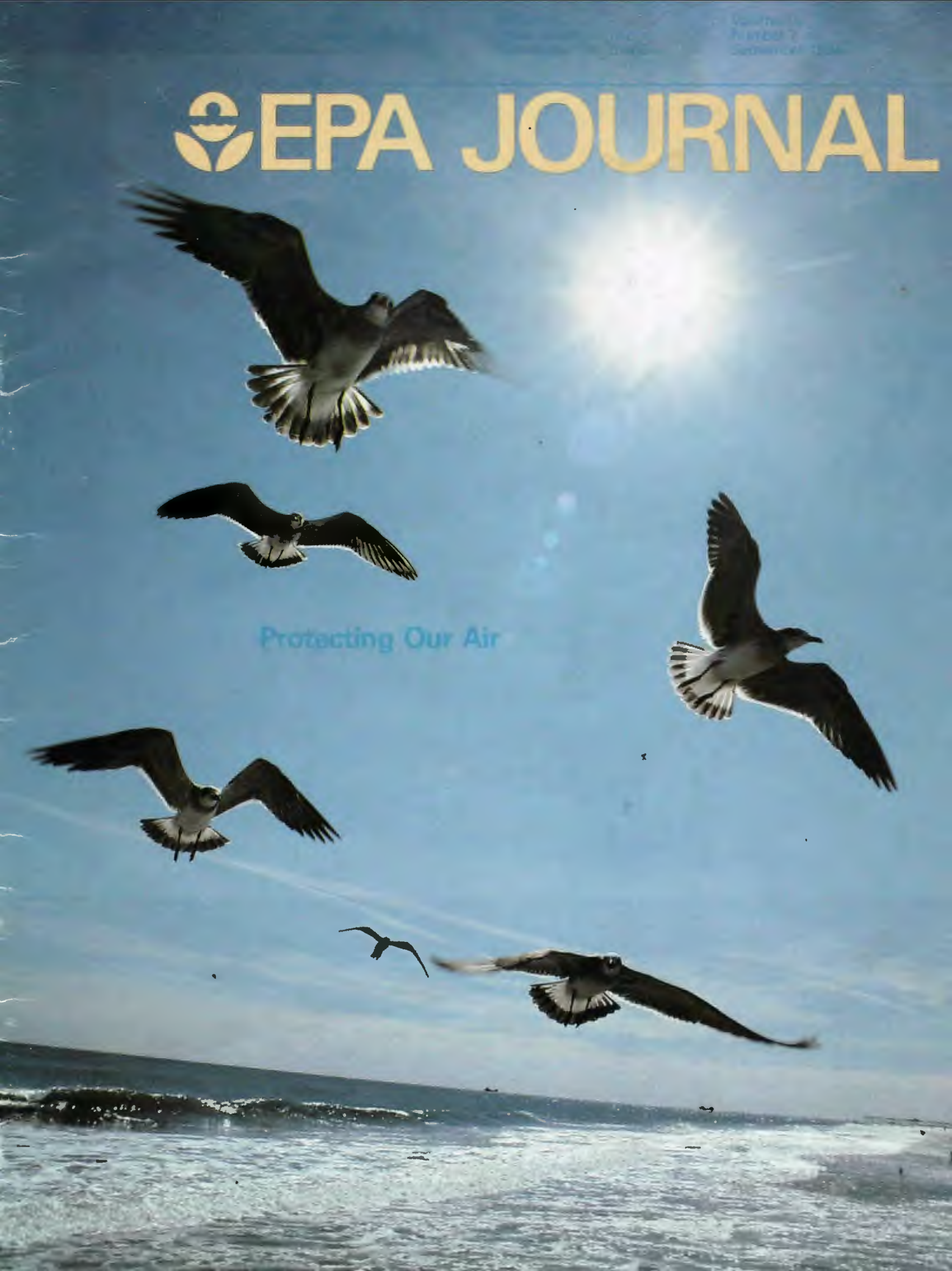
EPA JOURNAL



Protecting Our Air

Protecting Our Air

As measured by levels of several key pollutants, the quality of the nation's air is improving steadily. This issue of the EPA Journal discusses the national air cleanup effort.

In an interview, EPA's Assistant Administrator for Air and Radiation, Joseph A. Cannon, reviews the air quality situation. He discusses goals for the remainder of the decade and also compares America's cleanup progress with that of other nations. Administrator William D. Ruckelshaus discusses a specific air quality issue, acid rain.

The control of hazardous air pollutants, a major EPA concern, is assessed. Another article reports on the implications of a recent Supreme Court decision upholding a key EPA concept in regulating industrial air pollution. In another piece, a respected academic observer gives an independent view regarding approaches that might be taken to meet further challenges in cleaning America's air.

Six articles focus on efforts to curb contamination from the largest single air pollution source, motor vehicles. Included are features on assembly line testing of autos, car inspection and maintenance, EPA's campaign to discourage the substitution of leaded gas for unleaded fuel, and EPA's recent proposal to sharply reduce lead in gasoline. Another article reports on potential dangers to health from gasoline vapor and options to reduce the public's exposure to the fumes, and the sixth article discusses methanol, a cleaner, potential substitute for gasoline in cars.

Also in this issue, the Journal begins a series on major environmental problems being addressed by EPA's regional offices. Starting the series is a piece on EPA Region 1 initiatives in the expanding effort to clean up Boston Harbor.

Two regular features concerning activities at EPA—Update and Appointments— conclude this issue of the magazine. □

Haze over Chicago

United States
Environmental Protection
Agency

Office of
Public Affairs (A-107)
Washington DC 20460

Volume 10
Number 7
September 1984

EPA JOURNAL

EPA is charged by Congress to protect the nation's land, air, and water systems. Under a mandate of national environmental laws, the agency strives to formulate and implement actions which lead to a compatible balance between human activities and the ability of natural systems to support and nurture life.

The *EPA Journal* is published by the U.S. Environmental Protection Agency. The Administrator of EPA has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this agency. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget. Views expressed by authors do not necessarily reflect EPA policy. Contributions and inquiries should be addressed to the Editor (A-107), Waterside Mall, 401 M St., S.W., Washington, D.C. 20460. No permission necessary to reproduce contents except copyrighted photos and other materials.

Front Cover: Seagulls on a sunny day at Assateague Island, Maryland.

Photo credits: Tracey A. Finger; Allan Wilson; Greg Pease, Folio; California Department of Transportation; United Steelworkers of America; District of Columbia Department of Recreation; American Petroleum Institute; National Park Service.

Design credits: Robert Flanagan; Ron Farrah.

EPA JOURNAL Subscriptions

The annual rate for subscribers in the U S for the EPA Journal is $20 00 The charge to subscribers in foreign countries is $25 00 a year The price of a single copy of the Journal is $2 00 in this country and $2 50 if sent to a foreign country Prices include mail costs Subscriptions to EPA Journal as well as to other Federal Government magaz nes are handled only by the U S Government Printing Office Anyone wishing to subscribe to the Journal should fill in the form at right and enclose a check or money order payable to the Superintendent of Documents The requests should be mailed to Superintendent of Documents, GPO. Washington, D C 20402

Name-First, Last — Please Print

Company Name or Additional Address Line

Street Address

City | State | Zip Code

☐ Payment enclosed
(Make check payable to Superintendent of Documents)
☐ Charge to my Deposit Account No

The Nation's Air Cleanup

An Interview with Joseph A. Cannon

EPA Journal asked Joseph A. Cannon, the agency's Assistant Administrator for Air and Radiation, about the national air cleanup effort. The interview follows.

Q The Clean Air Act was passed almost 15 years ago. Has it led to real progress in cleaning up the nation's air?

A Definitely. Under the Clean Air Act, national ambient standards have been established for six major air pollutants. By almost any measure, air quality related to those pollutants has improved—in some cases dramatically—since 1970. Total annual emissions are down—particulates by 58 percent, sulfur oxides by 25 percent, carbon monoxide by 27 percent. These reductions in emissions have helped improve ambient air quality all across the country.

The fact that we have been able to reduce emissions and concentrations of criteria pollutants is especially remarkable considering our economic growth over the past decade. Since 1970, for example, we've reduced the carbon monoxide emitted by highway vehicles by 27 percent, even though we're driving about 50 percent more miles per year. Sulfur dioxide emitted by power plants has dropped about 10 percent since 1970, yet we've increased our coal-fired generating capacity by almost 60 percent.

In other words, we've not only improved air quality in absolute terms, we've done it in spite of the fact that our population and economy are growing, we're driving much more, and we're using more coal-fired electricity. Without the Clean Air Act, there is no doubt that air quality in the United States would be much, much worse today.

Q Does this mean we no longer have to be concerned about air quality in the U.S.?

A No. It simply means that we've done a good job controlling the sources and pollutants we thought were most threatening when the Clean Air Act was written. For example, the 1970 legislation specifically mandated control of power plants and automobiles, and our air quality today—especially in urban areas—reflects our success in doing that. Although some areas—like Los Angeles—still do not comply with national air quality standards, the number of those areas is diminishing.

On the other hand, we haven't done as good a job in coping with air quality problems that we don't understand as well. Hazardous air pollutants are the best example. The Clean Air Act told us to set emissions standards for hazardous air pollutants, and slowly but surely we're doing it. But defining "hazardous" has turned out to be much more complicated than we once thought. We can now measure chemical concentrations at extremely low levels, but it's not at all clear what chemicals are harmful to what degree at what levels.

At the same time, the public is very concerned about cancer. We've got to try to alleviate that concern by controlling those pollutants known to be hazardous to human health, and by educating the public about the scientific complexities and uncertainties we're faced with.

There are also a number of potential air pollution problems that weren't recognized then, or weren't considered serious then. Acid rain, indoor air pollution, and pollution from wood-burning stoves are three good examples. As we learn more about these kinds of air pollution, we may want to act. The point to remember is: air quality is a moving target. As one problem is solved, another one emerges. That's one reason the Clean Air Act should be amended periodically—not to weaken or strengthen it, but to make it more responsive to air quality problems as they are defined through the most up-to-date scientific data.

Joseph A. Cannon

Q What are the main goals you see for air cleanup over the remainder of the decade?

A In terms of the six criteria pollutants, we'll be looking at ozone and carbon monoxide—they are causing most of the non-attainment in the country. We're also going to continue to study the sources and effects of sulfur dioxide and nitrogen oxides in order to better understand the acid rain phenomenon. But by and large we are winning the battle with the so-called conventional pollutants.

In the future we'll also be studying hazardous air pollutants a lot more carefully and with a lot broader approach—where they come from, how they are emitted, who is exposed to them, how to best control them, and so on. We're finding that places like hazardous waste facilities are potential sources of hazardous air pollutants that need to be watched carefully.

So our two principal goals are to bring the country entirely into attainment of the health-based air quality standards, and to define and control hazardous air pollutants.

Q Can the public expect major changes in the nation's ambient air quality standards as a result of current EPA reviews? Which standards might be affected?

A One major change that we're looking at now is the standard for total suspended particulates. We've proposed that the current standard, which limits the concentration of all particles in ambient air, be changed to limit the concentration of only those particles smaller than 10 microns in diameter (PM_{10}). Health studies show that those smaller particles that can be breathed deeply into the lungs are much more dangerous to human health than larger particles. Because of these health considerations, we've proposed changing the TSP standard. As far as the rest of the ambient standards are concerned, we're expecting very minor, modest refinements—if any. I don't foresee any dramatic relaxations or tightenings.

Q What progress can we expect in the control of hazardous air pollutants?

A There was a long period—from the passage of the Clean Air Act until recently— when only four hazardous air pollutants were regulated. Early this summer, regulations were issued for benzene and we're now in the process of adding regulations for coke oven emissions, arsenic and radionuclides. But I think we should frankly recognize the main reason why so few substances have been listed under Section 112 since 1970. It is not due to any negligence or laziness on the part of EPA. Administrations of both parties have tried to do something, and all have come away frustrated. Our big problem is the statute itself and the inflexible character of the language Congress has given us to work with. Any standard the Administrator sets, for instance, has to provide "an ample margin of safety." It is not clear how we can establish this when we don't know the threshold of risk. In the long run, I think Congress is going to have to give us some clearer guidance on what we should be doing and how we should go about it.

Q You mentioned air pollution from wood-burning stoves as an emerging problem. How serious is that?

A In some parts of the country the smoke from woodstoves is a big part of local air quality problems. Wood smoke is contributing to excessive carbon monoxide and particulate levels in some non-attainment areas—cities like Medford, Ore.; Albuquerque, N.M.; Missoula, Mont.; and Reno, Nev. Those areas that don't meet the TSP standard because of wood smoke will have an even harder time meeting the new PM_{10} standard, because the particulates emitted by woodstoves are very small. There is evidence that people subject to high concentrations of wood smoke are suffering from some lung dysfunction. Some of the chemical constituents of woodsmoke are known tumor promoters. For these reasons I'm examining different ways that the EPA air office might respond to this relatively new problem.

Q You've recently started up a new air office with responsibility for encouraging air emissions trading. Do you expect this relatively new regulatory approach to help improve national air quality?

A In the short term, emissions trading does not necessarily improve air quality. The main goal of emissions trading is to achieve any given level of emissions control in the cheapest possible way.

The Clean Air Act takes a "command-and-control" approach to protecting air quality, and this approach has led to solid air quality improvements, some of which I mentioned earlier. But it also has had the unfortunate side effect of locking government and industry into an adversarial relationship. Emissions sources tend to fight the imposition of controls beforehand, and then drag their feet after the fact. They certainly have little incentive to do more than the law requires.

