

ENVIRONMENTAL SYNOPSIS

The Chairman's Corner

Rep. Scott E. Hutchinson, Chairman



Thomas Dolby had a hit song in the 1980's titled "She Blinded Me With Science." While admittedly a catchy tune, the Joint Legislative Air and Water Pollution Control and Conservation

Committee is singing an opposite song in its examination of the use of fly ash in mine reclamation. The committee wants to use science to open eyes and provide light and vision.

The committee has been asked to offer the Pennsylvania General Assembly a recommendation on whether there should be a statewide moratorium on the use of coal combustion waste (CCW), otherwise known as fly ash, for mine reclamation purposes. In order to gather the necessary information to make such a recommendation, the committee conducted a public hearing in Tamaqua, Schuylkill County, a site where CCW is being used to reclaim an abandoned mining pit, and where an expanded use of fly ash is being considered.

The issue is both an emotional one and a technically complicated one. The debate over the use of CCW is marked by impassioned opinions as much as by empirical evidence. There are many questions posed and a number of questions unanswered. The issue features a distinct historical perspective of the coal industry even as

it points to the future.

That said, the committee will use good, solid, peer-reviewed science and facts in conducting its study of the issue and in making its recommendation. The committee, as it did at the July 9 public hearing, will ask tough questions and seek diligently to find the facts.

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A Legislative Service Agency of the Pennsylvania General Assembly

NOTES FROM THE DIRECTOR

CRAIG D. BROOKS, DIRECTOR

There certainly weren't any gas stations around when French-born scientist Dr. Rudolf Diesel demonstrated his new compression ignition "diesel" engine in 1900. The fuel he used was vegetable oil, chemically similar to the soybean oil commonly used today as a feedstock for biodiesel fuel. Now - more than a century later - biodiesel is becoming a viable alternative fuel.

In the last decade alone, according to the National Biodiesel Board, biodiesel has gone from a nearly nonexistent market position to use in more than 100 major fleets in the United States. Biodiesel is now used in trucking, public transit, school districts, agriculture, public utilities, and military fleets.

But what is biodiesel? Biodiesel (fatty acid alkyl esters) is a diesel replacement fuel made from natural, renewable sources such as new and used soybean oil, vegetable oils and animal fats.

Biodiesel is produced by reacting fat or oil with an alcohol (such as methanol) and introducing a catalyst (such as sodium) to the mixture. The catalyst can then be recovered for reuse.

Much of the recent growth in the development and use of biodiesel is due to amendments to the federal Energy Policy Act of 1992 which allows fleets to earn alternative fuels acquisition credits by purchasing biodiesel blends with a ratio of 20 percent biodiesel and 80 percent petroleum diesel. Also, biodiesel fits relatively easily into our existing transportation fuels infrastructure.

Biodiesel can be blended in many different proportions. B20 (20 percent biodiesel) is a common blend, and pure unblended biodiesel is called B100 or "neat fuel". They are usually stored in standard tanks otherwise used for petroleum diesel. Biodiesel operates in compression-ignition engines and when blended with petroleum fuels (up to 20

percent) can be used in nearly all diesel equipment. These low blends (20 percent and less) don't require any engine modifications and can provide the same payload capacity as diesel engines.

Using biodiesel in a conventional diesel engine can reduce unburned hydrocarbons, carbon monoxide and particulate matter. A 1998 report by the US Department of Agriculture and Department of Energy showed a 78 percent reduction in carbon dioxide emissions from B100 compared to petroleum diesel. Sulfur oxides and sulfates can also be reduced.

The stage is set for increased use of biodiesel fuel in the future.

There are some drawbacks, however. Blends with higher biodiesel content are more likely to require modifications to the engine's fuel system. Pure biodiesel can cause rubber components and other engine components to fail. Fuel economy is often reduced and because it is not yet widely available, biodiesel can be more expensive than petroleum fuel. Biodiesel produced from soybeans costs about \$1.50 per gallon and biodiesel produced from fats and greases costs about \$1.00 per gallon. Also, emissions of nitrogen oxides show a slight increase.

In its share of the overall market for domestic transportation fuel, biodiesel is still small, contributing less than one-tenth of one percent. But annual production is increasing, growing from five million gallons in 2000 to more than 20 million in 2001.

Biodiesel is now produced in nine plants nationwide with approximately 14 more in development or under construction, setting the stage for increased use in the future.

RESEARCH BRIEFS

Each month, the committee's staff researches and prepares a number of "briefs" on several topics relevant to the Joint Conservation Committee's mission. Very often, these briefs include references to reports and further research on the topics so that readers may pursue issues on their own.

