

The Path Forward Senate Bill 229



CLEANER, HEALTHIER AIR FOR COLORADO

2003



ENVIRONMENTAL DEFENSE
finding the ways that work



**The Land and Water Fund
of the Rockies**

Cleaner, Healthier Air for Colorado Senate Bill 229

The Colorado General Assembly is considering Senate Bill 229 that will provide cleaner, healthier air for Colorado. The Bill would expand the state's successful voluntary emissions reduction program that was established by legislation in 1998. Senate Bill 229 will dramatically lower sulfur dioxide and nitrogen oxides pollution from three Front Range coal-fired power plants: Cherokee, Comanche, and Pawnee. Total air pollution would be cut by more than 30,000 tons each year beginning in 2008.

- ✓ *The pollution of harmful sulfur dioxide from Front Range power plants would be more than halved under Senate Bill 229 and the 1998 law from 70,000 tons in 2001 to 30,000 tons in 2008.*
- ✓ *The nitrogen oxides cuts under Senate Bill 229 alone would be comparable to removing more than 185,000 passenger vehicles from the road.*
- ✓ *No cost-recovery would be authorized until the pollution reductions are implemented in 2008, and there are built-in cost safeguards for consumers. Senate Bill 229 requires that any electric rate increase born by Xcel Energy's electric customers will be less than two-tenths of a cent per kilowatt hour. That translates into a cost increase of about \$1 per month for a typical residential customer's electric bill and about \$2.25 per month for the typical business customer.*

Curbing the pollution from these power plants is the single most cost-effective strategy that can be implemented to protect public health and the environment from the adverse impacts of air pollution.

A clean air legacy for Colorado's children

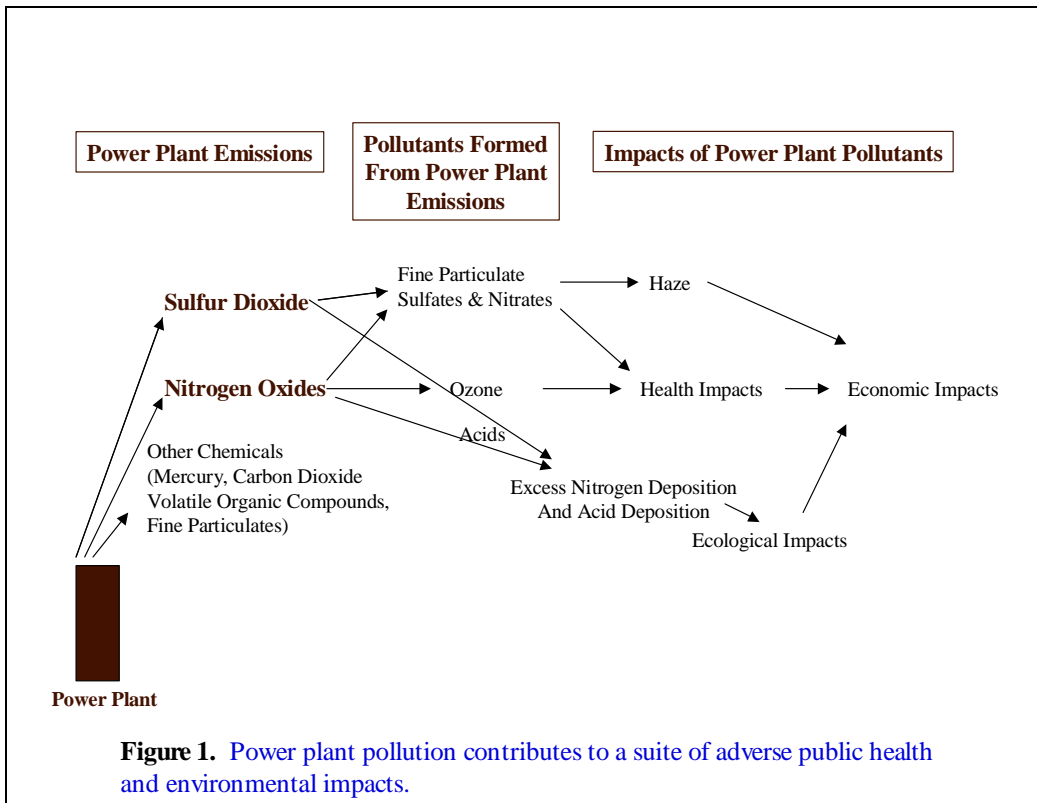
We have made important progress in addressing air pollution in Colorado over the past 20 years. For that, all Coloradoans should be proud. Everyone has some role in that historic success. At the same time, important air pollution challenges remain.

