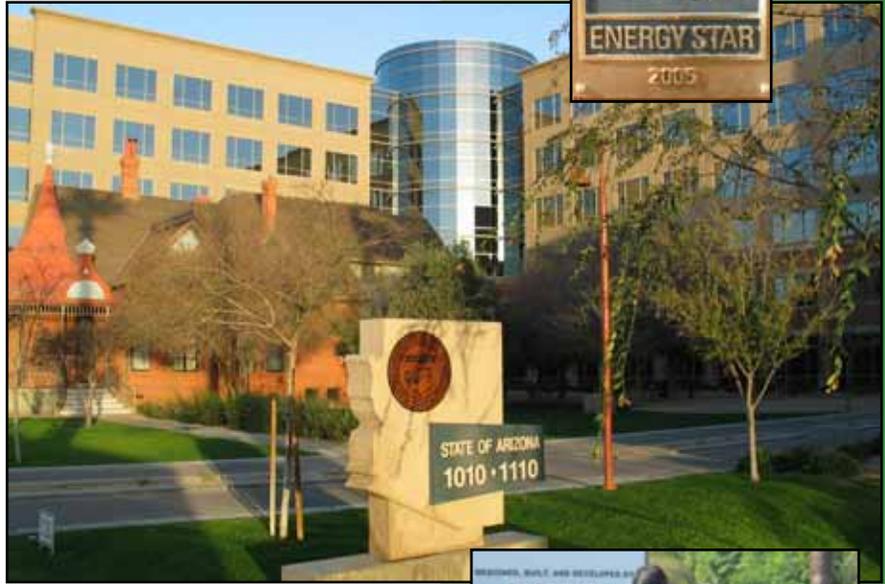
Motion sensors in the bathrooms control the amount of water used in the sinks and toilets and motion sensors in the offices and hallways automatically turn off lights when the area is unoccupied.

In the years after ADEQ moved into the building, a governor's office directive to reduce electric bulbs resulted in an additional energy saving of more than two percent without sacrificing workplace light.

Outside the building, trees and shrubbery are watered by a unique irrigation system which uses no potable water, only the bleed water from the air conditioning. Atop ADEQ's parking garage, Arizona Public Service placed 900 solar panels, which generate 200 kilowatts of electricity a year.

While the 300,000-square-foot building incorporated many green concepts, Stromgren said it only cost about one percent more to build than conventional construction because 87 percent of the building debris was recycled, including more than 2,400 tons of wood, gypsum board, steel, cardboard, concrete and masonry.

Bob Rocha, director of Administrative Services Division at ADEQ, and former General Services Manager John Joyce worked with Opus and the Arizona Department of Administration during the construction of the building. "For a state facility this is a premier building," Rocha said. "It was the first environmentally friendly building on the capitol mall."



Above: Governor Jane Hull, J. Elliot Hibbs the Director of ADOA and ADEQ Director Jacqueline Schafer break ground on the new building.

Below: The ADEQ budget team looks over the plans.



1988

First Environmental Ombudsman position in the nation established.

Cleaning Valley Air



Carbon Monoxide, Dust, Ozone Levels Fallen Far in 25 years

In the 25 years that the Arizona Department of Environmental Quality has been an agency, it has played a critical role in the dramatic improvement of air quality in the Phoenix metropolitan area.

Since 1987, the amount of carbon monoxide, dust and ozone in Valley skies has been reduced by 83 percent, 40 percent and 6 percent, respectively.

Even more remarkable is that this has been accomplished despite the population of the Valley increasing 94 percent from 1.98 million to 3.84 million during that period, the number of vehicles on Valley highways increasing 177 percent from 1.36 million to 3.76 million and the number of vehicle miles travelled within Maricopa County increasing 89 percent from an estimated 17.3 billion to 32.7 billion per year between 1990 and 2010.

ADEQ has assisted in cleaning up the Valley skies in a number of ways:

- Administering what is widely regarded as one of the nation's best vehicle emissions inspection programs.
- Partnering with Maricopa County Air Quality Department and Maricopa Association of Governments to develop and implement pollution reduction strategies.
- Providing technical expertise to task forces in 1996, 1998, 2001, 2007 and 2011 resulting in air quality acts that were instrumental in achieving improvements in air quality, including the elimination of dust problems during stagnant meteorological conditions.
- Issuing daily air quality forecasts and working successfully with local governments and the public, and representatives of dust generating operations to reduce dust levels.
- Operating a camera-based, Web-linked urban visibility monitoring program in Phoenix to observe and rate how air pollution obscures the views of Camelback Mountain, the Superstitions, South Mountain, the Estrellas and White Tanks.
- Using its own scientific expertise and partnerships with Arizona State University, Harvard University, the National Oceanic and Atmospheric Administration, the National Weather Service and Desert Research Institute to further understand the chemistry that produces high ozone levels.



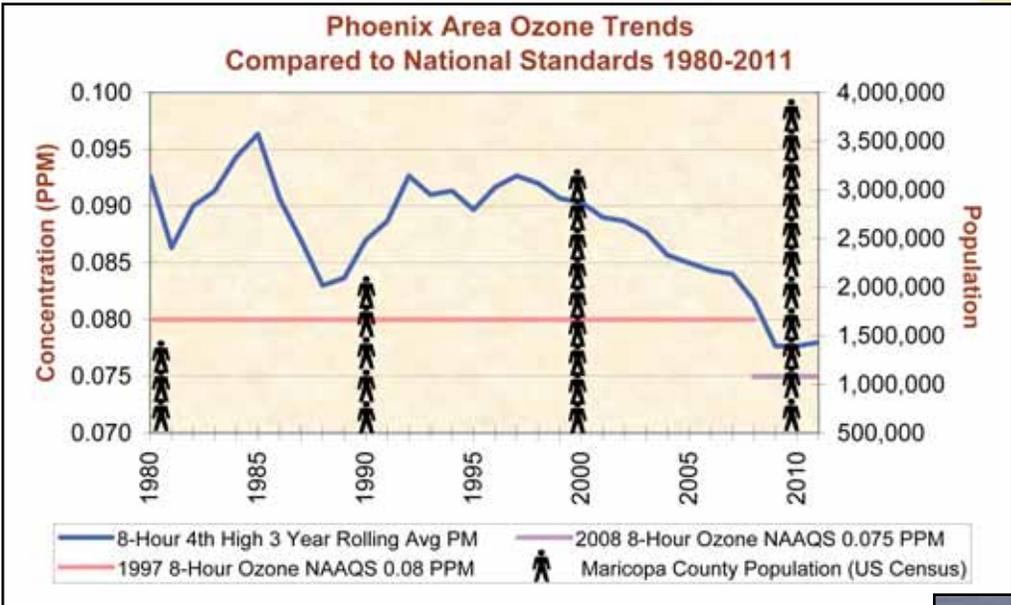
"The ADEQ staff has done excellent work over the years in improving air quality.

While federal requirements for new vehicle technologies have been critical, the vehicle emissions inspection program also did help get clunkers to clean up their act, letting motorists know that they may not have checked their vehicles' mileage in a while and that their cars may not be up to snuff. We requested a voluntary program by ADEQ to 'save the peaks' and issue advisories, which evolved into the on-going Phoenix Visibility Monitoring Network. Citizens told us that they prized their mountain views and tourism representatives expressed concern that continuing worsening of the areas visibility would have a negative effect on the number of visitors."

- Ed Phillips
Former State Senator and a long-time Valley television and radio meteorologist

1989

Oxygenated fuels program was implemented on October 1, 1989. These fuels burn more cleanly, and produce less carbon monoxide.