Excessive Demands on Water Use Blamed for Endangering Rivers

— Tony M. Guerrieri, Research Analyst

A proposal to drain 300 square miles of wetlands and scour more than 100 miles of river bottom to build the world's largest hydraulic pumping plant has landed Mississippi's Big Sunflower River at the top of the endangered rivers report issued annually by American Rivers - a Washington-based environmental advocacy group. Two rivers facing severe water shortages - the Klamath River in the Pacific Northwest and the Ipswich River in Massachusetts - round out the list's top three.

The report, *"America's Most Endangered Rivers of 2003"*, highlights 10 rivers facing the most urgent and imminent threats, as opposed to the worst chronic problems. It is not a list of the nation's most polluted rivers. According to American Rivers, many rivers are on this year's list because of severe water shortages. The five rivers listed below were placed on this year's list because of excessive demands on resources prompting a shortage in water and low flows.

■ The Klamath River (#2), which straddles the California-Oregon border, was the site of a massive fish kill in September 2002, when over 30,000 salmon were found dead. Diversion of Klamath River water to farmers in Oregon and Northern California bears much of the blame for the massive salmon die-off, according to a report by the California Department of Fish and Game.

■ The Ipswich (#3) in northeast Massachusetts, where consumers pump so much water from the aquifers below the river that it periodically flows backwards in places before drying up completely;

■ The Rio Grande (#5), where cities are looking to remove more water even though the river has dried up in stretches and twice failed to reach the sea in recent years;

■ The Mattaponi River (#6) in Virginia, where the city of Newport News seeks to satisfy speculative future

demands by constructing a reservoir in a remarkably pristine wetlands complex; and

■ The Platte River (#7), where falling groundwater reserves are the impetus behind proposed new dams and reservoirs that threaten a crucial wetland stopover for migratory birds.

The other rivers on the list are Colorado's Gunnison River (#4), burdened by unnatural water flows, along with the Snake River (#8) and Georgia's Tallapoosa River (#9), both threatened by impacts from dams, and also the Trinity River (#10) in Texas, which could be severely affected by planned flood control and flood-plain projects.

Water waste and sprawl development are cited as two culprits in fostering endangered river problems.

American Rivers pointed to extravagant water waste as one of the underlying reasons for this large and growing problem. According to the report, a chief culprit is irrigated agriculture, which accounts for 85 percent of the fresh water consumed in America - more than would be necessary to grow crops with modern technologies and techniques. Lavish federal subsidies and selective interpretation of Western water law compound these problems by removing the incentive for farmers to use water efficiently. Municipal water use is also skyrocketing, with new suburban estate homes and corporate campuses consuming far more water than traditional urban residences and businesses.

Sprawl development is an important and growing contributor to water shortages, not just through increased use but also by fueling habitat destruction in the watershed. The spread of concrete, asphalt, and turf grass blots out wetlands, forests, and other habitat - interrupting the natural movement of water between the surface and underground aquifers, according to the report. As a result, streams in heavily developed and denuded watersheds experience both lower average stream flows and more frequent flash floods.

The report recommends decision makers reform existing laws and policies that encourage water waste and fuel sprawl development. In particular, the report recommends trimming subsidies for irrigation water and price supports for thirsty crops in arid areas. Also, a

significant portion of federal infrastructure dollars currently earmarked for conventional water infrastructure should be redirected to land protection, habitat restoration, and "green infrastructure" retrofits in developed areas.

Finally, to ensure that healthy watersheds will continue to produce fresh water for people and wildlife, the report endorses scientists' calls for the establishment of a national ecological water reserve – a guaranteed baseline of healthy river flows that are protected by law.

Copies of the report are available at <http://www.amrivers.org/mostendangered/2003report.htm>.

Integrating the North American Electricity Market

—Jason H. Gross, Research Analyst

The Canadian Electricity Association recently released a report entitled "*Canadian Electricity and the Economy*". The report goes beyond Canadian issues, however, and is primarily centered on the North American electricity industry and how the Canadian and United States markets can work together for mutual benefit. According to the report, the North American electric industry is traditionally perceived as a reference of stability. But, says the report, there is an increasing amount of uncertainty in the industry because of three fundamental causes: 1) lack of clarity in market rules due to deregulation, 2) new environmental and regulatory controls, and 3) poor investment climate. The report addresses these issues and offers possible solutions.