Air quality throughout the Front Range still needs to be improved and protected. Ground-level ozone or "smog" concentrations are on the verge of violating the national health standards. Visibility along the Front Range and in the National Parks is impaired.

And nitrogen deposition that adversely affects sensitive lakes, soils and ecosystems is increasing throughout the region. In addition, acid deposition remains a threat to high elevation lakes and forests.

Power plants are one of Colorado’s largest single sources of air pollution. And, as illustrated in Figure 1, power plant emissions of sulfur dioxide and nitrogen oxides contribute to adverse health impacts associated with ozone and fine particulate matter, degradation in visual air quality, and excess nitrogen and acid deposition.

The good news is that highly cost-effective solutions are available. Cleaning up harmful pollution from Front Range power plants, which is at the heart of Colorado Senate Bill 229, is a sound investment in protecting public health and our quality of life. Enacting Senate Bill 229 into law will help secure a clean air legacy for our children.



Power plants impact surrounding communities

Health effects due to fine particulate matter are a threat to Colorado’s Front Range communities. Fine particulate concentrations today are near the standards designed to protect human health. Fine particulates are mainly formed in the air from sulfur dioxide and nitrogen oxides, and power plants are key sources of these gases.

Recent studies by the Harvard School of Public Health examine the harmful health impacts in the immediate vicinities of power plants. These studies show that the health impacts due to sulfur dioxide and particulate matter directly emitted from a facility are the greatest within a few miles of the plant. While the effects from fine particulates formed in the air from sulfur dioxide and nitrogen oxide pollution will be distributed throughout the region, the impacts will be more prominent closer to the plants.

The serious health risks associated with fine particle concentrations include premature death, emergency room visits, asthma attacks, and incidents of respiratory symptoms. Children, the elderly and individuals with pre-existing cardiopulmonary diseases are most at risk. The table below shows the populations within 30 miles of the power plants to be cleaned up under Senate Bill 229. More than 2.5 million people live within 30 miles of the Cherokee, Comanche and Pawnee power plants, including more than 650,000 children.

**Exposure profile for populations within 30 miles of power plants
to be cleaned up under Senate Bill 229**

Power Plant	County	Exposed Population	Children Under 18	Children in Poverty	Pediatric Asthma
Cherokee	Adams	2,461,000	629,000	77,530	31,100
Comanche	Pueblo	181,318	42,868	11,448	2,599
Pawnee	Morgan	54,735	14,003	2,735	838
TOTAL		2,697,053	685,871	91,713	34,537

Data Sources: U.S. Census Population Estimates for 1997; “Estimated Prevalence and Incidence of Lung Disease by Lung Association Territory,” American Lung Association, 2001 (data is for 1998)

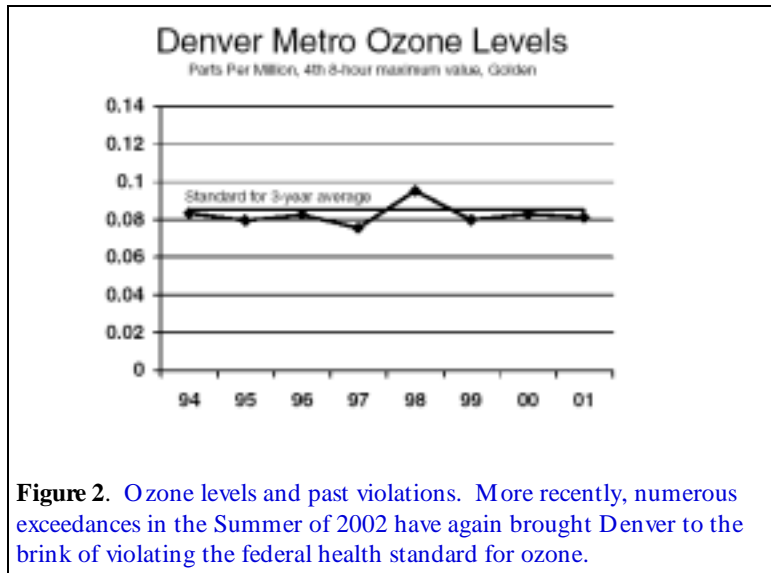
Summertime smog — a continuing health concern

