

EMISSIONS AND WASTE

We have policies to reduce or eliminate routine emissions of environmentally harmful substances such as:

- Greenhouse gases (GHGs)
- Ozone depleting substances (ODSs) as defined by the Montreal Protocol
- Key air pollutants including carbon monoxide, lead, volatile organic compounds, nitrogen oxides (NOx), particulate matter (PM-10), and sulfur oxides (SOx)

Throughout our system, we maintain air emissions per megawatt-hour generated at or below industry averages. We achieve this record by a combination of nuclear power, emissions control technology, improved power plant efficiency and a cleaner fuel mix.

All of our power plants are required by law to limit their emissions and operate within parameters set by federal, state and/or local environmental agencies. In addition, all major stationary sources of air pollution (including power plants) are required under Title V of the 1990 Clean Air Act Amendments to obtain air quality operating permits from local permitting authorities that are approved by the EPA.

In 1995, we submitted Title V permit applications for the West Phoenix, Ocotillo, Fairview, Yucca, Cholla and Palo Verde plants. The Saguaro Plant submitted its application in 1997 and the Four Corners Plant in 2000.

We continue to update our permit applications as required. The EPA has given interim approval of the State of Arizona, Maricopa County, and Pinal County, Title V permit programs.

In January 1999, the Arizona Department of Environmental Quality (ADEQ) issued a Title V permit to the Fairview Power Plant. Currently, ADEQ is reviewing the permit for Cholla. We have submitted comments to Maricopa County on the Ocotillo permit and the permit for the Palo Verde plant.

We schedule our power plants based on efficiency and operating cost. Over the past decade, our service territory has grown nearly 3.5 percent per year. This growth has brought higher system demands and many of our power plants that were previously used as peak demand plants are operating more. Although air emissions are showing an upward trend from 1996 levels, we maintain air emission well below industry averages.

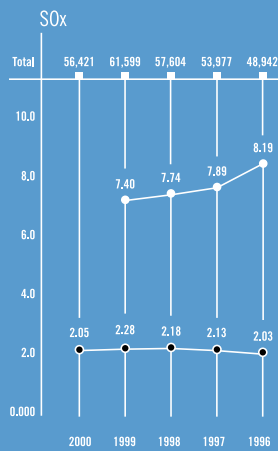
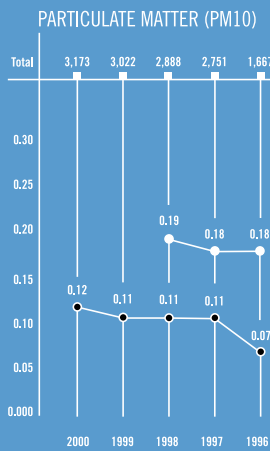
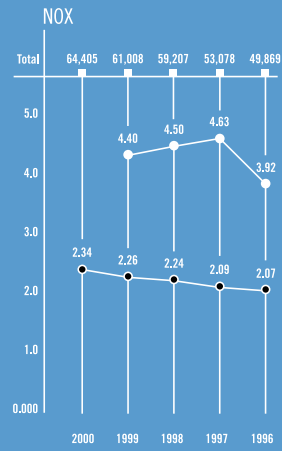
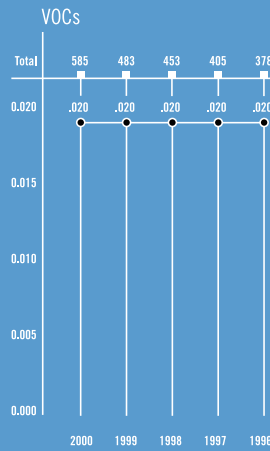
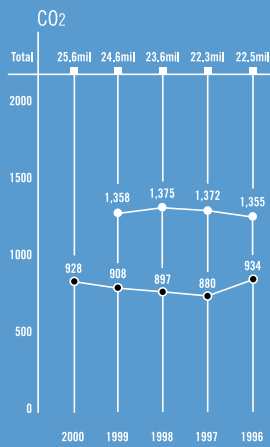
AMOUNT OF ROUTINE EMISSIONS IN TONS, BASED ON OWNERSHIP

	2000	1999	1998	1997
GREENHOUSE GASES				
• CO ₂	15,974,666	14,323,343	13,645,326	12,900,000
KEY AIR POLLUTANTS				
• VOCs	432	321	294	257
• NOx	39,070	34,294	35,710	31,560
• Particulate Matter (PM-10)	2,241	2,005	1,892	1,814
• SOx	26,881	28,488	31,949	32,616
• Mercury	0.233	0.21		
• Carbon Monoxide	3,234	2,532	2,323	
• Lead	0.24	0.22		

We track emissions in the plants we operate and the plants in which we hold ownership. We operate the Palo Verde, Four Corners, Cholla, West Phoenix, Ocotillo, Childs-Irving, Fairview, Yucca and Saguaro power plants. An explanation of our ownership holdings is on page 8.