The rules issue centers around the hazy state of market deregulation currently occurring in both the United States and Canada. The model of state-owned or sanctioned monopolies is being eroded in some areas while in other jurisdictions it is still the norm. Even in areas where state-owned monopolies continue to exist, a shakeup of the industry structure is taking place, due to deregulation in neighboring jurisdictions. Growing sub-sectors such as independent power generation and green power are adding further complication to an already uncertain market. The changes that deregulation, independent power generators, and green power have brought to a traditionally stable and consistent market have altered the way that business is done for the better in the long run, but also created uncertainty in the short term.

New rules and regulations offer long-term stability but first the market must adapt to new regulations being promulgated by federal, state, and Canadian governments. New U.S. Federal Energy Regulatory Commission rules that encourage a regional transmission organization are contributing to a feeling of uncertainty within the industry as electricity producers scramble to adapt to the new regulatory challenges. The new

policies are designed to restructure highly regulated markets into competitive markets. Unfortunately, the transition has been uneven with higher cost jurisdictions moving earlier and further than smaller, more local jurisdictions. Compounding these changes are new environmental regulations that continue to put more restrictive emissions controls on electricity producers. Energy producers are confronted with a double-headed challenge of new regulations that alters the marketplace and new environmental controls.

A globally poor investment climate is depressing investment in all markets, but especially in the electricity market, compounding the effects of market deregulation and new regulatory controls. Electricity market investors are shying away from further investment. One of the root causes for global economic uncertainty stems from the Enron corporate scandal, which originated within the electricity industry. Investors have been wary of investing in an industry that is at the center of the Enron situation and the Telecom market deflation. The lack of investor and consumer confidence is a serious challenge to the construction of needed generation and transmission projects that could affect capacity and customers.

Market rules, regulatory changes and investment climate are behind uncertainty in the electricity industry.

The report states that uncertainty in the electric industry will be reduced greatly by promoting opportunities to enhance cross-border trade and environmental performance. According to the report, spreading out the electricity market among several open and complementary markets will create a unified approach that will stabilize the larger electricity marketplace in North America. To this end, the report recommends increased participation in regional transmission organizations (RTO). RTOs create an increased focus on formulating harmony in market rules. Standardizing market rules through RTOs will eliminate undue discrimination, rate flattening, and transmission constraints.

Environmental concerns that create uncertainty can be addressed by developing a North American comprehensive strategy to manage green house gas (GHG) emissions. One tool in achieving overall GHG reduction is to introduce a broad North American emissions credit and trading program. In order for this to occur, an accurate and standardized method of accounting for GHG emissions must be created so that standardized protocols for reporting emissions can be used in the functioning of a trading program. Once a standard is reached, multinational trading of credits can occur which will in turn limit, through market forces, overall GHG emissions.

According to the report, in order for the North American electric industry to prosper in the future three things must occur: 1) policy makers must embrace a large, non-discriminatory, bi-national regional marketplace for electricity; 2) regulators must coordinate and collaborate in setting clear and certain rules respectful of and accommodating jurisdictional realities; and 3) investors must see a reasonable rate of return.

Further information and a copy of the full report are available at <http://www.canelect.ca/english/Pdfs/NAEE03finalpdf.pdf>.

Public Drinking Water Systems Report Improved Financial Situations

—Tony M. Guerrieri, Research Analyst

Americans rely on their drinking water to be clean and safe. Regulated under the Safe Drinking Water Act, community drinking water systems are critical elements in the nation's infrastructure. Recently, the U.S. Environmental Protection Agency (EPA) released a comprehensive survey focusing on the operating and financial characteristics of a nationally representative sample of community water systems.

The EPA defines a community water system as a public water system that provides water to at least 15 locations or 25 residents year-round. For the survey, the EPA selected a sample of 1,806 systems, out of about 52,000. The EPA conducts the survey to get a clear picture of current conditions in these water systems.

Used by the agency to support development and evaluation of drinking water regulations, policies, and implementation and compliance analysis, the "2000 Community Water System Survey" emphasizes that most of the operating characteristics of community water systems are unchanged from 1976, when the first community water system survey was conducted. The vast majority of systems are small and privately owned, but most people still receive their water from large publicly owned systems.

The survey does indicate an overall improvement in water system financial performance, including a ten percent decline in the percentage of systems operating at a loss. In 1995, about 40 percent of utilities surveyed by the EPA said they were operating at a loss or deficit, whereas in 2000 the figure had decreased to 30 percent.

However, financial data is only part of the picture. The survey also gathers information on the operating characteristics of the treatment systems, storage facilities and distribution systems. This data is critical in estimating the need for new facilities as a consequence of any new EPA regulation.