Ground-level ozone or “smog” causes a number of adverse public health impacts. Ozone is formed from emissions of nitrogen oxides. When volatile organic compounds are present, the formation of ozone is enhanced. Nitrogen oxides and volatile organic compounds are both emitted from Colorado’s coal-fired power plants.

The spread of harmful levels of ozone that occurs throughout a region like the Front Range depends on the chemical reactivity of the volatile organic compound mix in the air, and on the relative amounts of nitrogen oxides and volatile organic compound emissions. The North American Research Strategy for Tropospheric Ozone, a major national assessment of ozone science, recommends a combined strategy to abate high ozone levels that includes reducing both volatile organic compounds and nitrogen oxides.

Figure 2, from the Colorado Air Quality Control Commission, shows the high ozone levels in the Denver metropolitan area over the past several years. Compliance with the health-based federal standard is based on 3-year averages. Denver violates the federal

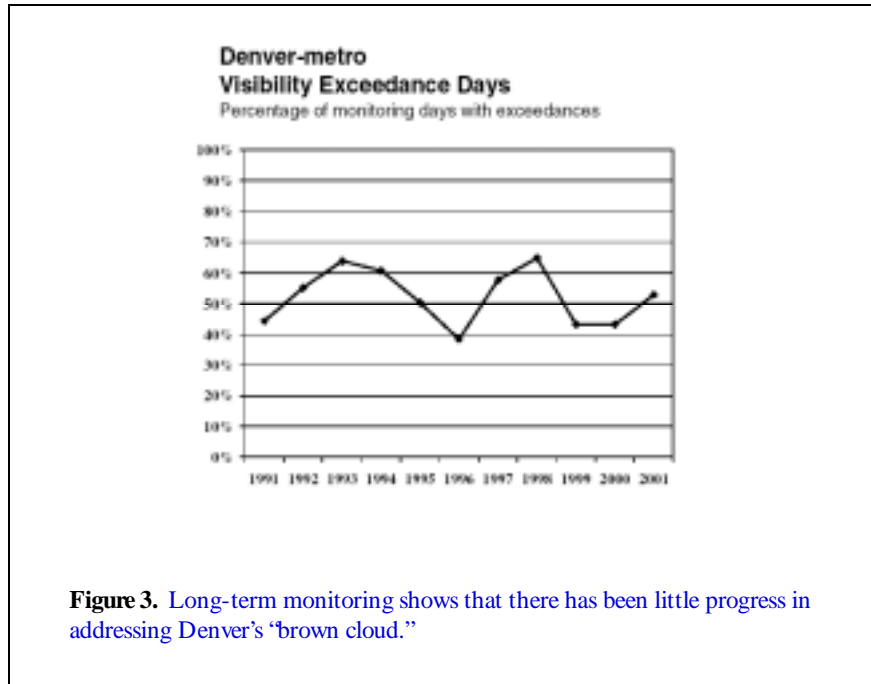
health standard or barely complies depending upon what 3-year average is considered. More recently, during the Summer of 2002, the federal health standard was exceeded on thirteen instances in the Denver area, bringing the area to the brink of violating the federal health standard.



High ozone levels are not confined to Denver’s urban area and increasingly have a broader geographic impact beyond the traditionally defined metropolitan area. Last Summer, the federal health standard at the Long’s Peak Ranger Station monitor in Rocky Mountain National Park was exceeded six times. This is consistent with the National Park Service’s long-term monitoring trends, which show that the ozone levels at Rocky Mountain National Park as well as at Mesa Verde National Park have progressively worsened over the past decade.