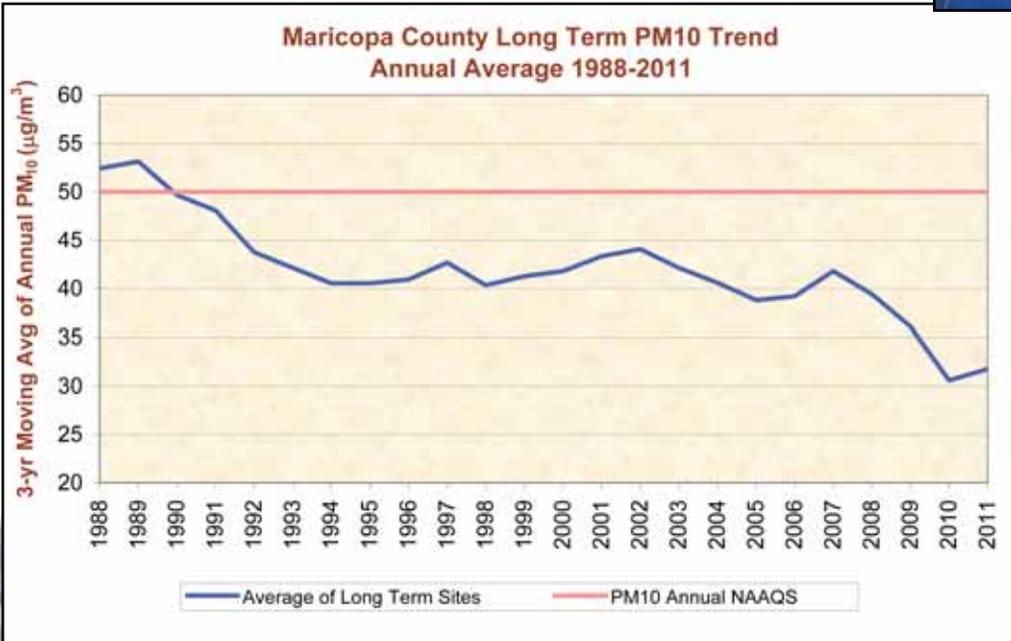
The Phoenix area's topography and climate play a significant role in concentrations of air pollution.

Every evening after sunset, the land cools off more rapidly than the air above it, trapping dust and gases from combustion under the inversion and combining with moisture to form a brown cloud.

Due to elevation differences, cooler air pushes pollution across the Valley from east to west. Each morning, as the sun rises and the land and air heat up, the air flow direction reverses leading to higher afternoon pollutant levels in the East Valley.

The Valley's weather also produces unique challenges. With an average wind speed of only 6 mph, the Valley is prone to having stagnant air which traps pollutants, sometimes for days at a time.

Also, monsoon storms in the summer push enormous dust storms into the area, sometimes from hundreds of miles away. Westerly winds transport ozone and other pollutants from out of state. The abundance of summer heat and sunshine combine in the chemical formation of ground-level ozone.



1990

Completion of the Non-point Source Water Quality Management Program allowed ADEQ to receive \$1.1 million in Federal Clean Water Act grants.

Forecasting

In late June 2011, ADEQ's meteorological forecast and analysis team had one of those "can you believe we called that right" moments.

A fine-particle soot lingered in metropolitan Phoenix's air. People figured it was caused by smoke from a wildfire in southeastern Arizona, but ADEQ's meteorologists knew that wasn't the case. Prevailing winds were blowing the wildfire's smoke toward New Mexico.



Using their detailed satellite imagery and weather charts, the forecasters came up with a novel conclusion.

Huge Canadian wildfires north of Edmonton, Alberta - and very far from Arizona - had charred nearly 400,000 acres of forest. ADEQ's forecasting team determined the Alberta smoke had migrated first into neighboring British Columbia and down a corridor through Washington, Oregon and California to just east of Los Angeles. It then doglegged into western Arizona before settling over the Valley.

Local news media were incredulous, at least until a dozen or so reporters came to ADEQ's Phoenix offices and reviewed the forecasting team's high resolution maps and charts for themselves.

Then, they believed.



ADEQ Forecasters Have High Accuracy Rate in Tough Job

It's a tough job for our favorite forecasters on TV or radio to come up with accurate information about today's weather and the five-day outlook.

But imagine the difficulty of having to do the same kind of forecasting for levels of a myriad of different air pollutants where concentrations are measured not in degrees Fahrenheit, but in concentrations such as parts per billion.

That's where Arizona Department of Environmental Quality forecasting comes into play. Since the winter of 1989, Valley residents have depended on the agency to forecast local air pollution levels. And they have received a lot of accurate information over time. In 2011, ADEQ forecasters accurately predicted a health watch or high pollution advisory for ozone 70 percent of the time before they occurred.

"The synopsis and discussion part of the daily weather forecast produced by ADEQ is quite good and detailed and something I use regularly. Data is great but professionals putting the information into context is even better," said Royal Norman, long-time meteorologist for KTVK Channel 3 in Phoenix. "The real-time air quality map on the ADEQ website is also a valuable tool to help locate areas of metro Phoenix where air quality is degraded."

The number of those receiving forecasts has grown from a handful to nearly 6,000 subscribers and those connected to ADEQ through social networks. Daily forecasts are provided for ozone, Particulate Matter-10, PM-2.5 and carbon monoxide in the metro Phoenix area; ozone, PM-10 and PM-2.5 in the Yuma area; and the risk of wind-blown dust in Green Valley. A daily forecast for PM-10 and 2.5 is planned for Nogales in the fall of 2012.

In 1989, the agency started forecasting levels of carbon monoxide, which primarily comes from vehicle exhaust. That proved to be relatively easy because high levels occurred only on winter days with stagnant air. Predictions of high levels of carbon monoxide triggered "no-burn"



Above: The historic 2011 haboob.

Right: The launch of the first weather blimp in 1992.



days and admonitions to car-pool or ride the bus. Because of many control measures, unhealthful levels of the pollutant have not occurred in the Valley since 1999.

Forecasting the level of air pollution requires an understanding of the local

atmosphere from the surface to about 10,000 feet above it. In the late 1980s, the National Weather Service only collected this information in Tucson and Flagstaff. To get information in Phoenix, ADEQ began to release a tethered helium-filled weather balloon that ascended to nearly 8,000 feet and lofted a device to measure pressure, temperature, relative humidity, wind speed and direction and a transmitter to send the data. The data was used to predict conditions that could lead to high pollution levels.

From that basic beginning, ADEQ forecasting has advanced to use of an instrument package carried on commercial aircraft taking off and landing at Sky Harbor International Airport that measures atmospheric conditions. That data is overlaid graphically to increase resolution and details changing atmospheric conditions that affect weather and pollutant concentrations.

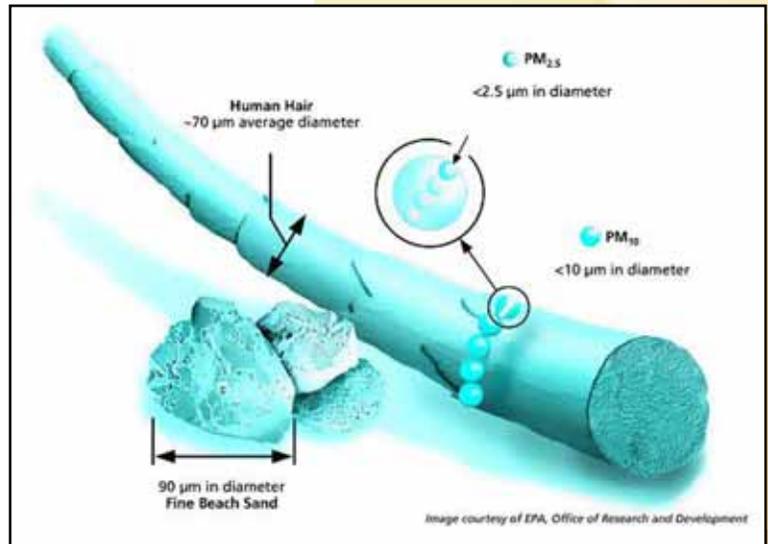
Understanding the atmosphere is one aspect of forecasting, but for ADEQ forecasters the other component is having accurate information on current air pollutant concentrations.