The data shows that the average revenue and expenses increased slightly more than the inflation rate over the past five years and that community water systems invested nearly \$53 billion in capital improvements over the past five years. Only 22 percent of that investment went for treatment.

The largest share of the \$53 billion, about 47 percent, was spent on distribution and transmission lines. The EPA reports that 50,000 miles of line were replaced over the past five years at a cost of \$4 billion, leaving most buried lines less than 40 years old and less than five percent more than 80 years old.

The lion's share of community water systems' operational spending went toward distribution and transmission lines.

Water storage accounted for about 12 percent of the total amount spent, according to the survey. The rest of the investments, about \$11 billion, was spent for land, source development, and other activities.

The survey also shows that:

- Approximately 17 percent of community water systems relied on support from the Drinking Water State Revolving Fund (DWSRF) for capital improvements, with nearly 20 percent of all capital costs for publicly owned systems serving 10,000 or fewer being financed with DWSRF loans.

- Few small systems use increasing-block rate structures (seven percent of systems serving less than 500; 15.4 percent of those serving 501 to 3,300; 13.4 percent of those serving 3,301 to 10,000; and 18.3 percent of those serving 10,001 to 100,000) compared to large systems (27.5 percent of those serving more than 100,000).

- While the total number of community water systems increased by almost four percent, the number of systems serving up to 100 people declined by more than eight percent. This decline was offset by increases in the number of systems serving 101-3,300 persons, so that the total number of systems serving fewer than 3,300 grew by one percent. Systems serving more than 3,300 persons grew by nearly 20 percent.

Previous EPA drinking water community surveys were conducted in 1976, 1982, 1986, and 1995. The EPA survey includes a 58-page summary along with a 194-page companion document containing dozens of data tables and an explanation of the survey methodology.

The EPA's report can be found at www.epa.gov/OGWDW/cwssvr.html.

Nitrogen Pollution in Coastal Waters

—Jason H. Gross, Research Analyst

The Hubbard Brook Research Foundation recently released a report entitled “*Nitrogen Pollution: From the Sources To The Sea*”. The report seeks to draw attention to the emergence of nitrogen as a major pollutant and as a pressing environmental issue in the 21st century. The report focused on nitrogen pollution in the northeastern United States in an effort to understand nitrogen’s sources, its effects, and how it can be best reduced. According to the report, if reactive nitrogen in the environment is not reduced it has the risk of polluting the coastal waters of the northeastern United States and ruining miles of valuable coastal waters.

The report states the two biggest sources of nitrogen pollution stem from food production and consumption. Nitrogen in food is the largest source of reactive nitrogen found in the northeastern watersheds that the study examined. Food as it is consumed releases excess nitrogen as a byproduct. Nitrogen not processed by the human body enters into septic systems and if not fully removed by septic systems, discharges into rivers and coastal waters through a leaching process, contributing to water quality problems.

Food production and consumption are the two largest sources of nitrogen pollution.

Fertilizer for food production is very high in nitrogen. Fertilizer is washed from the soil by water runoff, which carries the nitrogen into watersheds and coastal waters. The nitrogen from fertilizer and undigested nitrogen in food products together create very high levels of nitrogen in estuaries and coastal waters. The northeastern United States is particularly prone to high levels of nitrogen because it both produces and consumes large quantities of food.

According to the report, high nitrogen levels contribute to ground-level ozone, acid rain and acidification of soil and surface waters. Ground-level ozone is formed when nitrogen and volatile organic compounds combine in the presence of high temperatures and sunlight to form ozone. In the Northeast, high concentrations of ground-level ozone can have adverse effects on human health and the environment. Ozone presents a major health risk for humans, wildlife, and trees since high ozone levels inhibit the ability of both animals and plants to respire.

Nitrogen in the form of nitric acid is one of the two major contributors to acid rain. Nitrogen is also the major contributor to episodic acidification that raises the

short-term acidity in surface waters. Acid rain can cause fundamental changes in soils, forests, and streams, leaching nutrients, destroying tree growth, and killing delicate ecosystems.

Nitrogen pollution along the northeastern coast of the United States has the effect of over-enriching the water. Once reactive nitrogen enters a watershed through food waste, atmospheric deposition, or fertilizers some of it is retained within the soil or returns to the atmosphere. Much of it flows downstream to coastal estuaries into the eight watersheds that were analyzed in the study. The high population density in the Northeast generates large amounts of reactive nitrogen that enter the coastal waterways.