Hazy views throughout the region

The all too familiar Denver “brown cloud” has been part of our visual landscape for decades. Figure 3, from the Colorado Air Quality Control Commission, shows a recent rise in poor visibility days and that current conditions are worse than those during the outset of monitoring a decade ago. And, the “brown cloud” phenomenon, while not officially monitored as in Denver, is apparent throughout the Front Range from Fort Collins to Pueblo.



The “brown cloud” is caused by small particles in the air—the same small particles that have been implicated in multiple health problems. Power plants are the major source of sulfur dioxide that leads to these particles and are also a major source of haze-forming nitrogen oxides.

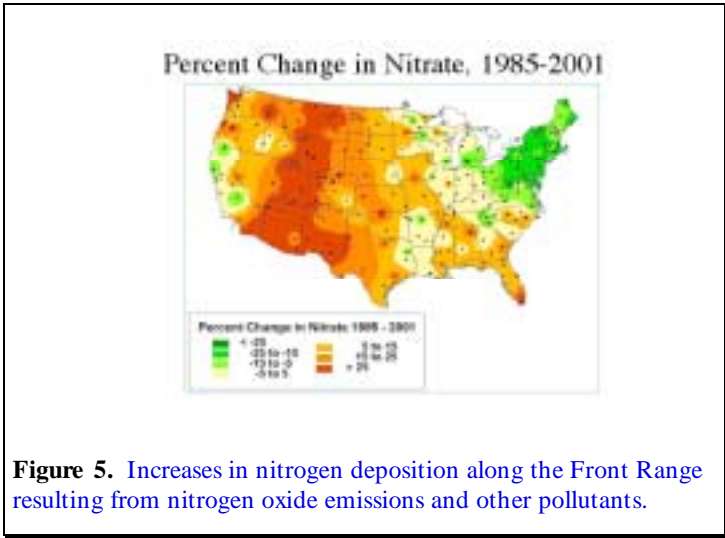
Haze also impairs visual air quality in our national parks and wilderness areas. Scenic vistas are integral to our quality of life. From revered areas like Rocky Mountain National Park to Grand Sand Dunes National Park, these magnificent vistas define Colorado and why we live here. The haze that degrades the beautiful vistas in these areas also is caused by the same fine particles that are derived from sulfur dioxide and nitrogen oxide pollutants that, to a large extent, come from Front Range power plants.

Power plants are a particularly important contributor to the haze in Colorado’s National Parks since pollutants are discharged from tall stacks and carried long distances to more remote areas. Figure 4 illustrates the difference between hazy and clearer views at Rocky Mountain National Park.



Excess nitrogen deposition

Nitrogen is important for life. However, too much nitrogen upsets ecosystem balances. Figure 5 shows the results of a recent U.S. Geological Survey report concluding that nitrogen deposition is increasing, in particular in high elevation areas east of the Continental Divide in the Front Range. The report found that the excess nitrogen loadings already have caused adverse impacts on soils and surface waters. Excess nitrogen in these more remote areas is greatly influenced by pollution discharged from the tall stacks of power plants.



Both sulfur dioxide and nitrogen oxides emitted from power plants also form sulfuric and nitric acid in the air. When these acids deposit onto sensitive lakes and soils, further

damage occurs as has been extensively documented by the National Acid Precipitation Assessment Program over the past 20 years.

Pollution abatement from Front Range power plants is highly cost-effective

Fortunately, technology to cut sulfur dioxide and nitrogen oxides pollution from power plants is available and highly cost-effective. Reductions can be achieved at reasonable costs. Indeed, compared with a number of other air pollution abatement strategies, the pollution cuts under Senate Bill 229 are one of the most highly cost-effective measures that can be implemented to lower these harmful air pollutants.

Senate Bill 229's focus on power plant emissions as a way of lowering harmful sulfur dioxides and nitrogen oxides also is a particularly important step as the electricity needs of a growing Colorado increase. And there are built-in cost safeguards for consumers, including provisions that ensure that any electric rate increase born by Xcel Energy's electric customers will be less than two-tenths of a cent per kilowatt hour. That translates into a cost increase of about \$1 per month for a typical residential customer's electric bill and about \$2.25 per month for the typical business customer.