AMOUNT OF ROUTINE EMISSIONS IN TONS, BASED ON OPERATIONS



OTHER 2000 EMISSIONS

CARBON MONOXIDE:

- 4,564 tons
- 0.17 normalized

LEAD:

- 0.28 tons
- 0.01 normalized

MERCURY:

- 0.42 tons
- 0.02 normalized

■ Total (in Tons) ● Normalized (in lbs/MWh) ● Industry Average (in lbs/MWh) *

*Industry and APS calculations include nuclear generation in the pounds per megawatt-hour normalization. Industry average source: National Air Pollutant Emissions Trends, 1990-1996 report, (EPA, 1997), Emissions of Greenhouse Gases in the United States (DOE/EIA-0573, 1996), Volume II of the Electric Power Annual for 1996 (DOE/EIA, 1997), need source for 1997, 1998 and 1999 industry numbers. Industry averages for 2000 emissions were not available at the time of publication.

Our Management Plan for ozone-depleting substances requires tracking the use of equipment containing chlorofluorocarbons (CFCs) and CFC-based refrigerants. The plan provides for proper maintenance and service of CFC-containing equipment to prevent CFC releases to the environment. Our policy is to replace old or obsolete CFC containing equipment with non-CFC chemicals as our operations allow.

Our commitment to reduce greenhouse gas emissions began when we became one of the first electric utilities to sign the Climate Participation Accord with the U.S. Department of Energy in 1994. With our signature, we agreed to limit our greenhouse gas emissions to 1990 levels by the year 2000.

By signing the Climate Participation Accord, we committed to a multi-pronged approach. In anticipation of above normal population and load growth in the Southwest, we acquired additional carbon dioxide (CO₂) credits from Niagara Mohawk Power Corporation (NMPC) to ensure we could meet our year 2000 commitment. In exchange for the CO₂ credits, we gave NMPC sulfur dioxide (SO₂) credits. NMPC has subsequently "retired" the SO₂ allowances, donating them to environmental organizations.

We also committed to help others reduce their global greenhouse gas emissions. For instance, we electrified a remote 400-person fishing village in Baja California Sur, Mexico, that previously relied on a diesel generator.

APS and NMPC in cooperation with Mexico's national utility, Commission Federal de Electricidad (CFE), completed the wind and solar hybrid power plant in April 1999. The new plant provides the community with power 24-hours-a-day, allowing it to further develop its commercial fishing and tourism business ventures without air emissions.

Designated as a pilot project under the U.S. Initiative on Joint Implementation (USIJI), the Baja California Sur project supports the U.S. National Action Plan on Global Climate Change to reduce greenhouse gas emissions.

REPORTING TOXIC RELEASES

In July 1999, we issued our first Toxics Release Inventory (TRI) report to the EPA under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). Previously, the EPA only required companies classified as manufacturing

industries to file annual TRI reports. The EPA expanded that list in May 1997 to include electric utilities and six other industry groups.

Our fossil fuel-fired power plants are required by EPA to track chemicals listed by EPA as TRI substances. Our coal-fired plants, Four Corners and Cholla, report metal quantities of barium, chromium, copper, lead, nickel and manganese. The plants also report hydrochloric, hydrofluoric and sulfuric acids. Additionally, Four Corners reports quantities of beryllium, cobalt, selenium and zinc. Our gas/oil plants began reporting releases in 2001, and we added five new substances.

The majority of the chemicals we report are captured by pollution control equipment or are contained in ash that is either stored in ash ponds on site or sent to the coal mine for reclamation. In 2000, we returned 1,060,767 tons of ash and scrubber sludge to the mine. The ash and scrubber sludge, used as back fill in the mine, are considered chemically stable and pose no environmental or health risk to the community.