The ADEQ air quality monitoring network has expanded from 116 instruments at 51 statewide locations in 1987 to the current network of 234 instruments at 123 sites, including monitors operated by Maricopa, Pinal and Pima counties.

Measurements in grams per cubic meter have been replaced with trace-level instruments that measure in the parts per billion. Data collection systems that collected one measurement every six days have been replaced with instruments that measure every minute and report data averaged to the hour. Data records have transitioned from strip charts and magnetic tapes to a sophisticated Oracle database.

Over the years, ADEQ forecasters have honed their skills to increase the accuracy of their predictions.

That has led to great strides in forecasting one of the most complex pollutants, ozone, a combination of nitrogen oxides and volatile organic compounds which react in the presence of heat and sunlight. Forecasting ozone levels presents the most challenges because typically the pollutant forms and travels with prevailing winds from west to east across the Valley, where the highest concentrations usually occur in the afternoons.



Office of Border Environmental Protection



Top: Diesel retrofits help reduce emissions and clean Nogales air.

Right: The revitalized Santa Cruz River.



ADEQ Solves Environmental Problems in Border Region

Five years ago, the Santa Cruz River was so contaminated that native fish species were dying off and the leaves of the river's stately cottonwoods were turning a sickly brown.

Something had to be done.

Staff at the Arizona Department of Environmental Quality studied the problem and determined the contaminants resulted from discharges of raw sewage and storm water originating in Mexico, which then flowed north into Arizona. To avoid a potential public health and safety disaster at the border between the United States and Mexico, ADEQ worked to maintain \$65 million of mostly federal funding to revamp the Nogales International Wastewater Treatment plant and provided the technical expertise to improve the vitality of the river.

Below: Two shots of the new state-of-the-art Nogales International wastewater treatment plant.



ADEQ staff developed ideas for using the federal money on the project and figured out how best to remove pollutants like ammonia that were adversely affecting the life of one of southern Arizona's premier riparian areas. They collaborated with conservation groups to monitor the health of the river on a continuing basis and convinced their Mexican counterparts to support their efforts in protecting the quality of water discharges that cross the international boundary.

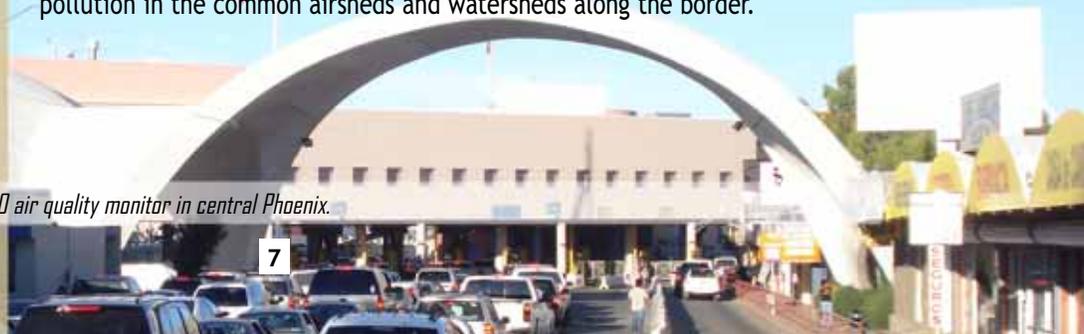


Restoration and revitalization of the Santa Cruz River is just one example of how ADEQ has helped protect human health and the environment of Arizona communities in the border region. While the international boundary legally separates the two countries, no such demarcation exists in terms of the

environment. Thus, Arizona residents benefit greatly from ADEQ efforts to control pollution in the common airsheds and watersheds along the border.

1993

The first continuous PM 10 air quality monitor in central Phoenix.





The international border near Douglas, Arizona.

Below: One of the many clean-ups along the border, part of the Arizona Border Trash Program.

ADEQ has long been an active participant on the international front through its role on the Arizona-Mexico Commission and Border Governors Conference and has helped find solutions for environmental problems on both sides of the border. Over the years, ADEQ has allocated tens of millions of dollars for drinking water and wastewater infrastructure benefitting Arizona border communities from Douglas, Sierra Vista, Willcox and Pomerene in southeastern Arizona to Yuma, San Luis, and Somerton in the southwestern part of the state.

ADEQ responded to the region's air quality problems by overseeing the installation of nearly 200 diesel emissions reduction devices on school buses in Yuma, Santa Cruz, Cochise and Pima counties and cargo trucks which regularly cross the border delivering produce between Nogales, Sonora, and the Rio Rico warehouses.

ADEQ staff has assisted its Mexican colleagues on several other projects such as identifying well-traveled dirt roads in Nogales, Sonora, for paving, which has reduced dust generation and improved air quality in the community that straddles the border. They have worked with Mexican officials to collect and properly dispose of waste tires and organized electronic waste recycling events.

Staff has even devised some fairly ingenious conservation approaches such as combining waste paper with sand and cement to make energy efficient building blocks and installing composting toilets in areas not served by wastewater infrastructure.

Some years ago, a number of agency employees organized and carried out trash cleanups on the patchwork of trails along the 370-mile border between Arizona and Mexico through a pilot project. These efforts eventually led to the establishment of the Arizona Border Trash program in 2008, which now features a Web page and database to offer consistent reporting and support for organizations conducting cleanups.

On the education side, ADEQ designs, prints and distributes thousands of calendars annually that convey clean-air messages, the artwork for which is provided by students on both sides of the border.

"ADEQ has done outstanding work identifying and finding solutions for the wide array of problems in the region of the international boundary," said Nogales Mayor Arturo Garino. "We are especially grateful for the assistance and continued collaboration, especially in attempting to solve our community's wastewater challenges."



Underground Storage Tank Program



Leaking Tanks Cleaned Up After ADEQ got involved

In 2000, a Quartzsite resident first noticed the pungent odors in the clothes washed in her home.

She called ADEQ and investigators swung into action investigating the cause of the odors. They began by testing 20 private wells and confirmed that contamination came from a large leak in storage tanks



owned by the already-closed Ted's Truck Stop.

ADEQ provided an alternative water supply so residents wouldn't be exposed to contaminants in their well water. The agency also worked with the Town of Quartzsite to expedite construction of a safe water distribution system.

A total of 17 groundwater monitoring wells were installed by ADEQ. They collected about 240 soil and groundwater samples. The agency then constructed a water treatment system. The system began operation in December 2007 and has removed about 14,000 gallons of petroleum since.