Clean air and a healthy economy go hand-in-hand

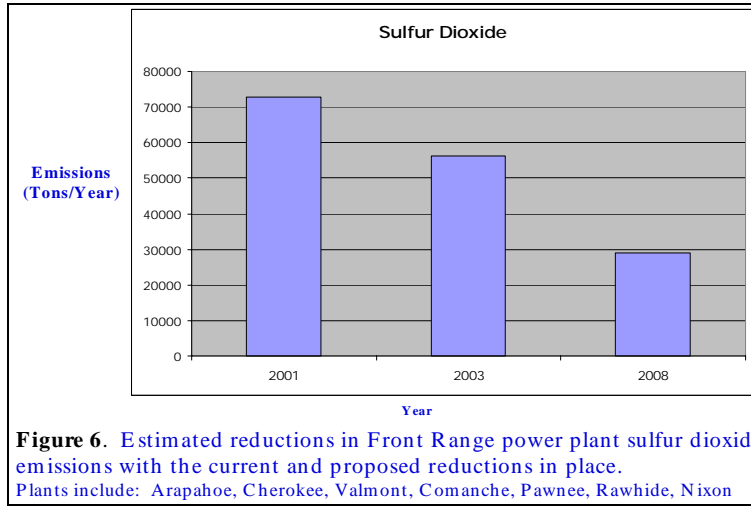
People move to Colorado, relocate businesses here, and travel from around the world to visit the Front Range of the Rockies because of our spectacular landscapes, blue skies and scenic vistas. Extensive surveys of metro citizens in the late 1990s as part of the Regional Air Quality Council's development of a *Blueprint for Clean Air* indicate that clean air is a highly valued aspect of the Colorado lifestyle. Protecting our air quality by lowering power plant air pollution will help attract new businesses to the Front Range and ensure that our economy grows in a sustainable way. Moreover, in the near-term, the installation of new controls on the Front Range power plants will create high-paying construction jobs. In short, investments in cleaning up air pollution make good sense for Colorado's economy.

The path forward: Senate Bill 229

The pollution cuts under the 1998 voluntary emissions reduction law made some significant progress in cutting harmful power plant pollution. Senate Bill 229 would build on that progress. Indeed, Senate Bill 229 would go well beyond the 1998 law in requiring more rigorous pollution cuts.

As Figure 6 below shows, the 1998 law will cut sulfur dioxide pollution by about 18,000 tons annually beginning in 2003. Under Senate Bill 229 sulfur dioxide from Front Range power plants would be slashed an additional 27,000 tons each year beginning in

2008. So, with both policies, the sulfur dioxide from Front Range power plants would drop from over 70,000 tons in 2001 to 30,000 tons in 2008.



And, smog-forming nitrogen oxides would be cut by about 3,600 tons annually. This is comparable to the pollution cuts that would be achieved by removing more than 185,000 passenger cars from the road.

These collective reductions will have enormous public health and environmental benefits for Colorado's families. Enacting Senate Bill 229 will help ensure a clean air legacy for Colorado's children.

Acknowledgment

Environmental Defense, and the Land and Water Fund of the Rockies thank atmospheric scientist Paulette Middleton, PhD, who is the principal author of this report.

For More Information Contact:

Vickie Patton
Senior Attorney
Rocky Mountain Office of Environmental Defense
2334 North Broadway
Boulder, CO 80304
303-440-4901

Environmental Defense links science, economics, and law to create innovative, equitable, and cost-effective solutions to the most urgent environmental problems.

John Nielsen
Energy Project Director
Land and Water Fund of the Rockies
2260 Baseline Road, Suite 200
Boulder, CO 80302
303-444-1188 x232

The Land and Water Fund of the Rockies is a regional environmental law and policy center serving the Interior West. It uses law, economics and policy analysis to protect land, air and water resources and assure that energy demands are met in an economically and environmentally sound manner.