While TRI quantities reported by APS and other utilities are large, EPA studies have concluded that health risks relative to the volume of the substances emitted from power plants are low.

Coal ash has many beneficial uses and we are working to sell much of that ash for use in cement products. We sold 484,047 tons of ash and cenospheres to Phoenix Cement Company in 2000 – a 10 percent increase over 1999. When ash is added to cement products, it enhances the strength and quality of the cement. Continued commitment to ash sales will help decrease some of our TRI numbers while providing a useful ingredient for other industries.

In 2000, our Four Corners Power Plant formed a partnership with Combustion Product Management to convert bottom ash into a number of marketable products. Course particles or oversized cinders are used for landscaping, fine particles are used to make cinder blocks; and unprocessed ash can be used as a road base material.



	lb. released to water	lb. released to air	lb. released to land	total lb. released
APS REPORTABLE RELEASES				
• Barium	0	3,414	2,717,959	2,721,373
• Benzo (ghi) perylene	0	.83	11.14	11.97
• Beryllium	77	26	24,132	24,235
• Chromium	0	616	133,809	134,452
• Cobalt	0	77	28,798	28,875
• Copper	5,311	729	228,553	234,593
• Dioxin	0	.01	0	.01
• Hydrochloric Acid	0	244,760	0	244,760
• Hydrofluoric Acid	0	299,094	0	299,094
• PACs	0	8.4	87	95.4
• Lead	4	769	198,748	199,521
• Manganese	420	1,618	430,682	432,720
• Mercury	1	669	87,001	87,671
• Nickel	1	669	87,001	87,671
• Selenium	0	791	25,093	25,884
• Sulfuric Acid	0	83,191	0	83,191
• Vanadium	0	730	336,965	337,695
• Zinc	2,324	1,512	140,961	144,797
• 2000 Total*	8,138	638,674	4,439,800	5,086,612
• 1999 Total	8,434	709,497	4,195,890	4,913,821
• 1998 Total	9,567	833,895	4,121,579	4,965,041

*2000 totals are rounded



San Juanico Baja California Sur, Mexico is the site of an APS-installed solar, wind power plant.

USED NUCLEAR MATERIAL

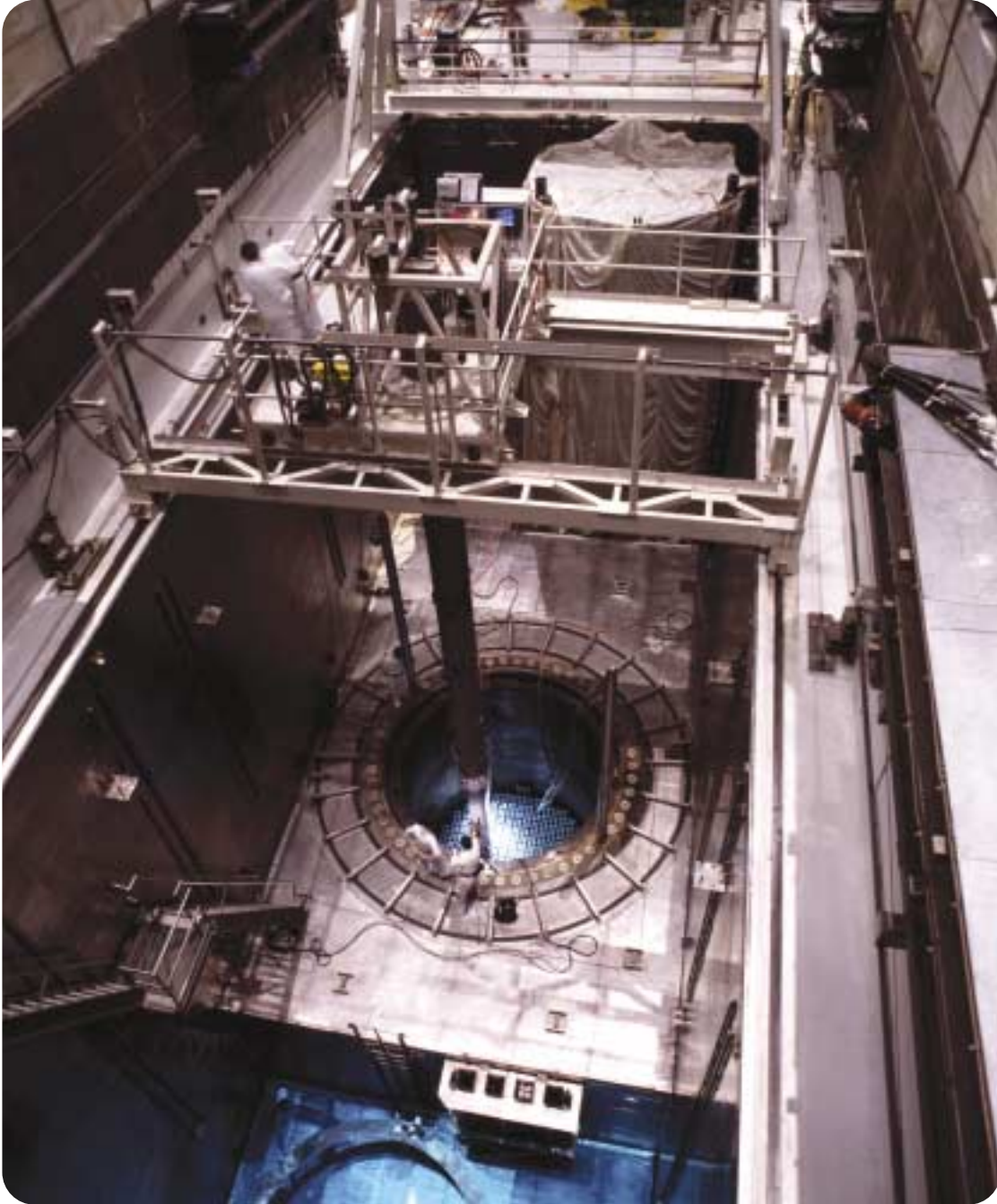
The Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC) rigorously control the management of the nuclear fuel cycle and its radioactive byproducts. Our Palo Verde plant was designed and built with facilities that safely store these wastes on site. In addition, we play an active role in shaping future legislation and regulations that affect the handling of radioactive waste.