Emissions trading, on the other hand, gives industry an incentive not just to install the controls the law requires, but to invent new ones, to innovate, to use its wealth of engineering experience to go beyond the letter of the law. That incentive is money. We're trying to create a market in pollution control, so the

pollution that's cheapest to control is controlled first, the pollution that's most expensive to control is controlled last, and companies can make a profit by finding more efficient ways to control emissions. In effect, emissions trading tries to make plant engineers interested, involved players on the pollution control team.

Q Will air cleanup requirements lead to any further changes in automobiles?

A I don't see much dramatically new in the way of pollution control systems on cars. We've just proposed a big reduction in the amount of lead in leaded gasoline (see story on page 18), but I don't see a lot of change in the automobile itself. In the future, I think there will be a trend toward methanol as an automobile fuel, and that might result in some very minor modifications to automobile fuel systems.

Q Do you anticipate regulations to control the vapors that result from pumping gasoline at service stations?

A EPA published a study of this very problem in July. The study shows the costs and effectiveness of various ways of controlling refueling vapors. If we decide some kind of vapor control or recovery program is needed, then we need to determine whether the control should be on the pump or on the cars. However, we still haven't decided whether we need to control these vapors.

Q Do you think methanol is eventually going to be substituted for gasoline in American automobiles?

A The key word there is eventually...and when eventually is going to come. Many people—not just those interested in the environment—believe that we should replace diesel fuel and gasoline with methanol. In terms of energy use, methanol is more efficient than gasoline, it is clean burning, and it can be produced domestically from a number of sources such as natural gas, coal, and biomass. We should also keep in mind that we still meet about a third of our crude oil needs from abroad, a concern both from an economic and energy security standpoint. Consequently, within the agency we are trying to remove marketplace impediments to methanol use, and there is an Administration-wide effort at the Cabinet level to accomplish the same goal.

Q Are tampering and fuel-switching serious problems?

A Yes, they are. The results from our latest survey show that emissions controls on almost 26 percent of the fleet have been tampered with, and leaded gasoline is being used in about 14 percent of the vehicles designed to burn unleaded gas. Together, these problems are present in over one-third of 1975 and later model-year light vehicles.

Q What are you doing about it?

A We're approaching these prob ems from three directions. First, federal enforcement of the tampering and fuel-switching prohibitions is continuing. We currently have about 750 cases under active investigation. Many of them have been referred to EPA by state or local agencies that have been delegated inspection authority.

Second, people tamper with controls and fuel-switch primarily because they don't understand the function and operation of emissions control systems. They are trying to save money, but it's costing them more in the long run. Therefore, we have intensified our efforts to educate the public about tampering and fuel-switching. The national Clean Air Week campaign in May and the Car Care Month activities this coming October are two examples of the agency's efforts to better inform the public.

Third and most important, we are working closely with state and local governments to encourage them to implement vehicle inspection and maintenance programs that include checks for tampering and fuel-switching. Our long-term objective is to establish these programs in areas that do not meet, or barely meet, ambient air quality standards for hydrocarbons, carbon monoxide, and nitrogen oxides. At this time there are 14 active programs in the 65 potential implementation areas.

Yet as long as it's cheaper to buy leaded gasoline, there is going to be some misfueling. So one of the main objectives of our planned phase-down of lead is to try to eliminate that price differential so leaded gasoline costs about the same or maybe a little more than unleaded.

Q What are the other reasons EPA is speeding up its phase-down of leaded gas?

A For one thing, we know more now about the serious adverse health effects of lead, particularly in children. Second, the regulation we put out in 1982 just hasn't worked as well as we had hoped. Ambient lead levels have not dropped much, because people are misfueling more than we expected. So we took another look at the problem, and now we've proposed to accelerate the lead phase-down to better protect public health.

Q What exactly is EPA proposing to do?

A EPA has proposed sharp restrictions on the amount of lead that can be added to gasoline beginning January 1, 1986. At that time only 0.10 grams of lead per gallon of gasoline will be permitted. That's over a 90 percent reduction from current levels.

Q **Will this action solve both the fuel-switching and the health effects problems?**

A The 91 percent reduction in lead certainly should help with the health effects problem. As for fuel-switching, we know that at 0.10 grams per gallon, leaded gas is more expensive to produce than unleaded. If this cost differential is passed on at the pump, and unleaded gas costs less than leaded, one of the prime motivations for fuel-switching will disappear.

Q **Won't this rule cost industry a lot?**

A We estimate a cost of $575 million in 1986. While this may seem high, the benefits in terms of health, reduced pollution, and maintenance savings amount to $1.8 billion. So we have a net benefit of $1.2 billion. In fact, projected over several years, net benefits exceeded a billion dollars each year.

Q **Will this lead phase-down make older American cars and some of the European models obsolete?**

A No, there will be adequate supplies of leaded gas available beyond 1986. We only need about a tenth of a gram of lead per gallon for the lubrication needs of pre-1970 automobiles, heavy duty trucks, and some tractors. So for the foreseeable future we will have enough lead in gas for the cars that really need it because of their engine design.

EPA also is considering a total ban on leaded gasoline by 1995. By then we expect the development of alternative valve lubricants that are environmentally acceptable. They could be used by the vehicles still running on leaded gasoline.

Q **What would you say to motorists who are frustrated at the inconvenience of taking their cars in to have emissions control equipment inspected?**

A I would say that air pollution is a problem for many Americans, especially in the more populated areas where inspection and maintenance programs are required. But with just this minor inconvenience and slight frustration, you are helping clean the air that you and your neighbors breathe. Personally, I don't mind getting my car inspected, because I know we've got a big ozone problem on the eastern seaboard. It makes me feel like there is something I can do, as a citizen, to help achieve a cleaner environment. Besides, a car adjusted properly to pass emissions inspections will also run better and get better fuel economy.

Q **What do you feel are the critical issues Congress should address in reauthorizing the Clean Air Act?**

A We should take a fresh look at how to handle the deadlines required under the existing legislation. There ought to be some flexibility built into the legislation. We are going to have a hard time attaining standards in areas like Los Angeles, even with very strict, enforceable controls in place. Imposing arbitrary deadlines isn't going to change reality. I know Bill Ruckelshaus feels very strongly about this, too.

As I mentioned before, I'm sure Congress also will want to take a long look at Section 112 and devise a better way of handling hazardous air pollutants. The other thing we should be looking at is the way we protect air quality in pristine areas—the prevention of significant deterioration (PSD) program. Everybody—PSD opponents and supporters alike—admits that PSD as presently constituted is one of the most complicated regulatory programs ever devised by the mind of man. It doesn't have to be that complicated and cumbersome to protect clean air. We can get the kind of protection we need with a streamlined, simplified program, one that ordinary people can understand. I hope that Congress will look very carefully at ways to untangle this important program.

Q **Is there any other comment you would like to add?**

A Protecting air quality is a really tough job, make no mistake about it. It involves the accommodation of many vital, sometimes competing interests. It has cost billions of dollars already. But I think Americans should take great satisfaction and pride in the progress we have made so far. Everywhere I go I find a genuine, widespread feeling of commitment to air quality. That commitment has made past progress possible, and it is essential to future success.

I know there's a lot of emotion generated regarding Superfund sites, for instance, or indiscriminate use of pesticides, or contaminated water. But the fact is, we can pause to treat the wastes or purify the water. We can control the use of pesticides, or choose not to use them. But that's not the case with air: we have to breathe it as it comes to us. We don't have the luxury of pausing to purify it or not breathing until a crisis passes. Air is essential to life. That's why I think protecting air quality has to be the keystone in any program of environmental protection. Everyone has a stake in clean air. □

Reviewing the Acid Rain Issue

An Interview with William D. Ruckelshaus

William D. Ruckelshaus, EPA's Administrator, comments on the acid rain issue in the following interview:

Q Where do you see the national debate on acid rain heading in the next two years?

A I think it should be clear to everyone that public concern for acid rain is not going to go away. I am personally convinced that acid rain will continue to be a dominant environmental issue until we reach some form of national consensus on an appropriate course of action.

I do, however, see a change occurring in the thrust of this debate. Attention has begun to shift away from the causes and mechanisms that produce acid rain and is instead now focusing much more on the nature and extent of damages. In particular, I think more attention will be focused on whether the significant changes that have been observed in the growth and health of certain eastern U.S. forest species can be directly linked to acid rain or other related air pollutants. If, as some have suggested, acid rain significantly contributes to this phenomenon, it could fundamentally change our view of the scope of this problem. This, combined with the significant uncertainties and controversy regarding the scope and pace of acid rain damage to our lakes and streams, should provide the drive for a whole new round of debate.

Q Is EPA's near-term role in acid rain primarily limited to research?

A Absolutely not. Although an accelerated research program is a major part of EPA's efforts on acid rain, it is by no means our only involvement. The whole purpose of our research effort is to provide the facts and information needed to make good policy decisions as quickly as possible. To do this, we need not only an ongoing accelerated research program to fill the gaps in our scientific understanding, but in addition we need an ongoing program of policy development to be able to translate this information into policy alternatives. We can't afford to sit around with our hands in our pockets while waiting for new research results to arrive. Instead, we must begin to think now about the implications of new information in anticipation of its arrival.

This is why we have created an Acid Rain Policy Office within the Office of Air and Radiation. This office serves as the central coordinating office for all acid rain policy development within EPA and has the responsibility of working directly with the Acid Rain Research Program and other agency offices involved in related policy development. The OAR Acid Rain Policy Office, combined with the Office of Research and Development's participation in the interagency research effort, gives EPA a more integrated and comprehensive approach to this complex problem than we have had in the past.

Q Since the acid rain research program is spread over several agencies, how can we be sure that it will provide you and other decisionmakers the right information on a timely basis?

A I strongly believe that since we have chosen to defer a decision on the need for acid rain controls until we have a more adequate scientific understanding, it is imperative for us to make sure we're doing everthing we can to get this needed information as quickly as science will allow. I have become directly involved in addressing this concern by serving with the Secretary of Agriculture and the Director of the National Oceanic and Atmospheric Administration as co-chairs of the National Acid Precipitation Assessment Program (NAPAP), the interagency acid rain research effort. To support the need for coordinating the research program with policy development, we have recently created the Interagency Assessment Advisory Committee (IAAC).

A lake near Bangor, Maine. Last spring, EPA scientists collected samples from this lake and several others as part of the National Surface Water Survey. The agency is using the information to help determine the percentage of lakes in the country that are in danger from acid rain.

This committee is comprised of the leaders of the policy development staffs from the various federal agencies involved in acid rain and is chaired by Chuck Elkins, Director of EPA's Acid Rain Policy Office. IAAC is intended to provide to the interagency research effort a much more detailed and ongoing vehicle for identifying the scientific information needs of acid rain policy development than can be provided by relying on the co-chairs alone.

Q How long will we have to wait before you will have the information you need to make a decision?

A This is the one question I am asked most often. Unfortunately, it's one which I cannot directly answer, since I cannot predict with any confidence what the results from the research program will be or precisely when they will be forthcoming. It should be clear that it is not necessary to have complete or definitive answers for each area of uncertainty before we can develop new recommendations. As we continue to gain more knowledge and understanding about acid deposition, our ability to predict the results of various control efforts will increase, and we will reach a point at which we can reasonably make a decision regarding the need for additional controls. But I cannot tell you exactly when that point will come. What I have said before several Congressional committees is that I take it as an affirmative duty on my part as Administrator of EPA to assure that we make reassessment of our policy an active and ongoing process, and that I communicate the product of this effort to the key decisionmakers in the Administration and the Congress as soon as appropriate.

Let me add that, in the meantime, I think it's important that we do everything we can now to prepare for implementing a program of additional controls, should one be deemed necessary. This is why we've initiated an effort to identify and explore the implementation problems which would be associated with the kinds of control programs thus far proposed. This acid rain implementation project is also being managed by the Acid Rain Policy Office and includes the active involvement of the Office of Air Quality Planning and Standards (OAQPS), several regional air programs, the states through the State & Territorial Air Pollution Program Administrators (STAPPA) and and the Association of Local Air Pollution Control Officials (ALAPCO), as well as participation by industry and environmental groups. Congress has recognized the importance of our effort in implementation planning by providing an additional $3 million in state grant funds earmarked for this specific purpose in fiscal year 1985.

Seeking to Control Hazardous Air Pollutants

One of the major provisions of the Clean Air Act requires EPA to develop emission standards for hazardous air pollutants. As defined by Section 112 of the statute, a "hazardous air pollutant" is one "to which no ambient air quality standard is applicable and which in the judgment of the Administrator causes, or contributes to, air pollution which may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness."

In the nearly 15 years since Congress called for the identification and control of these hazardous substances, EPA has promulgated regulations for five pollutants under Section 112 (mercury, beryllium, asbestos, vinyl chloride and benzene) and is in the process of adding regulations for coke oven emissions, arsenic and radionuclides. Many observers, including members of Congress, environmentalists, and some EPA officials, have expressed concern that this regulatory pace is unreasonably slow. EPA has argued that its efforts to implement Section 112 have been impeded by several factors, not all of which are under EPA control.

A recent EPA analysis has helped to define the hazardous air pollutant problem more clearly and, in the process, has underscored some of the causes of EPA's regulatory difficulties. More important, the analysis takes the first step toward the development of a more effective program to control hazardous air pollutants in the future.

Problems in Section 112 Implementation

At the time Section 112 was written, Congress knew little about the potentially hazardous air pollutants that were being emitted by many different kinds of sources across the country. Congress did not know which pollutants posed what health risks, which sources were releasing what compounds, or how many people were exposed to which emissions. The statute simply ordered the EPA Administrator to list each pollutant that EPA intended to regulate, and then, within one year of listing, to set emission standards that protected the public health with an ample margin of safety. Section 112 did not direct the

Coke is pushed from a coke oven into a waiting quench car. Coke is used primarily in the steel industry's blast furnaces to make iron that is subsequently refined into steel. EPA wants to reduce coke oven emissions because it has been determined that they contain cancer-causing chemicals.