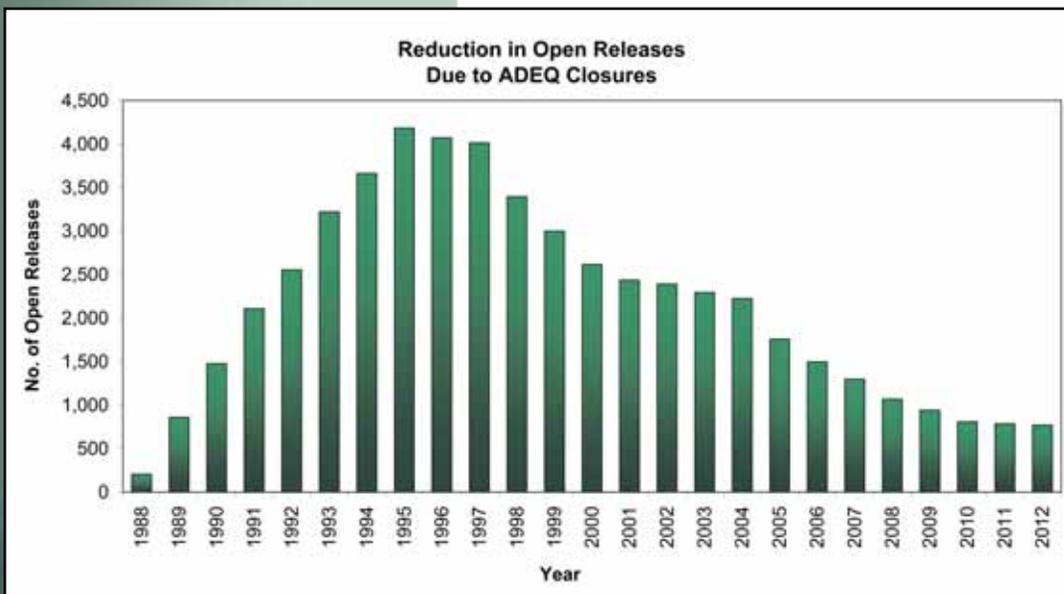
"ADEQ and its staff did an excellent job in identifying the source and coming up with a sustainable plan to clean up the soil and groundwater," said former Quartzsite Mayor Verlyn Michel.

This is just one of hundreds of ADEQ's success stories of cleaning up contamination caused by leaking underground storage tanks (LUST). That effort has been funded in part by the State Assurance Fund (SAF), a one cent per gallon excise tax on motor fuel which was established in 1990 to help the department and underground storage tank (UST) owners and operators offset the high cost of cleanups.

The ADEQ LUST Program was established in 1986 to provide a regulatory framework and process for ensuring that potentially hazardous releases from USTs are identified and cleaned up. Since inception, ADEQ has worked closely with UST owners and operators to

investigate and clean up their sites. ADEQ also works with property owners and conducts investigations and cleanup of releases for which no responsible party has been identified.

Since 1982, a total of 8,647 UST releases have been reported and 91 percent of those have been cleaned up and closed.





The current number of open releases has been reduced to 769. In addition to protecting the public health and environment of Arizona, the cleanup of the petroleum contaminated properties allows them to be redeveloped for productive use and increased state and local tax dollars.

One of the most notable success stories of the cleanup effort has been the Route 66 Initiative. Beginning in 2004, the initiative, along the path of America's once premier cross-country corridor, became a national program supported by the U.S. Environmental Protection Agency. Initially, about 100 properties were identified as having LUST contamination. By 2012, more than half of those properties had been cleaned up.

"ADEQ has done an excellent job of cleaning up contaminated properties along Route 66. The EPA is proud to join ADEQ to take the project even further. We want to explore ways to help support restoration and job creation along this historic route," said Jeff Scott, director of waste management at EPA's regional office in San Francisco.

The State Legislature established ADEQ's Municipal Tank Closure Program in 2001. That program removed abandoned USTs located in rural communities. ADEQ both managed and funded the tank removal activities and the program has removed 255 abandoned USTs in 43 cities across the state.

EPA awarded ADEQ \$3.2 million through the American Reinvestment and Recovery Act of 2009. ADEQ used this funding for investigation and cleanup of 26 facilities with contamination from LUSTs in 20 different cities.

Because of the economic downturn and the deadline passing for claim submittal under the SAF reimbursement program, ADEQ has had an increase in property owners and financially needy UST owners and operators turning to the LUST program to help them with their cleanups. By continually focusing on process improvement and enhanced communication with property owners and owners and operators of USTs, the program has evolved into one of the most successful cleanup programs in the country and we intend to continue this evolution over the next 25 years.



In 2007, ADEQ launched an initiative which provided technical assistance to schools and school districts across the state to ensure that USTs owned and operated by schools and districts are properly maintained in accordance with the law to prevent leaks. ADEQ took over the management and cleanup on many of the sites where contamination was identified.

Electronic Waste Recycling



Nearly 875 Tons of E-waste Diverted from Landfills, Illegal Dumps

When Cottonwood Mayor Diane Joens began her regular hikes a few years back in the Verde Valley countryside, it wasn't the lovely vista of the nearby Mingus Mountain that caught her eye.

The real attention grabbers were the piles of shattered, discarded televisions and computer equipment that littered the arroyos on the edges of Cottonwood, leaching dangerous heavy metals like cadmium and lead into the soil and water.

"It was so deep in some areas that it was literally acting as a dam when it rained or there was snow runoff in the area," Joens said.

Stories such as these are why ADEQ began its Free Electronic Waste Recycling Program in August 2009. Since that time, the agency has sponsored 71 collection events from Duncan in the east to Lake Havasu City in the west and Nogales in the south to Page in the north. A total of 1.75 million pounds of e-waste, enough material to fill 175 large moving vans, have been collected from more than 12,000 motorists attending the events.

The fourth year of the program began in August 2012.

The program has filled a huge void in many rural areas of the state where there had been no such recycling in the past and the waste would have likely ended up illegally dumped in the countryside or taking up large amounts of valuable space in landfills.

For example, ADEQ sponsored the largest e-waste recycling event in state history when 161,000 pounds - more than 80 tons - of discarded electronics were collected in Show Low in August 2010, filling a need in Navajo and Apache counties. The same goes in Mohave County, where the first three such events ever in Lake Havasu City collected nearly 80,000 pounds of e-waste and in Gila County, where three events in Globe took in 60,000 pounds.

The program also has served big cities and Native American reservations. Nearly 1,500 motorists brought recyclable material to two events in the Southwest Valley and more than 100,000 pounds were collected in an event on the Hopi Reservation.



1997

Community Advisory Boards were established for State Superfund sites.

In mid-2009, more than \$2 million in annual legislative funding to ADEQ to maintain recycling programs in the state was ended. We immediately turned our attention to determine what to do to retain a recycling presence in the state that we could maintain without funding.

Enter the free e-waste recycling program, which takes collaboration among the state, municipalities, counties, Native American tribes, non-governmental organizations and private industry to new heights in achieving significant environmental results. Our co-sponsors now total 45 Arizona towns, cities and communities that range in size from Heber-Overgaard to Phoenix, 35 corporations and businesses from tiny Benson Lumber to corporate giant Freeport McMoRan and 25 non-governmental organizations like Friends of the Santa Cruz River, Casa Grande Clean and Beautiful and Gila Watershed Partnership.



Here is the way the program works:

Private electronic waste recycling companies in Arizona that want to participate -- and four companies have been certified -- submit detailed paperwork about their businesses, the recycling practices they use and what happens to the recycled materials they send downstream.

ADEQ's technical analysts in the Waste Programs Division use available state and federal databases to investigate companies for past environmental violations and proper business licensing. They also require companies to file "downstream" reports detailing what they do with their recycled material. ADEQ also is currently acting as a conduit to two of the three companies who are not R2 certified to attain that certification by the end of 2012.

Our agency determines the sites of e-waste events by identifying those communities which have been underserved by recyclers in the past. In return for ADEQ putting the most effective partnership together to maximize turnout and attract volunteers plus publicizing the events, the private companies agree to accept all electronics waste for free, including televisions.

Because of the effective partnerships we put together and the free publicity we receive because of press releases sent to media outlets plus social networking, we generate enough volume at the events to ensure that the companies return a profit.

It's a win-win situation because the recyclers make money, the citizens of Arizona can get rid of their aging electronics for free rather than helter skelter disposal and it's personally rewarding to ADEQ workers because they are doing good works in Arizona communities.