There are two forms of radioactive waste produced by nuclear power plants like Palo Verde: high-level waste and low-level waste. High-level waste consists of relatively small amounts of uranium fuel. This used fuel is highly radioactive for many years, but can be safely isolated in above- or below-ground storage.

Low-level waste includes material and substances that have had some contact with the nuclear process and become radioactive. Although some low-level waste has been stored on-site in a low-level waste facility, we currently ship low-level waste to off-site facilities. We believe that interim low-level waste storage methods are or will be available for Palo Verde to continue operation and to safely store low-level waste until a permanent disposal facility is available.

We have existing fuel storage pools at Palo Verde and are in the process of completing construction of a new facility for on-site dry-storage of used fuel. With the existing storage pools and the addition of the new facility, we believe used fuel storage or disposal methods will be available for use by Palo Verde to allow continued operation through the term of the operating license for each of Palo Verde's three units. On average, Palo Verde permanently discharges 200 fuel assemblies annually. These discharged assemblies contain approximately 88 Metric Tons Uranium (MTU) and fission product inventory of 990 million curies.





Our Palo Verde nuclear power plant has adequate storage for used nuclear material.



HAZARDOUS WASTE

We have specific programs in place to reduce and minimize hazardous waste. Tracking our hazardous waste stream is accomplished through waste manifest data for hazardous wastes shipped off-site. With the exception of the Prescott service center, where we were remediating the MGP plant, all our facilities were either classified as Small Quantity Generator (SQG) or Conditionally Exempt Small Quantity Generators (CESQG) in 2000.

APS HAZARDOUS WASTE GENERATION

	2000	1999	1998	1997	1996
<i>TONS</i>					
	78.60*	24.33	23.80	20.80	23.00

**Includes 55.4 tons of soil removed during remediation of the Prescott Manufactured Gas Plant.*

APS hazardous waste primarily consists of light bulbs, solvents, paint waste, lead-based paint debris, and aerosol cans.

2000 MANAGEMENT OF HAZARDOUS WASTES

<i>MANAGEMENT TYPE</i>	<i>ONSITE (TONS)</i>	<i>OFFSITE (TONS)</i>
• Recycled	0	12.7
• Incinerated with energy recovery	0.5	0
• Incinerated without energy recovery	0	60.16
• Treated	0	0
• Landfilled	0	5.27

NON-HAZARDOUS WASTE

Our facilities employ a wide variety of pollution prevention activities based on their individual and diverse needs.