Administrator to consider costs or economic impacts in setting these standards.

An early study performed under contract to EPA evaluated more than 600 substances in terms of their production rates, volatility, and toxicity. Forty-three substances were culled from that list and recommended to the agency as priority chemicals for further evaluation. Since then, the agency has concentrated on about 37 substances from that list of 43, but it has also studied several other potentially hazardous air pollutants identified through other mechanisms.

In testimony last November before the Subcommittee on Oversight and Investigations of the House Committee on Energy and Commerce, EPA Administrator William Ruckelshaus outlined many of the problems agency officials have encountered in attempting to meet the requirements of Section 112. His testimony responded, in part, to an August 1983 General Accounting Office (GAO) report that acknowledged imperfections in the statute, but also sharply criticized EPA's implementation efforts. Taken together, the Ruckelshaus testimony and the GAO report highlight several reasons why the regulation of hazardous air pollutants has proven especially troublesome:

- There is often disagreement within the scientific community about the cancer-causing potential of many air pollutants. There are no clear requirements for the amount and quality of scientific evidence necessary to determine that a compound is carcinogenic.

- Scientific uncertainty is compounded by the fact that most health studies are based on high levels of exposure to a specific compound, whereas typical ambient exposures are much lower. Predicting low dose effects using information derived from health studies of high dose exposures is very uncertain.

- Section 112 requires that emission standards protect the public health with an "ample margin of safety." Current scientific opinion and EPA policy maintains that exposure to any level of a carcinogen poses some finite risk to human health, yet reducing emissions to zero would be very costly. The silence of Section 112 regarding EPA's authority to consider costs and economic impacts in setting emission standards has not helped in resolving this issue.

- Section 112 requires EPA to propose emission standards within six months of listing a substance as a hazardous air pollutant. EPA has never met this deadline, since setting an emissions standard requires not only adequate health data, but also a solid understanding of source categories, emissions, and control technologies. Collecting such information necessitates substantial time and resource expenditures.

- The Clean Air Act directs EPA to set "national emission standards" for hazardous air pollutants. Yet some pollutants may need to be regulated only in certain areas to protect public health. In other cases, a unique geographical control strategy may be the best approach in an area with a unique combination of hazardous air pollutants. Section 112 does not allow the kind of regulatory flexibility that a complex problem like hazardous air pollution seems to require.

EPA Strategy for the Future

Because of the increasingly apparent need for a comprehensive national strategy to address the hazardous air pollution issue, EPA decided to initiate a broad technical analysis of the problem. A study (popularly known as the "Six Month Study") was begun in late 1983 to examine the nature and extent of the air toxics problem in the United States, using existing data and standard EPA risk assessment techniques.

The recently completed study emphasizes four aspects of the problem that will be useful to policymakers who must eventually define the scope and direction of a national air toxics control program. First, the study characterizes the extent of the problem using quantitative estimates of cancer risk, i.e., annual incidence of cancer that may be linked to hazardous air pollutants, and estimates of lifetime individual risks. Second, the study defines the nature of the problem by identifying hazardous pollutants, the source categories that emit them, and their relative significance as public health risks. Third, since some portions of a strategy for regulating hazardous air pollutants may need to be site-specific, the study examines the geographic variability of the problem. Finally, the study evaluates existing data bases and identifies current gaps in knowledge.

Some of the study findings will be subject to debate, and specific numerical estimates may change as new data become available. Nevertheless, many of the conclusions from the study will serve the agency as a starting point for the development of a national hazardous air pollution strategy. Some of the more important findings are:

- Total national cancer incidence due to the 15-45 toxic air pollutants evaluated ranges from 1,300 to 2,000 per year.

- Maximum lifetime individual risk of cancer for persons living near major sources of nine pollutants studied is estimated at 1 in 1,000.

- Individual risks in some urban areas due to simultaneous exposure to several pollutants range from 1 in 1000 to 1 in 10,000. These risks do not appear to be related to specific point sources, but rather represent a portion of the total risks associated with the complex mixtures typical of urban ambient air.

- Air pollutants which appear to be the most important contributors to aggregate cancer incidence include: metals, especially chromium, arsenic, cadmium, and nickel; products of incomplete combustion; formaldehyde; benzene; and chlorinated organic compounds, especially chloroform, carbon tetrachloride, perchloroethylene, and trichloroethylene.

- No single source category dominates aggregate incidence in any of of the quantitative analyses. However, the study indicates that the following sources are important contributors: road vehicles, chemical production, solvent usage, gasoline marketing, waste oil burning, and metal manufacturing.

- Whereas ambient levels of some toxic pollutants vary widely from city to city, (sometimes differing by a factor of ten), the levels of other pollutants are more uniform from one city to the next. These findings indicate that reducing risks from air toxics will in part necessitate control programs sensitive to local circumstances.

The most important overall finding from a policy perspective may be that the air toxics problem is very diverse and therefore may not be adequately handled by the traditional solutions that focus on large point-sources. To fully explore the policy implications of the Six Month Study, a new EPA task force has been given the responsibility for drafting a national air toxics strategy by early 1985. The group will examine hazardous pollution control goals, outline federal, state, and local government roles, and study the effect that the national ambient air quality standards have in controlling air toxics.

These activities offer hope that EPA may soon have a much clearer idea of the risks posed by the pollutants Congress meant to control in Section 112 of the Clean Air Act. Moreover, they may lead to a more practical and effective regulatory program for managing those risks. □

The Supreme Court's "Bubble" Decision:

What It Means

by Michael H. Levin

On June 25 the U.S. Supreme Court unanimously affirmed the authority of EPA and states to let existing plants use a "bubble" to meet Clean Air Act requirements more quickly and inexpensively when those plants add new industrial processes or modernize existing ones.

By a vote of 6 to 0 the Court held such "modifications" need not be subject to the Act's most stringent requirements for new "emissions sources" if plant-wide pollution will not increase by significant amounts. Capping developments that began in 1979, the Court found that EPA and the 32 states that adopted this bubble approach for new modifications properly accommodated "the conflict between the economic interest in permitting capital improvements to continue and the environmental interest in improving air quality," in ways which "serve the environmental objectives as well."

The Justices' decision, *Chevron USA v. Natural Resources Defense Council,* had been awaited by EPA, state agencies, industry, and environmental groups since August 1982, when the court of appeals for the D.C. Circuit struck down the agency's "New Source Review" rule embodying this application of the "bubble." The "bubble" concept generally allows factories, refineries, and other sources of air pollution to treat all their stacks and vents as if they were enclosed by a giant bubble, trading extra pollution control on some stacks for reduced controls on others that are expensive to control.

A good example of benefits from the bubble approach is the DuPont Chemical Company's Chambers Works in Deepwater, New Jersey.
Although not directly involved in the Supreme Court case, the plant faced state requirements mandating 85 percent reduction of hydrocarbon emissions from 119 stacks, vents, and valves. Instead of controlling each of these emission sources to 85 percent, DuPont successfully applied for a bubble to control seven large stacks by over 99 percent. Because the large stacks were continuous emitters while the difficult-to-control vents and valves emitted only occasionally, the bubble secured 2,330 tons per year more reductions. It also saved DuPont $12 million in capital, plus several million dollars per year in operating expenses. And it produced faster compliance, since only seven stacks had to be controlled.

The Supreme Court's decision successfully concluded the first judicial test of the bubble in any context. It was hailed by EPA Assistant Administrator Joseph A. Cannon, who noted that bubbles allow firms to meet requirements "by using cheap reductions instead of costly ones... [They] can stretch pollution control dollars, and get faster compliance than if we required every auto plant or steel mill or print shop to do exactly the same thing... They speed environmental progress, with energy savings and less litigation."

"This decision encourages replacement of old, high-polluting facilities with new, clean, productive ones," added Deputy Administrator Alvin L. Alm. "It gives EPA and states more flexibility to focus on factory changes that could produce large increases in pollution, instead of requiring detailed review of thousands of changes that make little or no environmental difference... The Court seems to have given EPA more room to implement the Act creatively," Alm concluded. "We intend to use that authority responsibly, and to make sure that environmental progress is accelerated through its use."

The Decision

The decision may have broad effects. But the actual question before the Court was narrow: whether EPA could let states define "source" for New Source Review (NSR) purposes as either (1) a plant; or (2) any emitting piece of equipment within a plant. The first choice would allow bubbles. The second would preclude them, subjecting each modernization to very stringent, time-consuming New Source Review requirements, even if overall plant-wide emissions would not increase.

In August 1980, after long internal debate, EPA allowed such bubbles in clean air areas but prohibited them in areas that had not yet attained national air quality standards. In 1981 the agency changed its mind and extended the "plant-wide" option to nonattainment areas. EPA found that use of one definition was less confusing, that applying New Source Review to every in-plant change *retarded* environmental progress by discouraging replacement of old dirty processes with new cleaner ones, and that other requirements would continue to assure rapid attainment. EPA then included this approach as one of the four elements of its April 1982 Emissions Trading Policy: *bubbles* for existing plants, *offsets* to let new plants locate in nonattainment areas, *netting* (the plant-wide definition allowing modernized plants to use a bubble to

(Michael Levin is Chief of the Regulatory Reform Staff in EPA's Office of Policy, Planning and Evaluation. This article represents the author's views and should not be attributed to EPA or any other government entity.)

"net out of" New Source Review), and *banking* or storage of surplus reductions for later use.

The circuit court struck down this extension of "netting" to nonattainment areas, interpreting its prior decisions to ban use of such bubbles in nonattainment programs whose purpose was to improve air quality. The decision covered only "netting" bubbles for new in-plant modifications, but it suggested that *existing-source* bubbles in nonattainment areas might also be banned, though they often produce better progress than traditional regulation. (For example, by January, 1984, EPA and states had approved or were reviewing about 200 existing-source bubbles. These bubbles represent savings of more than $700 million over the cost of conventional, uniform emission limits. Nearly 70 percent of those approved or proposed for approval produced substantially greater emission reductions than conventional limits, with the rest producing equivalent reductions.)

The Supreme Court reversed the circuit court's decision, clearing the way for approval of numerous State Plans. The Justices first found that neither the Clean Air Act nor legislative debates addressed the bubble issue, but that Congress meant EPA to apply the Act's new source provisions "flexibly," and that EPA had proposed similar bubble rules in the past. They said EPA's rule was supported not only by persuasive reasons, but "by the public record developed in the rule-making process, as well as by certain private studies." And they concluded that use of the bubble "represents a reasonable accommodation of manifestly competing interests and is entitled to deference."

Some Implications

Predicting the impact of a Supreme Court decision is often like reading tea leaves. But some implications may already be clear.

One implication relates to what the decision does *not* do. It does not mean that new modifications can belch out pollution; such modifications will remain subject to federal New Source Performance Standards (NSPS) generally requiring more than 90 percent reductions, or to similar state requirements. Nor does it mean that air quality can be undermined by small emission increases from successive bubbles at different plants. The Court indicated that states which elect a plant-wide definition must also take steps to assure that rapid progress towards attainment continues.

Beyond this, the decision indicates that EPA is not required to squeeze every possible pound of pollution out of each new facility, when such efforts might be environmentally counterproductive. It endorses the bubble's use to achieve clean air, noting that "by giving a plant manager flexibility to find the places and processes within a plant that control emissions most cheaply, pollution control can be achieved more quickly." And for several reasons it seems likely to affect broader issues.

First, the statutory definition of "source" to which the Court referred appears in the Act's NSPS section. The Court concluded that this definition can "certainly ... connote an entire plant as opposed to its constituent parts" and that "the language itself implies a bubble concept." These findings could aid current EPA efforts to extend the bubble to new facilities subject to NSPS.

Second, the Justices repeatedly indicated that the lower court's prior decisions might also be erroneous. They noted that a 1976 NSPS bubble rule was still in force when Congress passed the 1977 Clean Air Act amendments. They implied Congress endorsed that bubble by not altering it. And they said the agency's 1980 rule allowing "modification" bubbles only in clean-air areas was not an independent policy decision, but the result of "the Court of Appeals that read the statute inflexibly." These statements suggest the Court would favor agency decisions applying the bubble in other contexts. In particular, they suggest that existing-source bubbles in nonattainment areas need not produce every conceivable improvement in air quality, so long as progress is secured. That suggestion could be important for EPA's final Emissions Trading Policy, as well as for use of bubbles to meet various requirements under the Clean Water Act.

Finally, the decision was written by Justice John Paul Stevens, one of the most respected legal minds on the Court. Whatever the ruling's implications, that fact and its precedent-setting nature should assure a ripple effect for years to come. □

The Clean Air Program: Options for the Future

by R. Shep Melnick

The Clean Air Act enacted in 1970 established the basic framework of the nation's clean air program. The Act expired in 1981, but has been temporarily extended without change as Congress considers its reauthorization with possible amendments.

EPA Journal *asked a respected student of the clean air program, R. Shep Melnick, for his thoughts about changes in the law. Dr. Melnick has done extensive research on the Clean Air Act and is the author of the book,* Regulation and the Courts: The Case of the Clean Air Act. *He is Associate Professor of Politics at Brandeis University and an associate staff member at the Brookings Institution. His views are not necessarily those of EPA. Dr. Melnick's article follows:*

For those concerned about the environment, 1985 will undoubtedly be the year of the Clean Air Act. When the 99th Congress takes office in January, it will have little choice but to return to the task of revising the Act, a task it has put off for too many years. In addition, the Supreme Court's recent decision upholding EPA's bubble policy that eases restrictions on new air pollution sources at existing plants *(Chevron v. NRDC)* makes clear that EPA has broad authority to experiment with new techniques for controlling air pollution (see story on page 10). For a brief period of time, the agency will have an extraordinary opportunity to exercise leadership in this policy.