Agricultural and urban runoff is also a major contributor to the loading of reactive nitrogen in estuaries. The over-enrichment of estuaries by nitrogen promotes excessive growth of algae. The algal growth cuts off air and sun supply to seagrass beds. This in turn unbalances the ecosystem and lowers the oxygen that can be consumed by sea-life. This creates hypoxia among fish and shellfish that causes widespread death amongst a wide range of valuable species.

The study examined the most effective ways to control nitrogen emissions. According to the report, leaching of nitrogen at the source must be stopped in order to reduce the enrichment of coastal waters. Nitrogen removal from wastewater at a basin-wide scale is the most effective means of reducing nitrogen loading in estuaries in the Northeast. The study shows that proper wastewater treatment results in the largest improvements in pollution reduction from septic waste systems.

For more information and a copy of the full report please go to <http://hubbardbrook.org/hbrf/nitrogen/Nitrogen.pdf>.

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The *Environmental Synopsis* is issued monthly.

The newsletter examines timely issues concerning environmental protection and natural resources.

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ON THE HORIZON . . .

A LOOK AT UPCOMING EVENTS

✓ **Monday, October 6, 12 noon, Hearing Room 1, Ground Floor, North Office Building, Capitol complex, Harrisburg, PA - Environmental Issues Forum.** The special guest speaker will be Robert B. McKinstry, Jr., the Maurice K. Goddard Professor of Forestry and Environmental Resources Conservation at Penn State University (the "Goddard Chair"). Professor McKinstry will discuss the report he and a 25-member committee prepared which offers recommendations to the Rendell Administration on environmental and natural resources priorities.

✓ **September 22-23, Holiday Inn, Grantville - Innovative Trail Design Workshop.** Sponsored by the Pennsylvania Recreation and Park Society (PRPS), with support from the PA Department of Conservation and Natural Resources (DCNR), this 12-hour course will concentrate on how natural surface trails are shaped and includes both indoor instruction and outdoor design and evaluation. For more information, contact PRPS at 814-234-4272, e-mail prpslisa@vicon.net or visit www.prps.org.

Environmental Issues Forums are open to the public. Please call the committee office at (717) 787-7570 if you would like to attend.

COMMITTEE CHRONICLES . . .

REVIEW OF SOME MEMORABLE
COMMITTEE EVENTS

Scenes from the committee's public hearing on a statewide fly ash moratorium. The hearing was held on July 9 in the Tamaqua Area Middle School in Tamaqua, Schuylkill County.

For more on the hearing and the fly ash issue, see The Chairman's Corner on page 1.



The committee listens to testimony

Representatives of DEP and EPA offer testimony to the committee



A portion of the crowd at the hearing



While facts are foremost, they are not the only consideration, however. In the words of French scientist and author Jules Henri Poincare, "Science is facts. Just as houses are made of stones, so is science made of facts. But a pile of stones is not a house and a collection of facts is not necessarily science."



As testimony received by the committee indicated, just as there are concerns about the use of fly ash, there are serious statewide concerns about coal mine safety in terms of acid mine drainage, in pedestrian safety around abandoned workings, and mine subsidence. Just as there are concerns about the impact of fly ash on water quality, there are concerns about the future of cogeneration and its level of employment. And, just as there are concerns about dirt, dust and transportation impacts, there are concerns about the progress of abandoned mine reclamation and revegetation.

All of the above issues were the subjects of testimony at the committee's hearing. Many highlighted differences of opinion and presented differences in matters of fact and in their interpretation. It is the committee's mandate to weigh all the facts, both agreed upon and subject to debate, consider both the shared and conflicting concerns, seek to reconcile the concerns, and use good science to make a recommendation.

The committee prides itself on its history and integral role in offering legislation and recommendations that have helped the Pennsylvania General Assembly to strengthen the Commonwealth's environment. For example, the committee has been somewhat of a pioneer in assisting in the clean up of abandoned coal mines. As far back as 1983, the committee held hearings, issued two reports and made several legislative recommendations regarding remining and reclamation.

There is an old Chinese proverb which states, "Facts speak louder than eloquence," and another anonymous proverb which reads, "Facts do not cease to exist because they are ignored." The committee's goal is to formulate a straightforward, scientific report, which will make up in factual content whatever it may lack in eloquence.



How to Contact The Joint Conservation Committee

Phone:
717-787-7570

Fax:
717-772-3836

Location:
Rm. 408, Finance Bldg.

Internet Website:
<http://jcc.legis.state.pa.us>

Mail:
Joint Conservation Committee
PA House of Representatives
House Box 202254
Harrisburg, PA 17120-2254