ADEQ's Highlighted Free Electronic Waste Collection Events			
Date	Place	# of Vehicles	Pounds Collected
Aug. 21, 2010	Wal-Mart parking lot, Show Low	341	163,936
Sept. 17, 2011	Hopi Veterans Memorial Center parking lot, Second Mesa	104	65,000
Nov. 13, 2010	Glendale Community College, Glendale	672	60,189
Jan. 29, 2011	Estrella Mountain Community College, Avondale	750	58,524
March 26, 2011	Sundome parking lot, Sun City West	700	55,960
Sept. 17, 2011	Gillespie Park, Holbrook	59	47,274
April 28, 2012	Rodeo Grounds, Williams	60	46,913
April 7, 2012	5 Whole Foods Markets, Valley	328	39,544
Feb. 11, 2012	Public Works Yard, Cottonwood	416	35,353
Feb. 19, 2011	City hall parking lot, Lake Havasu City	275	34,216
May 15, 2010	Basha's parking lot, Thatcher	64	30,053
Jan. 30, 2010	2 Whole Foods Markets, Tucson	250	29,480
Sept. 18, 2010	2 Home Depot parking lots, Flagstaff	266	28,364
Sept. 17, 2011	Cultural Arts Building parking lot, Page	66	23,781
March 28, 2012	Multi-Event Center parking lot, Payson	166	23,350

Brownfields Program



Converting Contaminated Land into Productive Property

It was the largest Brownfield cleanup in Arizona history, a massive 117-acre project that turned an area of multiple tire fires and law enforcement headaches into the sparkling shopping and entertainment district now known as Tempe Marketplace.

Arizona Department of Environmental Quality workers really had their work cut out for them when the cleanup project began in 2004. The site had previously been contaminated by three large unregulated dumps, 11,000 cubic yards of soil contaminated by lead, 130 septic tanks and leach pits, 42 drums of hazardous waste and 260,000 tons of buried construction and household debris.

Now, Tempe Marketplace is the state's largest outdoor retail, entertainment and dining destination, creating 4,800 jobs, \$110 million in annual wages and \$24.5 million in sales tax revenue since it opened. The redevelopment effort also came with praise from high places.

During the last nine years, ADEQ's Brownfields Program has funded a total of nearly \$1.4 million in projects at 27 different sites around the state. A brownfield is an abandoned or under-used property with an active redevelopment potential that suffers from known or perceived environmental contamination.



"Built on a former Superfund site, Tempe Marketplace is considered the largest brownfield clean-up in the history of Arizona. The 117-acre site went from unofficial landfill - a source of multiple tire fires and law enforcement headaches - to the successful open-air, regional shopping, dining and entertainment destination that it is today. Tempe Marketplace is a true environmental success story for Tempe. We were proud to partner with the Arizona Department of Environmental Quality on a project that contributes to the long-term sustainability of the community - environmentally, economically and socially."

-Hugh Hallman
Former Mayor of Tempe





In Winslow (pictured above), Brownfields Program money was put to excellent use when the city's leading tourist attraction, Standin' On The Corner Park, was ravaged by fire in 2004 that destroyed a large wall and a huge, popular mural painted on it. Concerns about asbestos contamination in the charred rubble had prevented efforts to remove the debris and reopen the park. ADEQ funded \$315,000 for cleanup and technical oversight and the site was reopened to visitors.

In Flagstaff, the city had a pressing need for a central bus station to operate its Mountain Line transit system. But in the way was redeveloping a vacant lot contaminated by hydrocarbons from railroad petroleum products. Brownfields money in 2008 paid for environmental site assessments and the city now has a fully operational, modern transit center in downtown on Phoenix Avenue.



The Flagstaff Transit Center.

In southern Arizona, Brownfields funding came riding to the rescue to save Camp Naco, the only surviving fort on the Mexican border manned by the famed "buffalo soldiers" of African-American heritage in the 19th Century. A 2006 fire at the site scattered asbestos-containing roofing material and cleanup funds allowed historic preservation of the building to continue.

10 More Brownfields Success Stories		
Year	Place	Project
2010	Apache Junction	Soil testing allows city to pursue developing 240-acre site
2010	Flagstaff	Biosolids testing allows renewable energy project to advance
2010	Globe	Old public library asbestos survey clears way for demolition
2009	Show Low	Petroleum found, clean up plan at new public library site
2009	St. Johns	Petroleum, asbestos abatement at future city hall site
2009	Surprise	Assessment allows water recharge site to move forward
2009	Willcox	960-acre airport site cleared for development
2007	Winslow	Historic lot near Route 66 cleared for development
2010	Youngtown	Former public works yard readied for development
2005	Yuma	Lead identified, cleaned up at local park



Emergency Response



Above: Checking to make sure the equipment is working properly. ADEQ emergency responders figure out where to place the portable monitors.

Rural Communities Depend on ADEQ's Emergency Response Team

As the state's largest wildfire ever, the Wallow Fire, incinerated half a million acres in June 2011, the Arizona Department of Environmental Quality's emergency response team quickly rolled into action.

ADEQ staff was on the point for the State of Arizona in protecting the public's health from the dense smoke conditions. They assisted Apache County officials in providing air quality data and forecasts and determining when the evacuation of the Towns of Springerville and Eagar would end. Agency workers coordinated the state's response to inquiries from dozens of members of the national media that had flocked to what was then the largest active wildfire in the country.

Emergency responders from ADEQ were the first State agency personnel allowed into the fire-damaged areas and they assessed the risk of hazardous materials in and around the communities of Alpine, Nutrioso and Greer.

"ADEQ's commitment to being part of the solution to this regional tragedy lifted our spirits and provided an extra degree of confidence with our massive Wallow Fire recovery undertaking," Apache County Manager Delwin Wengert later wrote in a letter to the agency.

But that was only the beginning.

ADEQ's Water Quality Division staff explained how to bring water systems back on line and up to pressure and made sure burn area residents understood the impacts of fire, firefighting and the transport of ash and sedimentation and effects on water quality of area streams and lakes. Staff worked to identify landfills and public water and wastewater treatment facilities that were impacted by the fire and warned about pollution and infrastructure damage when monsoon rains begin.



2001

EPA announced that Phoenix metro area met the one-hour air quality health standard for ground-level ozone.

In the weeks and months that followed, ADEQ personnel continued lending technical expertise on particulate monitoring, debris removal and waste disposal as well as drinking water and wastewater issues. They even figured out a way to provide \$250,000 in federal Clean Water Act grant funding to local agencies for projects that would help prevent erosion and protect water quality in the burn area. ADEQ's community liaisons provided regular briefings for civic leaders and residents and coordinated communication between agency staff, county health departments and other agencies.

ADEQ's Emergency Response Unit, funded primarily by the agency's WQARF program, originally was created to minimize the threat to public safety, human health and the environment from chemical spills, fire explosions and other pollutant releases round the clock and throughout the state. But the larger the emergency event, the more that ADEQ's Air, Water Quality and Waste Programs divisions will help out in follow-up actions during recovery operations.

Take, for example, what the ADEQ role was in what had been the state's largest wildfire before Wallow, the Rodeo-Chedeski fire of 2002. For weeks ADEQ had nearly constant, round-the-clock support from its air monitoring and assessment teams, which provided data that local health officials used to keep residents near the burn area informed about the health effects from the smoke.

At the same time, water quality and waste disposal experts helped identify threats to drinking water systems and underground fuel storage tanks by charting and predicting the daily fire lines.

When the fire ended, ADEQ personnel worked tirelessly to speed the return of residents to their homes by surveying burned areas for hazardous materials, rapidly providing area residents with information about the quality of area drinking water, and increasing its monitoring frequency for downstream rivers and lakes. The department also provided invaluable assistance to nearly 500 homeowners who lost their homes in the Heber-Overgaard area by analyzing infrastructure needs in the recovery.

ADEQ staff received a distinguished service award from the U.S. Forest Service for the department's efforts.