Those who confront this task, though, face a dilemma. On the one hand, almost everyone familiar with the sprawling air pollution control program realizes that the most pressing need is to focus administrative, economic, and political resources on the most serious environmental problems. The Clean Air Act spreads EPA and the state agencies far too thin. The Act's procedural rigidities, its attempts to be comprehensive, and its apparent hostility to the balancing of environmental and non-environmental values makes it difficult for administrators to take scarce resources away from lesser problems in order to attack those discovered to be more serious. By making nearly everything a priority, the Act assures that nothing is.

On the other hand, those who are willing to offer leadership in the administrative and legislative processes—to announce and defend priorities which will inevitably make some people angry—must first come to terms with a program that is bewildering in its variety and complexity. There are so many items already on the legislative agenda, including acid rain, deadline extensions, toxic pollutants, streamlining the State Implementation Plan process, and extending the use of marketable emission rights, that there is a nearly overwhelming temptation to deal with each issue on an individual basis and to ignore the bigger picture. The byzantine nature of air pollution regulation makes even the stout-hearted despair at being able to articulate—to say nothing of putting into effect—a set of priorities for protecting our air resources.

Simplification, then, is both a crucial goal for those exercising leadership and a precondition for doing so effectively. How can one escape from this paradox?

The usual response is to identify simplification with eliminating "red tape." By reducing the number of forms and by consolidating permitting, we supposedly can create a less costly program which sacrifices no substantive goals. While such streamlining sometimes works, it is just as likely that procedural reform will bring more red tape rather than less. Real simplification requires deciding to abandon secondary goals, not trying to achieve all goals in a more efficient manner. Too often procedural reforms are used to hide rather than highlight our failure to decide what is most important.

To get a handle on the problem of simplification, it is necessary to ask why our air pollution control programs are so complex. Some complexities, alas, are beyond our control. Many are technical and scientific. For example, once a pollutant goes up, we're not sure where it comes down. So we must use computer models and argue at length about their accuracy. Nor are we sure what combination of pollutants is most damaging to human health or how reliable scrubbers will become during the next twenty years. The large number of sources of air pollution and the fact that many of them move around under their own power make the regulator's task monumental.

Added to this are the political and administrative intricacies of a regulatory program run jointly by federal, state, and local governments. Congress has declared that it wants uniformity and diversity, federal supervision without federal dictation. That elusive creature, "national policy," is contained in fifty-odd voluminous State Implementation Plans—modified by fifty-odd informal enforcement policies. This system, with all its advantages and aggravations, is a fact of life for those in pollution control. It is an added complexity that will not go away.

Another source of complexity is a series of subsidiary goals that were appended to air pollution programs in the 1970s. Some of these goals are laudable and command the loyalty of many dedicated officials in EPA and state agencies. The transportation planning sections of the Act seek above all to promote mass transit and discourage urban sprawl. In large part the Prevention of Significant Deterioration (PSD) section, designed to prevent degradation of the air in places where air quality is exceptionally good, is also aimed at stimulating land use planning and preventing rapid development of rural areas. Some sections of the Act have the effect—and a few even the intent—of protecting areas with established industry from competition.

A variety of interests have jumped aboard the Clean Air Act bandwagon. In general, those subsidiary projects that have been most successful (economic protectionism) are not commendable; those that are commendable (enhancing mass transit and encouraging land use planning) have not been successful. It is time to say that reducing air pollution is important enough not to be weighted down by these semi-submerged agendas.

Leadership in this direction will not come from Congress, which bears most responsibility for the problem. Nor will it come from environmental groups, which are seldom forced to confront the consequences of an overextended agenda. Only EPA has the incentive, the knowledge, and the prestige to recommend elimination of these appendages.

A final source of complexity is the lack of realism and forthrightness which for years has characterized the Act's most vocal supporters. The Act commands EPA to perform tasks that everyone familiar with pollution control knows cannot be done: meet ozone standards throughout the nation by 1987; set air quality standards without considering cost; accurately monitor and model tiny Prevention of Significant Deterioration

Smog over West Los Angeles, California in 1972

increments; establish dozens of new source performance standards within a few years—and defend them in minute detail; revise all State Implementation Plans within a matter of months, and make sure they are fully adequate to attain all air quality standards; and on and on. Rather than saying, "This is ridiculous," the agency has developed a myriad of coping mechanisms. It issues "conditional" State Implementation Plan approvals, bends on deadlines, agrees to "reasonable" compliance schedules, and accepts "good faith" efforts on nearly everything. Most glaringly, it considers the cost of attaining air quality standards while adamantly denying that it does so.

That the agency has avoided confrontation over these unreasonable demands is certainly understandable. For example, when EPA said in the early '70s that writing transportation control plans for cities like Los Angeles was silly, the courts responded, "Do it anyway!" Congress knew in 1977 that health effects thresholds are "myths," but reiterated their command to set "health only" standards. What is the point of trying to tell them again? In the short run, it is far easier to accept these commands on paper and to find ways to skirt them in practice.

But this strategy imposes many long-run costs. There is tremendous wasted effort: massive rewriting of State Implementation Plans that are halfheartedly enforced or revised by consent agreements; thousands of hours spent on analyzing standards that are never promulgated or revised; extensive tracking of tiny increments that seem arbitrary to everyone. There is damage to agency prestige: it takes only one private group with a good lawyer to force EPA to admit that it is not doing its job (which it cannot do since the job, or the combination of jobs, is undoable) and to rearrange public priorities. There is confusion, since no one ever really knows what agency policy is, whether it is the official pronouncement or a series of informal understandings which of necessity are not widely publicized. And finally, there is the cost of cynicism within the organization and among the public at large, which sees deadlines extended and rules bent without knowing why.

The goal of simplification requires a political strategy of frankness and education. The people who have studied the details of air pollution control for many years have taught us a great deal about which environmental problems are real and which are peripheral. They have devised a variety of techniques for attacking these problems. Bubbles, banking of emission rights, pollution taxes, environmental audits—all these merit attention and experimentation.

There is the danger, however, that these techniques will be sold as a cheaper way of providing everything Congress and the public want. Congress and the public want everything; we all want everything when we know little about costs and constraints. The challenge of leadership, then, is to convince Congress and the public that they cannot have everything they want, not because EPA is inept or corrupt or uncaring, but because there are limits to our knowledge and our resources. Only then will anyone listen to suggestions about what objectives are *most* important.

Those who put together the agency's legislative and rulemaking packages will perhaps find this advice lacking in usefulness because it is lacking in detail. They need program elements, which many people in academia are happy to supply. Many of the bright ideas of academics, unfortunately, seem much more clever in economics journals than in the *Federal Register*. It is the people who labor in the trenches of the bureaucracy who turn these clever ideas into useful routines. I know enough about EPA to have tremendous respect for its expertise, to appreciate the difficulty of the task, and to avoid overestimating the power of the musings of academic observers.

I have directed my comments to the macro rather than the micro level, to broad political themes rather than specific regulatory techniques, not just because I am a political scientist and thus know this area best, but primarily because this is where EPA has most seriously fallen down in the past. The cost of avoiding confrontation on air pollution issues over the past decade and a half is not only an overextended, inefficient program, but a program which is hard to understand and consequently hard to prune and to fortify effectively. All of us—politicians, administrators, judges, scholars, and citizens—have dug ourselves into a hole. Now we must somehow dig ourselves out. □

Cleaning Up Pollution from the Automobile

Motor vehicles are the largest single source of air pollution in the United States. EPA is working to control this problem in several ways — from testing car emissions on the assembly line to regulating lead in gasoline. The following articles explain these activities, as well as some related state and local actions.

Inspection and Maintenance: A Role for the Public

by Jane Armstrong

(Jane Armstrong is Project Manager of the I/M Group in EPA's Office of Mobile Sources. She has been a member of the group since its formation in 1978. She was initially assigned to help EPA's Region 5 office secure I/M legislation in the Midwest.)

Since the 1968 model year, all new cars have been designed to meet increasingly stringent pollution control requirements. Before it can be marketed, each car design is certified through laboratory testing to be capable of meeting required emissions limits for five years or 50,000 miles.

EPA studies in the early 1970s, however, discovered that within their first year on the road, half of the cars were already exceeding the pollution limits for which they were designed. The same discovery was made when vehicles with catalytic converters were put on the market beginning in 1975.

Further testing revealed that the problem wasn't due to inadequate EPA certification testing; it wasn't due to emission controls that failed as soon as the car left the dealership; it wasn't due to sloppy factory assembly. It was due to inadequate maintenance by the vehicle owner and in some instances to owners or their mechanics intentionally disabling emission control systems. Despite the large investment made in emission controls, the passenger car continued to be a major contributor to air quality problems in nearly every large urban area in the country.

The solution? Inspection and maintenance, or I/M — a state or locally run program which requires vehicle owners to periodically submit their cars for a short emission inspection. In the 1977 amendments to the Clean Air Act, Congress required that all cities with high carbon monoxide or ozone concentrations set up I/M programs. By 1979, 30 states and the District of Columbia were identified as having one or more urban areas needing the program.

It then became EPA's job to encourage these states to enact a program which one Arizona legislator compared to gun control in terms of controversy. For the first time, EPA was saying that individual consumers might be polluters and that they must personally bear the cost of cleanup.

EPA tried to encourage states to implement I/M programs by demonstrating their benefits in a testing station set up in Portland, Ore. Oregon, New Jersey, and Arizona had enacted I/M programs on faith, before there was a federal requirement, and before anyone had shown definitely that I/M would be effective in practice. Those states believed that the program was needed to help clean the air.

EPA's testing contractor borrowed cars from vehicle owners and found that, indeed, the short emission test taken while the car was idling could identify dirty cars. Even better, the study found that mechanics could improve the emission performance of dirty cars, at a cost averaging $22, through simple repairs like carburetor adjustments or replacement of air filters and spark plugs. Never before had mechanics been asked to make cars run not only better, but cleaner. Could they accomplish both goals? Yes, said the study. Three, six, and nine months after the I/M inspection, testing showed that these formerly dirty cars ran cleanly and performed well.

Once the Portland study had quantified the effect of I/M programs on vehicle emissions, it was necessary to establish whether cleaner-running cars would improve ambient air quality. EPA returned to Portland, and commissioned a study of carbon monoxide air quality for the years 1975, when Portland had begun its I/M program, through 1979. Based on the findings of this study, EPA concluded that an annual I/M program could reduce ambient carbon monoxide concentrations by 10 to 19 percent.

Armed with evidence that I/M worked, EPA staff spent the next five years testifying before state legislatures, reviewing State Implementation Plans, and overseeing the set-up of 41 state or locally run inspection programs across the country. EPA is still working with a few remaining states to implement I/M programs.

Each of the operating programs is unique. Some states license private garages to conduct inspections; some

At the Baltimore County vehicle emissions inspection station, a lane operator inserts a probe into a car's exhaust pipe. The probe is attached to a computer that analyzes the car's emissions

hire a contractor to build and staff centralized inspection lanes. Most measure hydrocarbons and carbon monoxide while the car is idling in neutral, but some measure emissions while the engine is under load, and others check to see that the emission control devices are hooked up properly.

Inevitably, there have been many battles associated with program start-up. Connecticut officials remember the first day of testing when intense public interest led to unmanageable lines at the centralized stations. Massachusetts officials had a harrowing day about two months into their program when most of the computerized emission analyzers mistakenly shut themselves down. But I/M programs have survived.

Demonstrations have been set up in shopping center parking lots to educate the public about I/M. The fear of the unknown that caused some people to oppose the program has been dispelled. Those of us who have worked with the demonstration van have experienced great satisfaction. When we arrive at the designated location and set up the emission analyzers and create the drive-through lanes, we wonder whether anyone will stop by for a free inspection. We are also a bit nervous that some people will stop to tell us just what they think of EPA and federal intervention in people's lives.

But after the first few cars come through, those worries disappear. Almost without exception we learn that people are concerned about the environment and that they are ready and willing to learn how their maintenance habits affect the amount of pollution their cars emit. During the day the same people will return with another family car to check its performance as well. And then there are those people whose cars fail the test and who return an hour or two later and pass, and say, "You were right, it only took a minor adjustment."

Tackling environmental problems isn't simple. It costs money and it requires a change in the way we manufacture, utilize, and dispose of the goods which are central to our lifestyle. But our experience in I/M is that, if people are asked to do their share, they will. □

Monitoring Auto Emissions Questions and Answers

What progress has there been in exhaust emissions control?

EPA has been monitoring exhaust emissions on new cars since its founding in 1970. By 1983 a 95 percent reduction in hydrocarbon and carbon monoxide emissions from new cars had been achieved. During the same period, a 75 percent reduction in nitrogen oxide emissions was also achieved.

When does EPA test motor vehicles?

EPA motor vehicle testing falls into three chronological phases: pre-production, production, and post-production. Pre-production testing "certifies" that cars have been designed to meet EPA emission standards before they roll off the assembly line. Assembly-line testing occurs as cars are being produced; it assures that cars in production are actually meeting the standards they were designed and certified to meet. Recall—or post-production—testing is performed on cars that have been in everyday use for several years and have accumulated substantial mileage. The purpose of recall testing is to assure that cars with a record of proper maintenance are still meeting EPA emission standards after years of daily use.

Who conducts EPA's motor-vehicle testing?

Pre-production certification testing is performed by EPA's Motor Vehicle Emission Laboratory in Ann Arbor, Michigan. Assembly-line Selective Enforcement Audits are conducted by auto manufacturers in the presence of EPA employees. Private laboratories under contract to EPA conduct post-production recall tests, as does EPA's Ann Arbor lab.

What types of tests does EPA run on cars?