The Deer Valley Service Center is charged with managing the waste and recycling for our service centers and the gas/oil power plants. Through a centralized facility, we are able to implement a variety of reuse and recycling activities. In 2000, we recovered more than \$2.1 million through surplus sales, auctions and recycling activities while diverting more than 3,000 tons of solid waste from landfills.

APS WASTE MANAGEMENT BREAKDOWN (IN TONS)

	Volume Generated In 2000	Volume Generated In 1999	Volume Generated In 1998	Volume Generated In 1997
WASTE STREAM				
• Solid	6,988	127,398*	8,645	10,165
• Vegetative	10,800	NA**	3,000	8,516
• Electricity Manufacturing	2,158,500	2,524,748	2,433,451	3,918,261
• TOTAL	2,175,383	2,652,146	2,445,096	3,963,942

*Includes 120,851 tons of metal and aluminum recycled at the Deer Valley service center.

**Vegetative waste figures were not available in 1999.

	Tons of Waste Managed	Percentage
MANAGEMENT TYPE		
• Recycled/re-used	13,744	76.4
• Incinerated	38	0.21
• Landfilled	3,901	21.69
• Used for Energy Recovery	105	0.58
• Landfilled on-site	201	1.12
• TOTAL	17,989*	100

*Excludes electricity manufacturing by-products. We recycled/reused 1,544,814 tons of coal combustion products in 2000.

APS RECYCLED/REUSED MATERIALS BREAKDOWN 2000

	Tons	Percentage
MANAGEMENT TYPE		
• Paper and cardboard	347	2
• Vegetative	8,960	65
• Scrap metals	3,266	24
• Used oil	774	6
• Wood	300	2
• Miscellaneous	97	1
• TOTAL	13,744	100



In 2000, we remediated a historic manufactured gas plant in Prescott, Ariz.

MANAGING HISTORIC PROPERTIES

More than 1,500 Manufactured Gas Plants (MGPs) operated throughout the United States from the early 1800s to about 1950. The plants made synthetic gas for domestic heating and lighting purposes. Several predecessors of APS operated plants in Arizona communities including Phoenix, Globe, Miami, Prescott, Douglas and Yuma. The manufactured gas process created by-products including tar and oils, some of which remained at the sites after operations ceased.

We began evaluating each site in 1993 to address any remaining material that may have been generated by MGP activities. Additionally, we began remediating the sites in 1996 and continue monitoring ground water at the Phoenix, Yuma and Globe sites.

In 1999, under the Arizona Department of Environmental Quality's Voluntary Remediation Program, we began remediating the Prescott site, which is located on half of a six-acre parcel currently owned by APS. Initial studies of the site indicated there were surface and subsurface impacts as well as groundwater and surface water impacts which were related to the former MGP operations. Two health risk assessments have also been conducted to determine if there is a potential health risk for workers or nearby residents. Both studies showed that neither the public nor APS workers were at measurable increased risks associated with the site.

In 2000, we removed 96,120 tons of soil (manifested as special waste), 55 tons of soil (classified as hazardous waste) and treated 819,731 gallons of water. The 2000 cost of the project was \$7 million. In 2001, we will be working with the City of Prescott to turn the site into a park. In addition, we will begin monitoring groundwater and surface water to ensure the cleanup effort was successful in removing the contamination. We will be submitting a report summarizing the results of the remediation effort to ADEQ in 2001. We are continuing remediation of our other MGP sites.



2000 ACCIDENTAL RELEASES AND SPILL SUMMARY

We track oil and chemical releases and spills and provide required information to all regulatory agencies.

OIL SPILLS

- An estimated 20 gallons of non-pcb mineral oil spilled into an irrigation ditch when a transformer failed. The transformer was repaired, but the oil washed away and was not recovered.
- Nearly 10 gallons of non-pcb mineral oil spilled onto a parking lot when a transformer failed. Some of the oil reached a storm sewer and the visible oil was cleaned.
- Approximately 50 gallons of hydraulic oil was spilled when a line truck tipped into a dry wash. All contaminated soil was removed and disposed of.

CHEMICAL SPILLS

- About 25 gallons of sulfuric acid was discharged into a sump at the Four Corners Power Plant. The spill was contained and cleaned up.
- Approximately 37,500 gallons of chlorinated secondary treated effluent water was released to a sedimentation basin at Palo Verde.