The department worked with city and county officials to allow property owners to bury burned trees and vegetation that would normally have required landfill disposal. The ADEQ Recycling Program purchased two wood chippers for Navajo County to support efforts by private property owners to clear their property of damaged or destroyed trees or other vegetation. ADEQ also awarded a \$413,640 water quality improvement grant to the Arizona Community Tree Council's "Trees for the Rim" project, which provided trees and other vegetation, at no cost, to private property owners whose trees and landscape plants were destroyed during the fire.



Above: The haz mat team prepares during an emergency drill.

Below: The aftermath of a fire brings more concerns.



Below: The 2010 Schultz fire on the east side of Humphreys Peak.



Cleaning Arizona's Water



Above: Palo Verde Nuclear Generating Station uses reclaimed water for all its cooling. About 60 million gallons of reclaimed water from metropolitan Phoenix is sent daily by a 35 mile pipeline to the largest nuclear generating plant in the country where it undergoes further polishing at an advanced water treatment facility before being used in the reactor cooling towers. A predictable supply of reclaimed water is essential to the continued operation of this important power generation facility.

Arizona a Pioneer in Reuse of Reclaimed Wastewater

Currently, nearly 200 million gallons per day of reclaimed water are available as part of Arizona's water supply. This high quality reclaimed water is used to irrigate golf courses, parks and schoolyards, is used to recharge groundwater aquifers, and provides critical supplies for industrial and power generation needs. Further, use of reclaimed water reduces groundwater pumping and preserves water resources for the future.



The chart on the right shows the majority of the permits are Type 2. Type 2 reclaimed general permits are issued to end users for direct reuse.

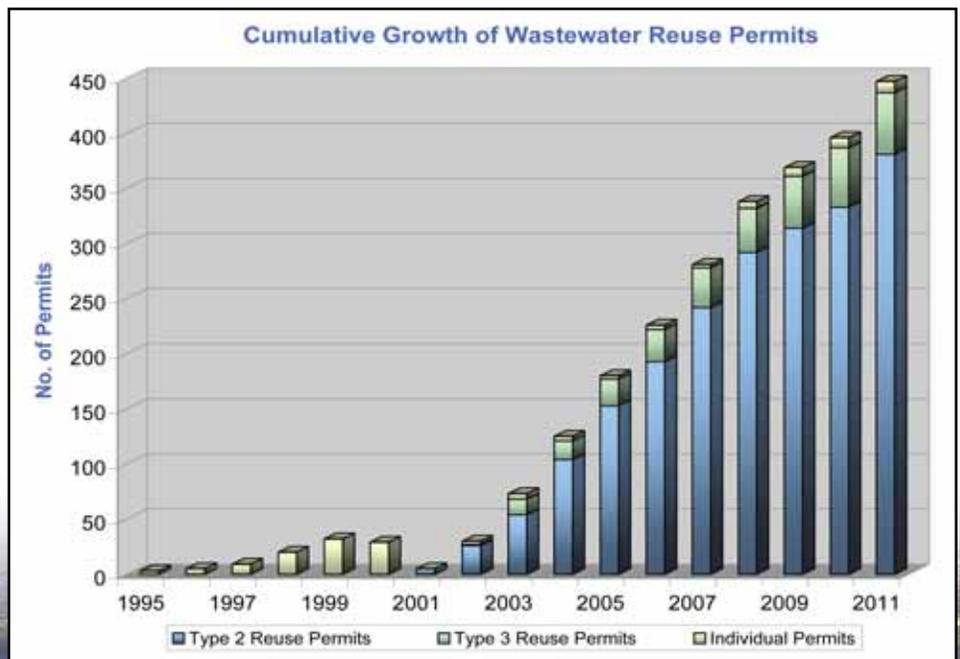
Type 3 permits are issued to companies that provide reclaimed water for direct reuse to more than one end user or irrigates with flows between 400 and 3,000 gallons per day.

Trailblazing Aquifer Protection Permitting Program Slashes Nitrogen Releases to the Environment and Transforms a Waste into a Resource

When you live in the desert, you learn to appreciate every drop of water, whether it is above the surface or beneath it. This is especially true when the annual average rainfall is less than 8 inches and temperatures soar above 100 degrees for months of the year.

That's why the Arizona Aquifer Protection Permit (APP) program was the first comprehensive groundwater protection program in the nation when it was adopted during the Arizona Department of Environmental Quality's first year of existence in 1987. In its 25 years, the APP program has issued permits to thousands of facilities in the state, from septic tanks and small wastewater treatment plants to large metal mining operations covering many square miles.

Under the program, all groundwater is protected for drinking water use and discharges cannot cause an exceedance of a drinking water standard in groundwater. A key focus of the program is to minimize the discharge of nitrogen to less than 10 milligrams per liter. That's accomplished by requiring new and expanding wastewater facilities to use the best available demonstrated control technologies.



Because of the APP program, much less nitrogen has been released from the majority of municipal wastewater reclamation facilities throughout Arizona. Major changes to the APP program in 2001 also greatly advanced the safe reuse of reclaimed water throughout the state. The reductions in nitrogen have been achieved as existing wastewater treatment plants (WWTPs) have expanded and upgraded their technologies, and new wastewater treatment plants have been installed in areas previously dependent on septic tanks. All have been required to install nitrogen removal technologies.

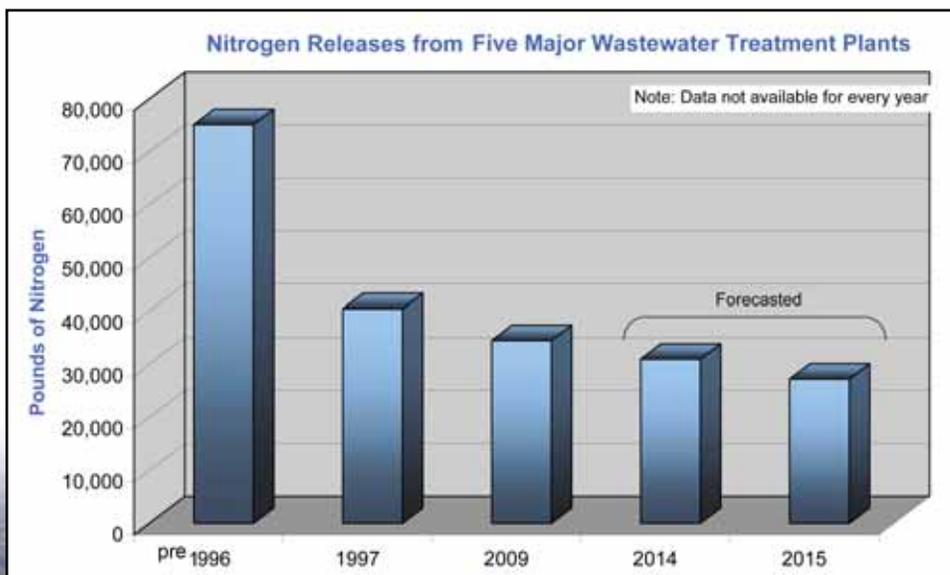
The cumulative amount of nitrogen released per day before 1996 from five of the largest major WWTPs in the state, was nearly 80,000 pounds a day. These five facilities include: the City of Phoenix's two main plants at 23rd Avenue and 91st Avenue, the Nogales international wastewater treatment facility, and Pima County's two main wastewater treatment plants at Ina Road and Roger Road. When the extensive upgrades to these two Pima County facilities are completed in 2014-2015, that cumulative total of nitrogen released per day will have been reduced to less than 20,000 pounds a day, nearly a fourfold decrease in 20 years. Under the upgrade, the current Roger Road plant will be decommissioned and replaced by a new state-of-the-art water reclamation facility.