EPA runs three basic tests: an evaporative emissions test that measures the gasoline vapors (hydrocarbons) that would be emitted by a vehicle parked for a length of time after operation; (2) an

exhaust emissions test designed to simulate normal city stop-and-go driving and used to measure both city emissions and fuel economy rates; and (3) a highway fuel economy test that measures the gas mileage a vehicle would get under highway driving conditions and speeds.

EPA's car tests are all performed under laboratory conditions so temperature and other factors can be controlled. Test vehicles are operated on a dynamometer, or treadmill, that permits a vehicle to "drive" while in place.

How much are exhaust emissions controls costing the American consumer?

According to EPA's Office of Mobile Sources, consumers have to pay between $250 and $425 for pollution-control devices designed to meet 1981 emission standards.

What gains have been made in fuel economy?

American automakers have, in general, been successful in meeting federal goals for the overall average miles per gallon (mpg) of their vehicles. Corporate Average Fuel Economy (CAFE) goals — set at 18 mpg in 1978 — have gone up in steady increments every year since then and will reach a new high of 27.5 mpg with the 1985 model year. Only in 1983, when sudden drops in gas prices increased the popularity of large cars, did Ford and General Motors fail to meet CAFE guidelines.

What changes in EPA's reporting of gas mileage averages are planned for the 1985 model year?

Starting with the 1985 model year, EPA and the U.S. Department of Energy will publish both the city and highway mpg figures determined by testing. Prior to the 1985 model year, the Gas Mileage Guide and mpg vehicle stickers listed only a single EPA figure based on an average of laboratory-determined mpg figures for city and highway driving. Now consumers will be better able to predict the gasoline consumption patterns of their new cars in the two primary driving situations they are likely to encounter. Moreover, the mileage figures themselves will be more realistic.

City figures will be adjusted downward 10 percent and highway figures downward 22 percent in an attempt to bridge the discrepancy between laboratory mileage figures and actual road performance.□

Driving Home Lessons about Fuel Switching

by Martha Casey and Jack Lewis

"Fuel switching" refers to the use of cheaper leaded gasoline in late-model cars designed to run on unleaded fuel. In cars built since 1975, catalytic converters remove pollutants from vehicle exhaust. But some American consumers pay mechanics to remove their catalytic converters so they can use cheaper and higher octane leaded gas. Others disable the converters by pumping leaded fuel into their cars through an improperly sized fuel nozzle or a damaged nozzle restrictor.

These drivers' short-term savings at the gas pump are more than cancelled out by long-term costs in the form of poorer engine performance, lower gas mileage, more expensive maintenance, and reduced resale value. Drivers seem to reason this way: "I need 20 gallons to fill my tank. Leaded regular costs seven cents less than unleaded regular. I'm going to save $1.40 today and every other day I fill up." These drivers are in for an unpleasant surprise. The Motor Vehicle Manufacturers Association estimates that for every seven cents saved, the fuel switcher winds up paying 26 cents to repair the damage caused by leaded gasoline. That adds up to a hefty 19 cents a gallon net loss every time a fuel switcher uses leaded fuel.

EPA currently estimates that lead damage to the emission-control system of a car can cost drivers between $155 and $530 in additional vehicle repairs. Other mechanical problems resulting from fuel switching can include fouled spark plugs, worn-out exhaust systems, degraded oil, fouled oxygen sensors, and rusted tailpipes and mufflers.

Fuel switchers are not only paying more in the long run by switching; they are also depriving the public of the pollution control investment that has been designed into their cars. The costs of fuel switching in terms of pollution are extremely high. EPA estimates that cars designed for unleaded fuel generate much more pollution when misfueled with leaded gas. When catalytic converters are removed or disabled, hydrocarbon, carbon monoxide, and nitrogen oxide emissions increase up to 800 percent. Furthermore, switching to leaded fuel also increases emissions of lead.

EPA's Office of Mobile Sources considers these emission increases a major health threat because of their known hazards. High blood lead levels have been linked to mental retardation and permanent nerve damage. Lower lead levels can cause behavior disorders. Hydrocarbons and carbon monoxide are known to cause respiratory illnesses, fatigue, and sensory impairment. Hydrocarbons also combine with nitrogen oxides in the presence of sunlight to raise ozone levels and produce smog. Excessive levels of ozone can cause shortness of breath and other breathing difficulties.

Charged with enforcing the Clean Air Act of 1970, EPA views pollution stemming from fuel switching as a major threat to urban air quality, which has been improving steadily since the introduction of catalytic converters and unleaded fuel in 1975. The Clean Air Act expressly prohibits removing catalytic converters, or rendering them inoperative. EPA has been bringing enforcement actions against gas-station owners, garage operators, car dealers, fleet-owners, and manufacturers suspected of removing catalytic converters. In addition, proposed amendments to the Clean Air Act reauthorization bill would make individual drivers liable for misfueling and engine tampering. The Senate Committee on Environment and Public Works has already approved these amendments.

In the past year alone, EPA has issued more than 500 citations for emission control tampering. In June 1984, for example, EPA proposed $426,000 in penalties against tamperers in Ohio and Texas as part of what EPA's Assistant Administrator for Air and Radiation,

(Martha Casey and Jack Lewis are on the staff of EPA's Office of Public Affairs, where Casey is a Press Officer and Lewis is Assistant Editor of the EPA Journal.)

EPA investigators found this pile of used catalytic converters during an inspection of a muffler repair shop. The converters had been improperly removed from autos.

Joseph Cannon, has described as "a national enforcement strategy to crack down on violators of the tampering and fuels regulations." EPA investigators discovered that the Copley, Ohio, police department was using an unleaded gasoline nozzle on a leaded pump to fuel its fleet of vehicles. Business violators in the vicinity of Copley included two gas stations cited for allowing cars requiring unleaded gasoline to be fueled from leaded pumps, and eight other businesses cited for selling leaded gas as unleaded. In Corpus Christi, Texas, EPA field inspectors, acting on an anonymous complaint, confirmed that a muffler shop was doing a thriving business removing catalytic converters. Twenty-two of the 24 altered vehicles were from fleets owned and operated by 14 different businesses.

In the anti-fuel switching effort, EPA's enforcement officials are cooperating with their state and local counterparts. Cannon praises this cooperation: "Support from the state and local air pollution agencies has been a great help in our efforts to put an end to violations of this sort. I encourage others to do the same."

Forty states have already passed laws that make it illegal for individuals to switch fuels or tamper with catalytic converters. There are currently 14 state or local authorities operating anti-fuel switching programs, most of which involve the annual inspection of a portion of the vehicle fleet. Many other programs are expected to be implemented in the next few years.

EPA's goal is to establish this type of program in all ozone, carbon monoxide, and nitrogen oxide nonattainment and marginal attainment areas. In fact, the agency operating guidance for fiscal years 1985 and 1986 lists the establishment of anti-fuel switching programs as one of the top five priorities of EPA's Office of Air and Radiation. The Office of Mobile Sources has been working through EPA's regional offices to assist state and local officials in implementing anti-fuel switching programs. EPA is providing training as well as technical and legal support. Also, State Implementation Plan credits are now available for those areas which implement vehicle inspection programs.

Unfortunately, fuel-switching abuses are so widespread that enforcement is expected to be difficult. Today leaded fuel constitutes 45 percent of all gas sales. Many pre-1975 vehicles are still on the road, and EPA estimates that as many as 13.5 percent of car owners with vehicles requiring unleaded gasoline now use leaded fuel on a regular basis. However, the 1982 EPA study from which this figure is derived probably underestimates real fuel-switching rates, because only voluntary participants were tested.

With many areas still in violation of Clean Air Act standards, EPA is dedicated to working closely with state and local officials to control the problem and to inform the general public. During the past year, EPA has also met extensively with representatives of environmental groups, public interest groups, the auto industry, and various segments of the automotive fuel marketing industry to discuss the problem. Ultimately, however, fuel switching is a problem that must be solved by individual drivers. If the promise of clean air for all Americans is not enough of an inducement, perhaps the realization that fuel-switching means money-wasting will persuade switchers to change their habits. □

Reducing Lead in Gasoline

by Bob Burke

"The capacity of lead to impair the physical and mental health of our children, particularly those who live in the inner city, has been well documented. Recently, additional evidence has come in showing that adverse health effects from lead exposure may occur at much lower levels than heretofore considered safe. The action we are proposing today will greatly reduce that threat."
— William D. Ruckelshaus

On July 30, EPA Administrator William D. Ruckelshaus proposed a set of regulations that will sharply reduce lead in gasoline and possibly result in a ban on all lead in gasoline at some future date. This proposal addresses two very troublesome environmental issues: the continuing human health threat from lead, and the adverse effects on air quality of using leaded gasoline in vehicles requiring unleaded gasoline — a practice which is called "fuel switching."

Specifically, EPA is proposing to reduce the amount of lead in gasoline by 91 percent from 1.10 grams of lead per gallon to 0.10 grams beginning January 1 1986. The agency is also considering a total ban on all lead in gasoline sometime in the mid-1990's.

An Overview of Lead Health Concerns

Lead has long been recognized as a hazardous substance. The toxic effects of lead at high levels are firmly established, and growing evidence suggests that lower levels, previously thought safe, may also pose particularly severe health

(Bob Burke is on the staff of EPA's Office of Public Affairs.)

A playground in Washington, D.C. EPA's proposal to reduce lead in gasoline would help protect children from the health hazards of lead.

risks for small children. But other studies are showing that fetuses are exposed to lead transmitted through the blood of pregnant women, and that adult health is vulnerable to lead exposure.

The dominant role of leaded gasoline in this troubling equation is abundantly clear. Leaded gasoline is responsible for about 80 percent of all lead emissions into the air, and there is a clear correlation between lead in gasoline and blood lead levels. EPA's proposal to reduce lead in gasoline will go to the heart of this matter by rapidly and systematically eliminating over 90 percent of lead emissions from gasoline.

The health threat of lead to young children remains the central concern. A few statistics put this into perspective. The measure of lead exposure is the concentration of lead in the blood measured in micrograms per deciliter (μg/dl). In the process of setting the current National Ambient Air Quality Standard for lead in 1978, EPA defined a blood lead level of 30 μg/dl as the maximum safe individual blood lead level for children. The list of demonstrated health effects of blood levels exceeding 30 μg/dl is well established.

Children with blood levels above 70 μg/dl suffer from highly visible disorders that range from life-threatening brain damage and persisting mental retardation to various kidney disorders, anorexia, severe abdominal pains, and vomiting. Children with lower blood lead levels have been found to have less obvious but nonetheless serious health problems. Significant nerve dysfunctions in the body, an impaired ability to formulate concepts, lower IQ, and altered behavior were found at lead levels of *40-60 μg/dl among preschool children.* Children with these levels were seven times more likely to repeat a grade in school or be referred to a school psychologist for behavioral problems. At even lower blood levels (between 30-40 μg/dl and below), reduced formation of red blood cells and interference in the transmission of nerve signals from the brain to the muscles have been noted.

Of growing concern in recent years is the capacity of lead to interfere with vitamin D metabolism in children. This interference has been found across a wide range of blood lead levels from 12-120 μg/dl and higher. Vitamin D is crucial for the metabolism of calcium and phosphorus, and for the normal growth and development of young children.

EPA's proposal to reduce lead in gasoline provides a real opportunity for protecting thousands of children from the health hazards of lead. In 1986 alone, approximately 97,000 children will have blood lead levels in excess of 30 μg/dl in the absence of the proposed regulations which Ruckelshaus announced on July 30.

The Problem of Fuel Switching

There are other environmentally harmful effects from leaded gasoline that are of equal concern to EPA. They involve the practice of fuel switching, which is pervasive and widespread. (See story on page 17.)

EPA's past programs to reduce lead in gasoline simply haven't worked as well as expected. In 1983, for example, the amount of lead used in refined gasoline exceeded the agency's estimates by a full 10 percent. EPA also found from a recent national survey that 13.5 percent of vehicles designed to run on unleaded gasoline had their emission control systems disabled by leaded gasoline.

Ruckelshaus recognized the pervasive nature of fuel switching when he announced his proposal to reduce lead in gasoline.

"Too many motorists and too many service stations are putting leaded gasoline where it doesn't belong — into the tanks of vehicles designed to run on unleaded gasoline."

Fuel switching disables catalytic converters and undermines federal and state programs to protect public health by reducing motor vehicle emissions. Exhaust emissions from a vehicle affected by fuel switching can go up by as much as 800 percent.

In view of the fact that even low-lead gasoline destroys catalytic converters, how will EPA's proposal reduce and hopefully eliminate fuel switching? The major impetus for fuel switching apparently involves the fact that leaded gasoline costs less than unleaded. EPA believes, however, that it will cost refiners slightly more to produce the new low-lead gasoline at 89 octane than to

produce unleaded regular gasoline at 87 octane. EPA is seeking comments on whether these additional costs of production will cause leaded gasoline to cost more than unleaded at the pump. If for some reason the new standard fails to achieve a dramatic reduction in fuel switching, EPA will consider even stronger measures, such as distribution controls, to restrict the use of leaded gas.

Older Vehicles

The owners of older automobiles requiring leaded gasoline as an engine protector will also be affected by this proposal. EPA has been deluged with inquiries from many of these owners who have heard from various sources that low lead gasoline won't be sufficient as a valve lubricant, particularly for some antique motor cars. In making this proposal, EPA felt confident of two issues crucial to owners of older vehicles, and to operators of farm machinery, outboard motor boats, and lawn mowers that currently use leaded gasoline. First, the agency is confident that low lead gasoline will serve as a sufficient engine protector for all the various vehicles and machinery that currently use leaded gasoline. Second, EPA is optimistic that an alternative valve lubricant will be developed for such vehicles and engines if all leaded gasoline vanishes from the marketplace at some future date. The agency is looking for information on environmentally safe alternatives to low levels of lead that could be made available as a valve lubricant.