OTHER RELEASES

- Approximately 200,000 gallons of water containing slurried bottom ash was released into a dry streambed at the Cholla Power Plant when a bottom ash pipeline ruptured. The spill was cleaned and the vacuumed ash was returned to the ash pond.
- Nearly 500 gallons of water containing ash was released when a discharge pipe ruptured at the Cholla Power Plant. The pipe was repaired and the spill was cleaned up.
- A blow-down reuse pipe was damaged releasing 8,045 gallons of water at Palo Verde; 4,000 gallons were recovered.

SPILL PREVENTION AND LEAK DETECTION

We have spill prevention counter measure plans for facilities that have a potential to release into waters of the United States. At a minimum, all fuel, oil or waste oil storage tanks contain engineering controls for secondary containment. Our secondary containment engineering controls help ensure that spills and leaks are captured and not allowed to exit APS property. Examples of secondary containment include double-walled tanks, concrete containment and liners.

We physically inspect exterior portions of our natural gas pipelines annually and immediately repair any leaks. We have no on-site natural gas storage facilities.

When coal is delivered to the power plants, the piles are treated with a chemical surfactant to minimize dust. The power plants also implement secondary containment measures to collect any storm runoff from coal piles. Fly ash from the coal-fired power plants is stored in wet disposal ponds, sent to the mine for reclamation or sold to a local cement company for use in concrete products. We monitor ground water around the ash ponds quarterly and annually for self-evaluation and regulatory reporting.



SPILL HISTORY

	Oil Spills	Chemical Spills	Other Releases
2000			
• Released to Land (number / gallons)	1 ^a / 50	2 ^b / 37,525	3 ^c / 208,545
• Released to Water (number / gallons)	2 ^d / 30	0 / 0	0 / 0
• Released to Air (number / gallons)	0 / 0	0 / 0	0 / 0
1999			
• Released to Land (number / gallons)	6 ^e / 3	0 / 0	2 ^f / 38,300
• Released to Water (number / gallons)	1 ^g / 25	0 / 0	2 ^h / 400
• Released to Air (number / gallons)	0 / 0	0 / 0	0 / 0
1998			
• Released to Land (number / gallons)	0 / 0	3 ⁱ / 603	0 / 0
• Released to Water (number / gallons)	0 / 0	0 / 0	5 ^j / 480
• Released to Air (number / gallons)	0 / 0	0 / 0	0 / 0

(a) 50 gallons of hydraulic oil spilled when a line truck tipped into a dry wash.

(b) 25 gallons of sulfuric acid discharged into a sump at the Four Corners Power Plant. 37,500 gallons of chlorinated secondary treated effluent water was released to a sedimentation basin.

(c) 200,000 gallons of water containing slurried bottom ash was released into a dry streambed at the Cholla Power Plant when a bottom ash pipeline ruptured. 500 gallons of water containing ash was released when a discharge pipe ruptured. A blow-down reuse pipe was damaged and 8,045 gallons of water was released at the Palo Verde Plant, 4,000 gallons were recovered.

(d) 20 gallons of non-PCB mineral oil spilled into irrigation ditch when a transformer failed. 10 gallons of non-PCB mineral oil spilled onto a parking lot and into a storm sewer.

(e) 8 ounces of mineral oil containing PCBs spilled when a capacitor bushing failed. Two unknown quantities of mineral oil containing PCBs leaked from transformers. Less than 3 gallons of mineral oil containing PCBs released when a capacitor ruptured. Two capacitors ruptured, seeping PCBs but no oil reached the ground. An unknown quantity of non-PCB mineral oil spilled when a transformer fell off a line truck.

(f) 7,300 gallons of non-radioactive water to an unlined storm water drain. 31,000 gallons of water from a HVAC cooling tower into and unlined storm water ditch.

(g) 25 gallons of oil discharged into a canal at the Four Corners Plant when turbine lube oil leaked.

(h) 300 gallons of water containing fly ash released into a canal when a pipe failed. 100 gallons of low-volume wastewater released into a canal when equipment failed.

(i) 600 gallons of 96 percent sulfuric acid. .5 gallons of mineral oil containing PCBs from a transformer. 2 gallons of mineral oil containing PCBs from a capacitor.

(j) 280 gallons of water from a spray pond filter at Palo Verde. Three separate discharges at Four Corners, two of 100 gallons each and one of unknown quantity.