The requirement to reduce and remove nitrogen has the added benefit of improving surface water habitat due to the removal of ammonia, a form of nitrogen that is toxic to fish and other aquatic life. Fish populations and other water quality indicators have shown documented improvements in streams below upgraded wastewater treatment plants. The advanced treatment of wastewater to remove nitrogen also allows the wastewater to be put to other beneficial uses such as increased riparian habitat, artificial lakes and recreational opportunities.

Reclaimed water - the highly treated water from wastewater treatment plants - has become an increasingly important part of Arizona's water supply and ADEQ has had a formal reclaimed water program since 1979.

Because stringent treatment and quality standards are now met at the wastewater treatment plant where the reclaimed water is produced, ADEQ was able to create a simplified permit program for users of reclaimed water.

This simplified regulatory framework has incentivized the use of reclaimed water, turning what was once a "waste" into a resource. Prior to 2001, reclaimed systems required individual reuse permits, a lengthy and sometimes costly process. Once the new framework was in place in 2001, the number of reuse permits has increased significantly as did the uses of reclaimed water.



BEFORE



Nearly 350 acres of Yuma East Wetlands on the Colorado River has been restored since the project began in 2004. The 1,400-acre project is restoring riparian habitat, wetlands creation and excavating a channel. During the initial conversion of the land to cottonwood-willow and other native habitats, effluent from the City of Yuma's wastewater treatment plant was used to irrigate the area.



AFTER

2004

School Bus Idling Reduction Program was initiated.

Water Quality Improvement Grant Program



Keeping Sediment, Nitrogen and Phosphorous from Polluting Arizona's Waterways

Back in the late 1990s, Nutrioso Creek, located in the eastern Arizona highlands of southern Apache County, was the poster child for a once-lovely mountain creek where paradise had been lost.

Stream banks were denuded and eroded because of heavy cattle grazing and forestry management practices from decades ago that did not control runoff. Sediment from the Apache-Sitgreaves National

Forests filled the creek bed and turned the water into a murky brown color.

Enter ADEQ's Water Quality Improvement Grant (WQIG) Program. Seven different projects along nearly 13 miles of the creek later, the stream banks have been stabilized, fences built, trees and other vegetation flourish and the sinewy twists and turns and water clarity have returned to the bed of Nutrioso Creek. It's been taken off the state's impaired waters list and the native Little Colorado spinedace has been reintroduced.

Arizona's WQIG Program, funded under the federal Clean Water Act by the U.S. Environmental Protection Agency, began in 2002 and has been very successful in keeping sediments, nitrogen and phosphorous from polluting the state's waterways. Grant recipients include private landowners, schools, Native American tribes, cities, counties, watershed partnerships, non-profit groups and other state agencies.

Since the program's inception, about \$20 million in federal money has been spent on dozens of projects, primarily in the watersheds of the Verde River and Oak Creek, Salt River, Upper Gila River, Little Colorado River, and the San Pedro River. Over the years the program has increased its emphasis on watershed planning and has developed four community-led watershed plans across the state, which will have top priority in funding for the future.

Between 2002 and 2007, the program kept an estimated 362,000 tons of sediment out of the water and between 2004 and 2009 an estimated 360,000 pounds of nitrogen and phosphorous also did not pollute waterways.

Uncontrolled sedimentation fills stream bottoms, decreasing spawning areas and

habitat for the food chain of fish. Excessive amounts of nitrogen and phosphorous in the water can lead to huge algae blooms being produced, aquatic dead zones because of lack of oxygen and increased risk of human exposure to toxic microorganisms.

Jan Holder, executive director of the Gila Watershed Partnership of Arizona in Safford, said the WQIG Program has done wonders in cleaning up and protecting water in the state's back country. The partnership has worked on numerous projects protecting the water quality and riparian areas of the Upper Gila and San Francisco rivers along with Eagle Creek in eastern Arizona.



2005

Arizona bans the use of methyl tertiary butyl ether (MTBE) in gasoline.

About \$1.3 million in WQIG funding has also been the determining factor in the success of the Prescott Creeks organization's efforts to restore four lengthy reaches of Granite Creek to their natural dimensions after the area was pulverized by sand and gravel operations for several decades.

"We would not be here if it wasn't for those funds," Prescott Creeks Executive Director Michael Byrd said. "Because of that money we were able to do channel restoration which led to thousands of volunteers helping with that. And that led to thousands of additional extra hikers using the adjoining Peavine Trail to go to Watson and Willow lakes."



Then there is all the work currently being done in the targeted watersheds across the state.

In Sedona and Benson, volunteer watershed groups funded by WQIG, are examining ways to improve the problems posed by E. coli contamination in Oak Creek and the San Pedro River, respectively. Volunteers from Apache, Graham, and Greenlee counties are examining the same issue in the San Francisco River drainage area.

Developing solutions for the sedimentation problems in the Little Colorado River near the towns of Springerville and Eagar are being considered by a volunteer group in that area.



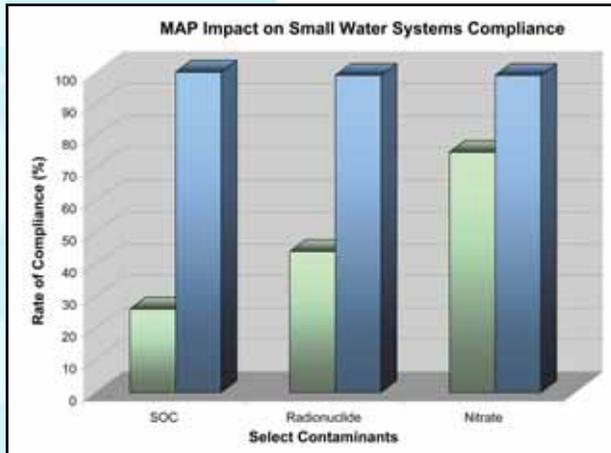
"There has been a complete culture shift in this area in less than 10 years. People used to be completely negative about any presence of state government in these parts. Now, not only do they praise how their favorite recreation area has changed for the better, they also are some of our best volunteers in doing watershed work. Large corporations like Freeport McMoRan are also donating money to these causes."

- Jan Holder
Executive Director, Gila Watershed Partnership of Arizona



Water Monitoring

Monitoring Assistance Program Helps Small Water Systems Provide Safe, Healthy Drinking Water



In the early 1990s, Arizona's small public water systems found themselves in a real bind.

The U.S. Environmental Protection Agency, under the Safe Drinking Water Act, added 49 new pollutants that required testing. The state's smaller water systems, serving 10,000 or fewer customers, were hit particularly hard as many of the tests would cost between \$3,000

and \$4,000 per sample for laboratory analysis.

ADEQ began its Monitoring Assistance Program (MAP) to lessen the monitoring and financial burdens faced by systems to ensure that water served met state and federal safe drinking water standards.

MAP has been quite the success story. Before the program began in 1999, 697 of those systems, almost three-fourths of the systems in the state, did not conduct proper monitoring nor report the results to the state to determine compliance with state and federal standards. That number was reduced to just nine water systems by 2010, which is less than 2 percent not in compliance.

"The Monitoring Assistance Program was a tremendous help to a lot of the systems I interacted with throughout the state," said Flavio Gonzalez, operations manager for Bella Vista Water Company in Sierra Vista. "Some systems went from paying thousands of dollars a year in laboratory costs down to paying only a few hundred dollars in MAP fees per year."

Because of MAP, the compliance rate for synthetic organic compounds like pesticides, herbicides and PCBs went from just 26 percent before the program began to 100 percent for participating public water systems from 2008 until 2010. MAP expanded to include asbestos, radionuclide, nitrite, sulfate and nickel monitoring in 2002 and the compliance rate increased from 44 percent to 99 percent. Nitrate monitoring was added in 2008 and the compliance rate has increased from 75 percent to 99 percent.