Monetary Benefits

In the course of preparing this proposal, EPA estimated as precisely as possible the costs and benefits of the proposed regulations. It concluded that it is feasible for refiners to meet the reduced lead standards by 1986, and that it will cost them about $575 million to do so.

But this is more than offset by the $1.8 billion that will be saved in 1986 alone from lower health costs, reduced vehicle maintenance bills, and improved fuel efficiency. The net monetary benefits in 1987 and 1988 will also exceed $1 billion annually, according to agency estimates. [

Growing Concern about Gasoline Vapors

by Rita A. Calvan

What is an issue like "gasoline marketing" doing at a place like EPA? What does the marketing of gasoline—which appears to lend itself more comfortably to an economist's drawing of supply and demand curves than to the traditional role of EPA as environmental regulator—have to do with the mandate of this agency?

In fact, for some time now EPA has been considering what to do about the difficult problem of limiting health risks that may be associated with the distribution of gasoline from supplier, to retailer, to the individual automobile driver. For at one point or another in this distribution process, most Americans are exposed to potentially harmful vapors. The increasing tendency of Americans to save money by pumping their own gas has heightened concern over this source of airborne pollutants.

Gasoline Vapor Hazards and Control Options

Commercial gasoline sold in the United States contains a variety of substances thought to endanger human health. As the use of leaded gasoline declines, such constituents of leaded fuel as ethylene dibromide and ethylene dichloride will no longer be of concern as fuel additives. Nevertheless, any harmful effects from benzene and other, as yet largely unidentified, components of unleaded gasoline vapors will continue. Many of these unknown substances fall into a general class of pollutants called Volatile Organic Compounds (VOCs). This term covers a broad range of carbon-based substances that vaporize quickly under certain conditions of temperature and pressure. Even with the trend toward unleaded gasoline, the gasoline marketing system will continue to be a major source of emissions of VOCs, including benzene.

Some 280 million gallons of gasoline are distributed in the U.S. each day through an extensive network of storage, transportation, and dispensing facilities. Exposure to the vapors which escape during this process affects workers in the fuel production and transport industries, service station personnel, residents of communities located near these activities, and eventually, consumers.

Controls during all but the final phase of the gasoline distribution process — the fueling of vehicles—are commonly called *Stage I vapor recovery.* Such controls on vapors from bulk terminals, bulk plants, and the filling of underground storage tanks at service stations are currently in effect in most areas of the country that have not met EPA's National Ambient Air Quality Standards for ozone. (Ozone is an air pollutant created from the interaction of volatile organic compounds and nitrogen oxides in sunlight.)

Stage II vapor recovery controls are imposed at the retail pump with pump nozzles designed to prevent the escape of gasoline vapors as vehicles are fueled. These controls are now required in most of California and in the District of Columbia. In addition, seven other states have made commitments to use Stage II vapor recovery controls in conjunction with their efforts to meet ozone standards. However, actual implementation has been postponed to await results of EPA's ongoing evaluation of the gasoline marketing system.

Another method for preventing gasoline vapors from adversely affecting consumers and service station personnel is to equip automobiles and other vehicles with their own systems for capturing gasoline vapors. These so-called *onboard controls* include both vehicle fill pipe modifications and the addition of canisters to vehicles.

Current policy debate focuses on whether there is a need for additional protection from the effects of gasoline vapors and, if so, what kinds of regulations should be imposed. Several options for further controlling gasoline vapors could be considered if EPA should decide to propose new regulations. Five basic strategies which have been

(... ...alvan is on the staff of EPA's ... vernmental L...)

At this gas station in Anchorage, Alaska, pump nozzles prevent the escape of gasoline vapors.

identified are: (1) Stage I controls nationwide; (2) Stage II controls nationwide; (3) Stage II controls in ozone nonattainment areas only; (4) onboard controls nationwide; (5) onboard controls nationwide, plus Stage II controls in ozone nonattainment areas. Combinations of these strategies could be explored. Exemptions for service stations and bulk plants of certain sizes are also possible. Furthermore, Stage II vapor recovery could be a required interim measure while the vehicle fleet is gradually being equipped with onboard controls.

The Role of Benzene in the Debate Over Gasoline Vapors

Benzene was listed as a hazardous air pollutant under Section 112 of the Clean Air Act on June 8, 1977, a step which started a countdown toward regulation. By January 1981, the agency had identified five principal sources of benzene emissions and proposed standards for four of these, all in the petroleum and chemical industries. When no further action had been taken by the summer of 1983, two environmental groups, the Environmental Defense Fund and the Natural Resources Defense Council, filed suit in D.C. District Court. Additionally, the Chemical Manufacturers Association and several other industry groups filed a similar citizens' suit. These actions sought to force EPA to take final action on benzene, including the four sets of proposed standards, and on possible standards for coke oven by-product plants, the gasoline marketing system, and unspecified "chemical manufacturing plants."

With the suits still pending, on June 6, 1984, EPA promulgated final regulations for one benzene source category in the petroleum/chemical industries—fugitive emissions (pollutants which escape from other than their intended route, such as via a leak rather than through a smokestack). At the same time, the agency proposed regulations for coke oven by-product plants and withdrew the proposed standards for three other sources (maleic anhydride plants, ethylbenzene/styrene plants, and benzene storage facilities). Attorneys for the NRDC and EDF had already notified EPA prior to these regulatory actions of their intention to amend their earlier complaint by asking the Court to require a determination of the feasibility of onboard controls to contain gasoline vapors during vehicle refueling.

Health Effects of Gasoline Vapors Studied

As events in the benzene litigation would imply, the EPA has authority under the Clean Air Act to require control of gasoline vapors during vehicle refueling. Thus far the agency has made no decision on the need for, or nature of, such controls, because until very recently only limited reliable information on the health effects of these vapors was available. Recently, however, EPA completed and released for public comment an analysis of the risks versus costs of regulating vapors at the pump through either Stage II or onboard controls. This analysis was based in part on data on the health effects of gasoline vapors made available to the agency by the American Petroleum Institute (API).

The API studies—which have been submitted to the *Journal of the American College of Toxicology* for publication—were conducted over a period of two years. During the research, cohorts of rats and mice were exposed to varying doses of unleaded gasoline vapors. Significant increased tumor formation was noted in both types of animals, appearing in the livers of female mice and in the kidneys of male rats. Using the results of the API studies and developing unit risk factors applicable to humans, EPA estimated the public health risks associated with exposure to gasoline vapors. The results showed that exposure to gasoline vapors produced a substantially higher risk of cancer than exposure to benzene alone. Further, estimated cancer incidence was found to be considerably higher from exposure during self-service vehicle refueling than from community exposure through proximity to bulk terminals, bulk plants, and service stations.

Shortly before publicly releasing the analysis of gasoline vapor regulatory alternatives, EPA officials submitted a staff paper on the API and other relevant studies to the Environmental Health Committee of the agency's Science Advisory Board. This paper was considered at the Board's July 25 meeting in Washington, where there

appeared to be agreement with the EPA conclusion that unleaded gasoline should be considered a probable human carcinogen. However, some committee members expressed concern that the unit risk factor EPA had derived from the API studies was not suitable for estimating public health risk due to exposure to gasoline vapors. Among the limitations of the API data was the fact that the liver tumors found in the female mice are common in the species, even absent exposure to suspected carcinogens. Also, the gasoline used in the experiments was completely vaporized, exposing the animals to some heavier components of fuel which do not usually escape at the pump. Furthermore, proportions of the components in the test fuel were somewhat different from those commonly found in commercial unleaded fuel.

Issues Involved in Regulatory Decision-Making

Auto manufacturers believe onboard controls could cost as much as $50 per vehicle, and they generally oppose any steps that raise the prices of new cars. Gasoline retailers project that special bellows on gasoline pumps to capture vapors will be expensive to install and maintain. Thus, industry is pitted against industry, and both could face off against the environmental community, which may find the health effects data convincing evidence of the need to adopt controls.

Assuming no retrofit of existing vehicles, it would take more than ten years for a substantial portion of the U.S. fleet to be converted to vehicles with onboard controls. Conversion of the entire U.S. auto supply would take about twenty years. Stage II controls could be required as an interim measure, but the wisdom of such a move is subject to debate. States that have pledged to adopt Stage II vapor recovery and that have approved air quality attainment plans for ozone based on this commitment may be faced with their own dilemma, since it is not clear whether EPA can legally waive these requirements.

The issues involved in the gasoline marketing system as a source of hazardous air pollutants are typical of those faced in many areas of environmental regulation: scientific uncertainty, costs versus benefits, the relative effectiveness of various control technologies, and the comparative power of competing interests. Ultimately, of course, EPA must act in the most reasonable manner to protect public health and well-being. The question of whether to adopt a national program to curtail gasoline vapor emissions clearly will take additional time to answer. □

Methanol: The Fuel of the Future?

by Richard Wilson

During the early 1970s, Americans were jolted into awareness of two national environmental and energy issues. The first was the threat to air quality posed by pollution from motor vehicles. The second was the "energy crisis" of 1973-74, which led to gasoline shortages and subsequent increases in costs for all kinds of petroleum and petroleum products.

An extended national debate followed the 1973 oil embargo. More often than not, that debate was fashioned in terms of a choice between clean air and "energy sufficiency."

Fortunately, not everyone bought the notion that America would have to choose between a society where the environment was spoiled but everyone could drive their cars wherever and whenever they wished, and a society where cold homes and long lines at the gasoline pumps were necessary to protect the environment.

The Search for Alternative Fuels

America was dependent on foreign sources of petroleum, but wasn't short of energy. America's abundance of coal, natural gas, and various other products could produce alternative motor fuels. EPA, other federal agencies, and the private sector began to explore these possibilities.

There is no wonder fuel that can be produced economically and yet be relatively safe and environmentally clean. But methanol, a fuel derived from coal, natural gas, and other biomass sources, is very promising in several respects.

Over the last few years, EPA has learned much about methanol-fueled vehicles and engines. The agency has performed tests on a wide range of engines, including automobiles and large trucks that were modified to use pure methanol, and a diesel truck engine that uses a mixture of methanol and diesel fuel. At the same time, the agency closely followed other methanol research programs in the United States. From these testing programs, we learned a lot about the promise and problems of methanol.

Air quality benefits of methanol: The use of methanol in motor vehicles can produce significant environmental benefits compared to the conventional fuels used in most U.S. automobiles. EPA regulates three pollutants from gasoline-fueled vehicles: carbon monoxide, hydrocarbons, and nitrogen oxides. Current methanol-fueled vehicles emit about the same amount of carbon monoxide as gasoline vehicles but significantly lower levels of hydrocarbons and nitrogen oxides. Furthermore, methanol-fueled vehicles emit significantly lower levels of unburned hydrocarbons than do gasoline-powered vehicles. These hydrocarbons are the main ingredient in photochemical oxidants, or smog.

Los Angeles has always served as the most visible national example of air quality problems associated with smog from motor vehicle pollution. EPA researchers have estimated that completely substituting methanol for gasoline in that city would reduce peak ozone levels by 25 percent.

Methanol engines also produce smaller quantities of nitrogen oxides, a pollutant caused by incomplete fuel combustion. Nitrogen oxide emissions from current gasoline vehicles are already being reduced through the use of three-way catalytic converters. These converters would reduce emissions even more if methanol were used. Furthermore, methanol may give us some new choices about controlling nitrogen oxide emissions. It might be possible to reduce them significantly by using a simpler, less expensive catalyst and sharply increasing the use of methanol.

If methanol were substituted for diesel fuel in trucks and buses, dramatically improved air quality would be expected. Emissions of nitrogen oxides and particulates would be cut sharply, perhaps by as much as 50 percent.

(Richard Wilson is Director of EPA's Office of Mobile Sources.)

A methanol-fueled Ford Escort. Last year government agencies throughout California purchased 500 similar vehicles as part of a methanol fleet test program.

Methanol would also reduce sulfur emissions by about 2 percent annually.

Potential problems: The use of methanol will likely result in increased emissions of methanol and formaldehyde, compared to current catalyst-equipped gasoline-fueled vehicles. Would we be jumping from the frying pan into the fire by increasing these kinds of emissions as the price for reducing other pollutants emitted in greater quantities from gasoline-powered engines?

The answer to this question seems to be "no." EPA's preliminary calculations show that ambient methanol and formaldehyde levels would not pose a health problem except under highly unlikely circumstances, such as if all vehicles used methanol and 25 percent of them lacked effective emission controls.

Other environmental problems with methanol include evaporation of emissions from blended gasoline/methanol fuels, but these seem manageable if the fuels are mixed at carefully regulated levels. There are also health problems associated with drinking liquid methanol or absorbing it through the skin. Some people have mistaken liquid methanol for an alcoholic beverage; the consequences are often fatal. Direct methanol contact with the skin is also harmful. Prudence would dictate that every reasonable effort be made to avoid ingestion or prolonged skin contact in the manufacture, distribution, and use of methanol fuel products.

Finally, there are safety problems. The ignition of methanol vapors inside a fuel tank, the hazards of a large methanol spill, and the near-invisible flame of methanol fires are major concerns that require additional research.

Costs: Methanol is cheaper to produce than petroleum and it also is about 25 percent more efficient than gasoline. Methanol produced from natural gas may be sold for less than 60 cents a gallon; in the long run, it may be even less expensive to produce from coal, wood, or other biodegradable matter. The energy content of methanol is roughly half that of gasoline, so methanol already is competitive with gasoline. With readily available supplies of raw material for future production, methanol will likely cost less than petroleum-based transportation fuels.

The challenge: Our major challenge involves a commitment by the American automobile manufacturers and energy producers to shift resources to the production of methanol vehicles and fuels. EPA believes that automobile manufacturers will invest greater resources in methanol engine design as evidence grows that methanol is the fuel of the future. It may be possible to design an entirely methanol-burning engine instead of the gasoline-modified engines used in current testing. Such an engine would be more efficient and produce even lower emissions. EPA also believes that technology can be employed to successfully solve the health and safety problems related to methanol.

It will take a national commitment by government and the private sector to make methanol a viable alternative to petroleum. It's important to face this challenge now, instead of waiting for a new energy crisis to develop. □

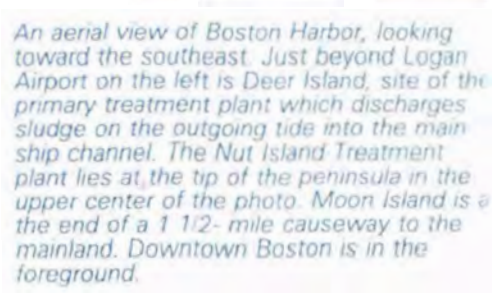
A Comeback for Boston Harbor?

by David Pickman

This is the first article in an EPA Journal series focusing on major environmental problems which EPA's regional offices are helping to solve. This article on Boston Harbor is by David Pickman, who is on the staff of the Office of Public Affairs in EPA's Region 1.

One of the largest, safest and most beautiful harbors in the world lies just to the north of Cape Cod, Massachusetts, sheltered by long peninsulas to the north and south and fed by three river basins. Miles of beaches, shellfish beds, marinas, docks, parks, ship repair yards and commercial and residential buildings line the shore. The Puritans founded the Towne of Boston here in 1632. Flounder and cod abounded in the sparkling water and clams in the mudflats. Deep channels and safe anchorages brought maritime trade exceeding that of New York, Philadelphia, or Baltimore until canals and railroads linked these cities with the interior in the early 19th century.

Our ancestors were more casual than we are about sanitation, and the pollution of Boston Harbor began early. The old Back Bay Fens and other tidal marshlands became saturated with sewage as the city grew. The Back Bay was gradually filled for residential development, but the problem of how to dispose of the sewage remained. In 1876 the Boston City Council passed an act to "lay and maintain a main sewer discharging at Moon Island in Boston Harbor." The purpose was to carry the sewage "out so far that its point of discharge will be remote from dwellings, and beyond the possibility of doing harm."



An aerial view of Boston Harbor, looking toward the southeast. Just beyond Logan Airport on the left is Deer Island, site of the primary treatment plant which discharges sludge on the outgoing tide into the main ship channel. The Nut Island Treatment plant lies at the tip of the peninsula in the upper center of the photo. Moon Island is at the end of a 1 1/2- mile causeway to the mainland. Downtown Boston is in the foreground.

No time was wasted in carrying out the Council mandate. Engineer Joseph P. Davis spent four months inspecting the sewers of Paris, London, and Berlin, and imparted his observations to his colleague, Eliot Clarke. The undertaking eventually cost $5 million and involved 30,000 feet of soil borings, about 50 million bricks from kilns in neighboring Somerville and distant Bangor, Maine, and 180,000 barrels of cement. Many sewers Clarke designed more than a century ago are still in use.

Soon after the sewer was completed, the Massachusetts General Court (Legislature) in 1889 established a Metropolitan Sewage District, comprised of 18 cities and towns. It was the first regional system of its kind in the country and soon expanded to the west, then to the north and south, until today there are 43 municipalities in the system — most of them in the basins of the Neponset, Charles, or Mystic Rivers. After World War II two deep rock sewer mains were built to Deer Island, the northern peninsula protecting Boston Harbor, and primary treatment plants were constructed at Nut Island in 1952 and Deer Island in 1968. As a result, there was a dramatic improvement in water quality, permitting the opening of six closed swimming beaches in Winthrop near Deer Island and the revival of commercial shell fishing in three nearby mudflats.

But the hard-won gains were transitory. The postwar population expansion, underfunding by the Legislature, poor maintenance, and the aging process all caught up with the system by the early 1970s. The $150 million investment in Deer and Nut Island treatment plants and attendant sewers and pumps brought only temporary benefits. Shell fishing today is sporadic or nonexistent and, while beaches remain open in Winthrop, they are often closed for long periods in summer on the southern side of the inner harbor. Primary sludge from both plants is discharged at Deer Island on the outgoing tide. A broad plume of discolored water can be seen from the air at any time of day. Both plants are heavily overtaxed with sewage. Not long ago the Smithsonian Institution wrote from Washington asking the sewage agency to contribute a century-old pump that the museum assumed was not in service any longer and could have only historical interest. The pump was still in use, answered the agency, but the Smithsonian's request would be kept on file.

The system is also plagued with overflows of storm water from combined sewers which carry both sanitary and storm flows to the treatment plants. At such times raw sewage bypasses both plants, "floatables" and all. There are 100 combined sewer overflows in the harbor. These and the malfunctioning treatment plants make the once revered Metropolitan District Commission (successor to the Sewage District) one of the worst polluters in the United States.

Since EPA began funding wastewater treatment projects in 1973, the agency has contributed $168 million in grants for Boston Harbor-related projects, mainly to repair and rehabilitate portions of the 7,225 miles of sewers and to correct combined sewer overflows in the 43-community system. Each of these dozens of grants has scored some gains or headed off even worse conditions in the harbor's receiving waters, but far greater capital investment will be needed to restore fishable, swimmable water quality. EPA Regional Administrator Michael R. Deland told a Massachusetts Legislative Committee recently, "The current sewage discharges...regularly cause beach closings, disease in fish and other organisms, and threaten the public health. They cannot be allowed to continue."

Deland was testifying in favor of legislation filed by Governor Michael Dukakis to set up a Metropolitan Water and Sewer Authority. The authority would have power to issue revenue bonds for the major capital expenses that lie ahead. Sewer use rates, which are lower than in most metro areas, will have to be increased to finance the necessary improvements, whether or not an authority is created. But the proposed authority would be in a strong position to raise up to $2 billion that may be required over the next decade or more to restore the water quality of the harbor.

EPA's Region 1 is moving on several fronts. This fall, the agency is expected to select among five siting plans for the construction of secondary treatment plants or for primary treatment with an outfall to carry primary effluent seven miles beyond the harbor mouth. Meanwhile, EPA is funding short term improvements to plants and corrections of combined sewer overflows at a cost of about $30 million. In July, Deland issued an administrative order to the MDC demanding a plan by which sludge, now discharged on the outgoing tide, will be managed in an environmentally acceptable manner. Sludge management studies have been going on for several years, and most of the research has been done on incineration, land disposal, composting and other methods.

Finally, EPA is acting as a friend of the court in a state suit by the City of Quincy against the MDC. Quincy lies on the southern rim of the harbor and suffers from the malfunctioning of the Nut Island plant and from overflows. The court appointed a master, Professor Charles Haar of Harvard Law School, who laid out a program of reform and self-discipline which is supervised by the court, EPA, and the Massachusetts Department of Environmental Quality Engineering. The court ordered MDC to take steps to raise sewer rates, reduce excessive flows which so often send raw sewage pouring into the inner harbor, upgrade and properly maintain its treatment plants, and take a careful look at financial needs and how to meet them

Much of what the court demanded, the proposed authority could do. It would have power to charge realistic sewer use rates, raise money in the private bond market, and hire adequate professional staff to execute the major projects that lie ahead. Further, the authority would hold a stronger hand in dealings with the 43 cities and towns, many of which are lax in adopting or enforcing sewer use laws. Illegal connections of drain spouts and sump pump hoses alone account for a major portion of the monstrous overflows that carry raw sewage into the harbor.

Who will be the beneficiaries of a cleaner harbor? The clam diggers, the sailors and swimmers, the commercial and sports fishermen, the shipping industry, and the tourists (who occasionally write to Boston newspapers from distant home towns about the "floatables" they saw from a Boston Harbor excursion boat). This summer the excursion boats plied the murky harbor waters, their loudspeakers blaring historical spiels and descriptions of shoreline features and other vessels in the endless parade of freighters, tankers, yachts, and naval or Coast Guard vessels Nothing is said about the filth. Nothing needs to be said. But the pressure is building. Wheels are beginning to turn.

More than a century after the first trunk sewers were laid, Boston Harbor's prospects are looking up.

One of these days, the Smithsonian curators may even get that ancient pump they are looking for. □

New Appointments and Awards

John C. Chamberlin

Dr. Rosemarie C. Russo

Administrator William Ruckelshaus has appointed five employees to new positions at EPA. The new appointments include a Director of the Office of Administration, an Environmental Research Laboratory Director, and a Regional Counsel. Two appointments in the Office of Solid Waste and Emergency Response give OSWER new directors for its Emergency Response and Permits and State Programs Divisions.

Also, two executives were assigned to new posts in the Office of Air and Radiation.

In addition, five EPA employees have been singled out for special recognition by outside organizations. One has been named Federal Employee of the Year in the Professional/Scientific Category. Another has been appointed to a one-year term as President of the Air Pollution Control Association (APCA). The remaining three are EPA scientists honored for their outstanding research contributions.

John C. Chamberlin has been named Director of EPA's Office of Administration. In his previous role as Deputy Comptroller of EPA, he managed the planning and budgeting processes of the agency from 1980 to 1984.

In 1981, Chamberlin was sent by the World Bank to Peru to begin the design of a new planning and budgeting system for the Government of Peru. Prior to 1980, Chamberlin was branch chief of the Budget Review and Analysis Branch, and the Enforcement Branch of EPA's Office of the Comptroller, chief budget officer for the North Africa, Near East, Asia and Pacific region of the Peace Corps, program analyst in the Office of Economic Opportunity, and an industrial engineer at IBM.

Immediately after graduating from Virginia Polytechnic Institute in 1965 with a B.S. in Industrial Engineering, Chamberlin joined the Peace Corps and served for two years in Peru. He worked briefly as an instructor at the Stanford University Business School prior to earning an M.B.A. from the University of Pittsburgh in 1968.

Dr. Rosemarie C. Russo has been appointed director of EPA's Environmental Research Laboratory in Athens, Georgia. She joined the agency in 1982 as associate director for research operations at EPA's Environmental Research Laboratory in Duluth, Minnesota. For four years prior to that she was on an Intergovernmental Personnel Act (IPA) assignment to the Duluth laboratory as a research chemist while remaining on the faculty of Montana State University.

Dr. Russo began work at Montana State in 1972 as a research associate in the Department of Chemistry. By the time she left, she had risen to the position of Adjunct Professor of Chemistry and Associate Director of the Fisheries Bioassay Laboratory.

Dr. Russo received her Ph.D. in inorganic chemistry from the University of New Hampshire in 1972. She was an assistant professor of chemistry at Gettysburg College for one year before accepting a research position at Montana State. She earned her bachelor of science degree in chemistry at the University of Minnesota, where she graduated in 1964.

Dr. Russo is the author of numerous research journal articles and other publications.

Patrick A. Parenteau has been named Regional Counsel for EPA's Region 1 in Boston. Parenteau has joined EPA after eight years with the National Wildlife Federation, where his most recent position was vice president in charge of resources conservation.

After graduating from Regis College in 1969 with a bachelor of science degree in business, Parenteau completed his J.D. at Creighton University in 1972 and his L.L.M. at George Washington University in 1975.

Parenteau began his legal career with the Legal Aid Society of Omaha, where he worked from 1972 to 1974. He taught for a year at the Northwestern School of Law after completing his L.L.M. at George Washington. From Northwestern Parenteau went to the National Wildlife Federation in 1976.

A member of the American Bar Association and the District of Columbia and the State of Nebraska Bars, Parenteau has published numerous articles and delivered many speeches on various aspects of environmental law.

John J. Stanton has been named Director of the Emergency Response Division of EPA's Office of Solid Waste and Emergency Response (OSWER). Since November 1983 Stanton has been serving as a group leader of an OSWER task force created to assess the reauthorization of Superfund.

From 1979 to 1983 Stanton worked for the New Jersey Department of Environmental Protection on an intergovernmental assignment from EPA. During his first three years in New Jersey, he served as Deputy Director and Director of the state's Division of Environmental Quality. During his final year in the state, Stanton served as Director of the New Jersey Division of Waste Management.

In 1978 and 1979 Stanton was a Deputy Division Director in the Office of Resources Management at EPA headquarters. From 1976 until 1978 he served as Chief of the Program Assessment Branch in the agency's Program Reporting Division.

From 1971 to 1976 Stanton worked in EPA's Region 2 in New York City. First he served as a civil and sanitary engineer. From 1972 to 1974 Stanton was Region 2's Chief of Basin Planning. Between 1974 and 1976 he was Chief of the Region 2 Planning and Evaluation Branch, Management Division.

A Navy veteran, Stanton has also worked as a civil engineer for the City of San Diego.

Patrick A. Parenteau | John J. Stanton | Bruce R. Weddle | Dr. William L. Budde | Joseph Padgett





Stanton received his bachelor of science in civil engineering from the Newark College of Engineering in 1966. Stanford University awarded him a master of science in civil engineering degree in 1971. Stanton earned an M.B.A. from Adelphi University in 1975.

Bruce R. Weddle has been appointed Director of the Permits and State Programs Division in EPA's headquarters Office of Solid Waste and Emergency Response (OSWER). He has been Acting Director of the division since July 1982. Weddle served as Deputy Director of the Permits and State Programs Division between 1979 and 1982.

Weddle came to EPA in 1972 from the Bureau of Solid Waste Management of the Public Health Service. Between 1972 and 1973 he served as a supervisory industrial engineer in EPA's Office of Solid Waste in Cincinnati, Ohio. In 1973 Weddle came to EPA headquarters where he spent his first year as an acting branch chief in the Office of Solid Waste. Between 1974 and 1979 he was the branch chief responsible for managing OSWER's national programs covering industrial wastes and municipal sludge management.