Prior to MAP, all public water systems were required to monitor for contaminants at prescribed schedules and at various locations in their system as required by the Safe Drinking Water Act. Monitoring was often required for multiple contaminants in multiple years and proved to be a challenge for many systems, especially smaller ones. Since introducing MAP, more small drinking water systems are being fully and accurately monitored and the results are provided to ADEQ, which keeps these small systems in compliance with complex reporting regulations, and ensures safe, healthy drinking water.

In Arizona, MAP currently provides assistance to 850 of the smaller public water systems, which is 55 percent of the total number of regulated public water systems in the state.



"MAP has really helped us in terms of continuity... Before MAP, we had compliance concerns related to missing sampling events."

-Darren Campbell
Director of Water Quality Testing,
Luke Air Force Base, Glendale



2007

The Small Communities Environmental Assistance Program was initiated.

Preventing Pollution



Pollution Prevention Saves Money

Later this year, ADEQ will become the first state environmental regulatory authority in the country to implement its own in-house environmental management system.

Everything within the agency's buildings will be examined to reduce the agency's environmental footprint. Records will be kept of waste management. Everything from energy usage to paper consumption to emissions reductions will be addressed.

This is just one of the areas in which ADEQ and the State of Arizona have been a pollution prevention leader since the state Legislature adopted a pollution prevention policy in 1991.



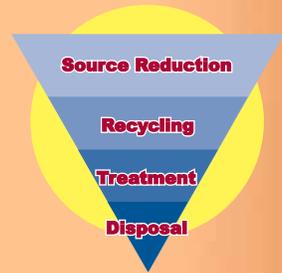
ADEQ launched a Performance Track Program in 2005 to encourage and reward businesses that are good environmental stewards and to encourage others to go above and beyond the minimum requirements of the law. Among the success stories are Ping Inc. of Phoenix, which decreased its energy usage by nearly a quarter; Intel Ocotillo of

Chandler, which dramatically reduced its emissions of volatile organic compounds; City of Scottsdale, which conserved more than 4,000 acres of habitat; and Xanterra South Rim, LLC, of the Grand Canyon, which reduced water usage more than 100 million gallons in the past decade.



ADEQ also introduced the Green Business Automotive Program in 2005, designed for auto shops to protect the environment and conserve resources through better front-office waste disposal practices, parts management programs, housekeeping, parts cleaning and degreasing, fluid recycling and reducing energy use.

The program, a partnership with AAA-Arizona, the Automotive Service Association of Arizona and City of Mesa, now has 65 member auto shops in the Valley and Tucson.



For the last two decades, ADEQ's Pollution Prevention (P2) Program has been working with Arizona industry to reduce or eliminate the use of toxic substances, the generation of hazardous waste and pollutant releases.

P2 has partnered with many sectors including aerospace, automotive, boats and marinas, electronics, government, medical services, mining, military, recycling and environmental remediation and utilities and manufacturing companies. It also has collaborated with builders and municipalities in promoting green building practices.

Here are the results, from 1992 through 2010:

Electrical Energy (Kilowatt Hours Saved)

572.8 million

Hazardous Waste (Pounds Prevented)

48.8 million

Air Pollutants (Pounds Prevented)

139.3 million

Solid Waste Disposal (Pounds Prevented)

331.9 million

Toxic Substances (Pounds Prevented)

41.8 million

Water Conserved (Gallons)

2.3 billion

Waste Water (Gallons Prevented)

332.1 million

Natural Gas (Therms Saved)

3.8 million

Greenhouse Gases (Pounds Prevented)

18.2 million



2008

Leaking underground storage tanks on school property program initiated and wins EPA Region 9 award for innovation.

Office of Children's Environmental Health



Educating our children on the 3 R's (reuse, reduce, recycle) are the fundamentals of the future

Transportation Supervisor Bill Patterson of Joseph City schools said he's happy that problems caused by diesel exhaust of idling school buses are a fading memory.

That's because the school district joined the No Idling Initiative for Schools soon after its inception in 2004. ADEQ's Office of Children's Environmental Health (CEH) developed the program to educate school bus drivers about the importance of reducing children's exposure to the harmful fumes emitted by idling buses.

The program, which has 158 districts and over 1,000 schools as members, instructs drivers to turn off buses when reaching a school and not turn on the engine until the vehicle is ready to depart. In addition buses should be parked at least 100 feet from a school air intake system.

"The students are able to load and unload the buses without the smell and negative health effects of diesel fumes," Patterson said. "This program has been a win-win for everyone."

The CEH office also has been involved with protecting the health and environment of Arizona's school children on other fronts. ADEQ's Air Quality Flag Program now has more than 50 participating schools. The program uses colored flags to alert students, teachers and parents about risks on high-pollution days.

Schools receive a daily air quality forecast from ADEQ's staff meteorologists with instructions to fly one of four flags: green for good air quality, yellow for moderate, orange for unhealthy for sensitive groups, and red for unhealthy for everyone. With the flag flying, parents of students with asthma or other breathing ailments know what to expect and teachers can take precautions to protect students on bad-air days.

The flag program coincided with an important 21-month study ADEQ launched in January 2005. The study, which analyzed more than 5,000 asthma events in Phoenix, established that the incidence of asthma among children between 5 and 18 years old increased by nearly 14 percent with elevated levels of particulate pollution.

The Children's Environmental Health Office also coordinates other educational activities.

During April's "Earth Month" and Governor Jan Brewer's "Green Week" in early February, CEH and other ADEQ public outreach representatives fan out across the state to conduct presentations in schools on recycling and how to prevent water pollution.

There are also many water quality testing events for schoolchildren. In the past five years, staff hydrologists have travelled around the state staging 21 testing events at water bodies for nearly 1,400 students.



Right: This pennant is flown at schools to let children know the air quality.





25th Anniversary Closing Message from the Director



The preceding stories offer a glimpse of the many ways in which the Arizona Department of Environmental Quality has touched the lives of Arizonans in our first 25 years as a state agency. I am honored to be one of the privileged few to have served as director of ADEQ, and the only one who joined the agency as a staff-level employee and worked in each of its three environmental program divisions. Over the years, I have worked along side of many talented and dedicated public servants, and I deeply appreciate the efforts of all the men and women who have furthered ADEQ's mission to protect public health and the environment of Arizona.

Since our inception, ADEQ's responsibilities have grown with each passing year. We helped bring about many environmental accomplishments against the backdrop of a thriving economy and a rising population but recent years have caused us to weather unprecedented challenges. Despite no longer receiving an annual General Fund appropriation, we stabilized new funding sources amid a struggling economy. We now rely solely on fees and federal grants for our operations. We significantly reduced staffing and restructured our organization in an effort to maintain core programs vital to the ADEQ mission. Through adversity, we have made great strides in reducing costs, improving operational efficiency and expanding our partnerships with the private sector so we can fulfill our commitments to Arizona taxpayers.

ADEQ today has a strong foundation upon which to build its future. As always, our success will depend heavily on the commitment of our staff, and we are undertaking new initiatives to restore capacity within our programs and unleash the potential of our employees. With our eyes fixed firmly on the horizon, ADEQ looks to provide balanced, leading-edge environmental protection while offering radical simplicity for both our customers and staff. It's my hope for ADEQ to be known as an organization committed to technical and operational excellence as we deliver the finest quality service in all of our endeavors.

We invite all Arizonans to join us in this experience, because ADEQ works for you. Our mission is vital, as is your continued support.

Sincerely,

A handwritten signature in blue ink, appearing to read "H. Darwin", with a long horizontal flourish extending to the right.

Henry R. Darwin
Director



Main Office

1110 W. Washington St.

Phoenix, AZ 85007

(602) 771-2300

(800) 234-5677

(602) 771-4829 (Hearing impaired)

Web site: www.azdeq.gov