In 1968 Weddle graduated from Clarkson College with a bachelor of science degree in mechanical engineering. He worked as an applications engineer for Allis-Chalmers from 1968 until 1970 when he joined the Public Health Service's Cincinnati Bureau of Solid Waste Management. Weddle received an M.B.A. from Xavier University while he was working in Cincinnati.

In 1977 Weddle was awarded EPA's Bronze Medal for meritorious service to the agency. He won the agency's Silver Medal in 1979.

Glen L. Sjoblom, director of EPA's Office of Radiation Programs, has been selected to oversee international activities in the agency's Office of Air and Radiation. One of Sjoblom's first assignments will be to represent the U.S. at the International Atomic Energy Agency meeting in Vienna this September. A career federal nuclear engineer, he has headed the agency's radiation programs for the past two years.

Sheldon Meyers, also an engineer and currently Deputy Assistant Administrator for Air and Radiation, has been selected to replace Sjoblom as head of the Office of Radiation Programs.

Meyers, who has held several program positions in EPA, formerly directed EPA's Office of Federal Activities, the Office of Solid Waste and the Office of Air Quality Planning and Standards. He also directed the National Nuclear Waste Management Program at the Department of Energy.

EPA's **Dr. William L. Budde** has been named Federal Employee of the Year in the Professional/Scientific Category. He received his award in June at the annual Federal Executive Board/Federal Business Association's awards ceremony in Cincinnati.

Dr. Budde works at EPA's Environmental Monitoring and Support Laboratory in Cincinnati, where he is chief of the Advanced Instrumentation Section, Physical and Chemical Methods Branch.

Through Dr. Budde's efforts EPA's Gas Chromatography-Mass Spectrometry (GC-MS) analytical program has proved to be an enormous success both within EPA and throughout the environmental and regulated communities. He has also organized the GC-MS Users Group which provides a forum for the transfer of information and experiences by GC-MS analysts everywhere. In addition, Dr. Budde has become a national and international leader in the field of automated data acquisitions.

The American Water Works Association honored three EPA employees at its Annual Conference and Exposition in Dallas, Texas, on June 11, 1984.

Edwin E. Geldreich, who is chief of the Microbiological Treatment Branch at EPA's Municipal Environmental Research Laboratory in Cincinnati, received the AWWA's Alvin Percy Award for a lifetime of research contributions to water science and water utility practices.

O. Thomas Love, Jr., and **Richard G. Eilers**, also of EPA's Municipal Environmental Research Laboratory in Cincinnati, were awarded the AWWA Publications Award for their paper "Treatment of Drinking Water Containing Trichloroethylene and Related Industrial Solvents."

Joseph Padgett has begun a one-year term as President of the Air Pollution Control Association (APCA). He is the first EPA official to be elected to the office in APCA's history. Formerly the director of the Strategies and Air Standards Division of EPA, Padgett is now on an IPA assignment from EPA to the State of North Carolina Division of Environmental Management.

APCA is a technical and educational association devoted to furthering the art and science of air pollution control. Its membership is comprised of air pollution control professionals in all sectors of industry, science, government, academia, research, and consultant organizations in 48 countries. □

Update

A review of recent major EPA activities and development in the pollution control areas.

AIR

Misfueling Violations

EPA has cited two companies, one in Oregon and one in Colorado, for misfueling violations.

Louisiana-Pacific Company, a major pulp and paper producer, has been cited by EPA for violations of the Clean Air Act. Charges in a notice of violation issued to the firm's home office in Portland, Ore., allege that 25 of 56 company vehicles requiring unleaded fuel were misfueled with leaded gasoline from a company gas pump at its Red Bluff, Calif., facility. The agency is proposing that Louisiana-Pacific pay $182,650 in penalties for the alleged violations.

EPA said the enforcement action was taken as a result of an investigation initiated last October after the agency received information from the San Francisco Bay Chapter of the Sierra Club.

In a separate action, EPA has proposed fining Northern Armored Service of Greeley, Colo., $77,650 for illegally fueling 10 vehicles and for failing to equip one leaded gasoline pump with the proper nozzle.

ENFORCEMENT

New Enforcement Activities

In recent ceremonies in seven cities across the country, 23 criminal investigators from EPA were sworn in as Special Deputy United States Marshals.

For the first time, EPA investigators will be authorized to make arrests, to execute search warrants and court orders, and to carry firearms in the course of investigating federal environmental crimes.

The Justice Department has granted the law enforcement powers to EPA investigators for an interim 90-day period. The trial period will be used to determine what investigative resources will be necessary to support the long-range program.

The 23 investigators are assigned to the Office of Criminal Investigations within EPA's National Enforcement Investigations Center (NEIC), headquartered in Denver, Colo. Investigators are also stationed in Atlanta, Seattle, Chicago, New York, and Washington, D.C.

State Enforcement Guidance

EPA enforcement guidance with recommended time periods for taking action has been sent to EPA's 10 regional offices to be used in establishing state enforcement agreements.

The guidance covers air, water, hazardous waste, and pesticide programs. It will serve as the basis for enforcement agreements the agency hopes to reach with all states by October.

The agreements will identify state performance expectations and the standards EPA will use to evaluate state performance, determine which violations will require penalties or equivalent sanctions, indicate when EPA will step in and take federal enforcement action, and establish time frames for initiating and escalating enforcement action against significant violators.

The guidance defines EPA's expectations for state performance. State performance will be assessed in terms of how well the state is identifying violators and getting them to comply with EPA standards through the use of an up-to-date list of significant violators, established time frames for taking enforcement actions, and the use of well-defined compliance measures once an enforcement action has been taken.

Discretionary Listing

As part of a stepped-up enforcement program, EPA has proposed revised regulations to streamline the process for withholding government contracts, grants, or loans from facilities that violate the Clean Air and Water Acts.

The proposed revisions would expand the opportunities for "discretionary listing" of facilities guilty of chronic civil noncompliance with clean air or water standards. Listing, commonly referred to as "contractor listing," means being placed on a "List of Violating Facilities." Being listed renders a facility ineligible for contracts, grants, or loans over $100,000 from any federal agency.

Under EPA's proposal, a broader range of civil enforcement actions under both the Clean Air and Water Acts can now provide the basis for discretionary listing action. Discretionary listing could be initiated by a recommendation from a federal or state official or private individual, but certain formal proceedings, including a hearing, must take place before listing occurs.

HAZARDOUS WASTE

Love Canal Ruling

Administrator William D. Ruckelshaus has denied, for the time being, a request for EPA to purchase rental and non-residential property in the Love Canal area of Niagara Falls, N. Y.

In a letter sent August 2 to Rep. John J. LaFalce (D.-N.Y.), Ruckelshaus emphasized that the federal Superfund law will continue to be used primarily to protect human health and the environment rather than for purchasing property which has suffered diminished value due to its proximity to abandoned hazardous waste sites.

Ruckelshaus denied a request by LaFalce that EPA purchase a number of rental homes, commercial properties, community facilities, and vacant lots located within the Emergency Declaration Area (EDA) surrounding the Love Canal Superfund site in Niagara Falls, N. Y. He promised to reconsider the decision at a later date if ongoing habitation studies at Love Canal indicate that it would be unsafe to repopulate the area in the future. Those studies will be completed over the next several years.

RCRA Agreement

Secretary of Energy Don Hodel and EPA Administrator Ruckelshaus agreed on August 1 to implement a joint program for applying the Resource Conservation and Recovery Act (RCRA) to facilities owned by the Department of Energy and operated under the Atomic Energy Act (AEA).

The agreement announced by Secretary Hodel and Administrator Ruckelshaus is designed to ensure continued aggressive implementation of RCRA to protect public health and the environment, and to define precisely those instances when application of RCRA to energy facilities would be inconsistent with the Atomic Energy Act.

New RCRA Permits Procedure

Procedures for granting permits for above-ground hazardous waste storage facilities under the Resource Conservation and Recovery Act (RCRA) would be simplified and made less costly under a new EPA proposal to create RCRA class permits.

EPA estimates the proposed rule could save an average of $11,000 per facility in paperwork costs, for a total savings of as much as $18 million for all the facilities nationwide, with no relaxation of RCRA's technical standards.

Under the new procedures, EPA would group hazardous waste facilities by class. For example, the agency would identify waste facilities with only above-ground tanks or containers and group them into one class. Instead of requiring each of these facilities to develop detailed RCRA permit application packages, the new permit procedures would require them only to complete a simple standard form applying specifically to their class.

EPA will encourage, but not require, the states to incorporate the proposed permit application form into their authorized RCRA programs. The public will still have the opportunity to comment on permit applications as it does under the present system.

Mississippi Waste Program

Mississippi has become the second state to receive final authorization to operate its own hazardous waste program. EPA will continue to furnish federal grant monies, but the state began issuing its own permits effective June 27, 1984. It will also oversee the sites based on RCRA rules. The only other state with operational authority is Delaware.

PESTICIDES

Aldicarb Review

EPA has initiated a special review of the pesticide aldicarb after determining that continued use of this product may result in an unreasonable risk to public health. The agency based its decision on evidence that aldicarb, which has the trade name Temik, has led to contamination of ground water in some states. During the special review, the risks of aldicarb will be carefully examined and a determination will be made whether such risks are unreasonable in the light of known benefits of the product.

Aldicarb is a granular pesticide used to control root worms, mites, and insects in soil. It is currently registered for use on dried beans, cotton, grapefruit, lemons, oranges, peanuts, pecans, potatoes, sorghum, sugar beets, sugar cane, sweet potatoes, and ornamentals. First registered in 1970, aldicarb is one of the high-volume pesticides EPA is now reviewing on an accelerated basis.

Animal tests show the product to be highly toxic in contact with the skin, when inhaled, or when ingested orally. However, according to a large range of valid test data reviewed to date, neither aldicarb nor its metabolites have been shown to be carcinogens, mutagens, or teratogens.

Daminozide Review

EPA has initiated a special review of daminozide, a pesticide used primarily on apples and peanuts, after determining that continued use of this product may result in an unreasonable risk to public health.

Daminozide, which has the trade name Alar, has caused tumors in multiple organs of male and female mice and rats. It is contaminated with and breaks down into unsymmetrical, 1, 1-dimethylhydrazine (UDMH), a known carcinogen.

The agency is concerned about the long-term chronic effects of this pesticide and UDMH. The lifetime dietary risks from residues on both raw and processed foods may be high. EPA does not feel, however, that the additional 18 months needed to reach a final decision on this product will cause significant problems.

To reduce exposure to field workers while the review is going on, the agency has set a minimum time period of 24 hours before workers can re-enter a field after it has been treated with daminozide.

TOXICS

National Dioxin Study

A two-year, $7.4 million national study to investigate sites that might be contaminated with low levels of dioxin began this summer.

The study is another phase of a national strategy EPA issued last December in response to public concern about the potential health effects of dioxin.

The first component of the strategy—investigation of sites most likely to be contaminated—is well underway. This includes the categories (tiers) 1 and 2 where the pesticide 2,4,5-TCP was produced or used to make certain other pesticide products, or where wastes from their production were disposed of. EPA believes 80 or 90 percent of the dioxin in the environment is located at such sites.

WATER

Michigan Permit Authority

Michigan has become the first state in the nation to receive federal authority to administer and enforce its own dredge and fill program under the Clean Water Act.

EPA announced on August 3 that Michigan's request to administer and enforce the Act's Section 404 permit program had been approved by EPA Region 5 Administrator Valdas V. Adamkus.

Under the 404 program, all persons proposing to discharge dredged or fill materials into the waters of the United States must obtain a permit. Permits are issued by the U.S. Army Corps of Engineers, which evaluates requests based on criteria prepared by EPA in conjunction with the Army. Failure of dischargers to abide by permit requirements can result in stiff civil or criminal penalties. The Act allows and encourages states to manage their own 404 permit programs with EPA approval, under an amendment passed in 1977. With this approval, Michigan becomes the first state with authority to issue permits for all discharges of dredged and fill material affecting many state waterways, including wetlands. The exceptions are navigable waterways and those waters that could reasonably become navigable. These by law must remain under Corps of Engineers control.

Enjoying the scenery on a clear day at Bearfence Mountain in Shenandoah National Park in Virginia.

Back cover: The Grand Canyon area in Arizona. On the clearest days, visibility in some parts of the Southwestern U.S. can approach 200 miles.

AGENCYWIDE

Minority Business

A Memorandum of Understanding was signed on July 11 by EPA and the Minority Business Development Agency (MBDA) of the U.S. Department of Commerce.

The memorandum is designed to combine the resources of both agencies to make minority businesses more aware of, and enhance their participation in, contracts available under EPA grants and cooperative agreements.

EPA will provide advance information on its national procurement opportunities to MBDA via electronic mail and encourage grant and cooperative agreement recipients to use MBDA subcontractors.

Minority Business Development Centers, funded by MBDA, will identify minority entrepreneurs and offer them management and technical assistance for EPA-related opportunities.

Cost of Clean Air and Water

A new EPA report estimates that the cost of meeting federal air and water pollution standards over the 10 years from 1981 to 1990 will be approximately $526 billion.

The report's cost estimates, which are based solely on compliance with federal regulatory requirements, place water pollution control expenditures for the period 1981-1990 at $270 billion, and air pollution control expenditures at $256 billion. These costs include those for capital investment in pollution control equipment, and operation and maintenance expenses.

The report cautions that its findings do not take into account the benefits of environmental programs in terms of improved public health and welfare. Therefore, "these forecasts exaggerate the negative impacts on inflation and economic growth." In effect, the report measures the costs of environmental regulations, but does not attempt to assess the benefits.

United States
Environmental Protection
Agency
Washington DC 20460

Official Business
Penalty for Private Use
$300

Third-Class Bulk
Postage and Fees Paid
EPA
Permit No. G-35