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Two Views on North Carolina's Waste Management Dilemma Interviews with Dr. Bernard Greenberg, Chairman of the Governor's Task Force on Hazardous Waste Management, and Bill Cummings, a leader of the Protect Our Piedmont Coalition

The Resource Conservation and Recovery Act of 1976 requires each state to develop a comprehensive waste management system, providing the public adequate protection from the hazards of storing, transporting, and disposing toxic and low-level radioactive wastes. North Carolina's new "cradle-to-grave" waste tracking system is beginning to monitor waste generation and transport. But many hazardous waste materials pose management questions far beyond transport: some may be recycled or detoxified; others need storage for a number of years; still others require permanent storage and are practically a permanent threat. To deal with a host of technical and administrative concerns to be addressed in creating a comprehensive waste management system, Governor Hunt's Task Force on Waste Management began meeting in August 1980. A final report was submitted to the Governor in March, with legislative recommendations for the 1981 General Assembly.

Chairman of the Task Force is its sole representative from higher education, Dr. Bernard G. Greenberg, Dean of the School of Public Health at the University of North Carolina-Chapel Hill. Dr. Greenberg was interviewed January 30, in the period between the Task Force's public presentation of its draft, and its post-draft deliberations for the final report.

carolina planning: In your estimation, just how serious is North Carolina's hazardous waste problem?

Greenberg: Every state has a hazardous waste problem. North Carolina is now the tenth most populous state, yet it generates an amount of low-level radioactive waste which places it fourth in the nation. The primary reason for that is we generate a lot of electricity in this state by nuclear energy, and when Duke Power's Maguire Plant goes into operation, the waste load will be even larger than it is now. Another reason is that the fuel rods used in these nuclear energy plants are manufactured in a plant in Wilmington, by General Electric. They account for something like 88% of the low-level radioactive waste. The other 12% comes from hospitals, medical schools, research institutes. Low-level radioactive materials are used for tracer studies, for diagnostic work, for therapy in the hospital, and so on. All of that stuff -- the gloves, the clothes, the paper, the syringes, the test-tubes -- everything that's used, once it comes in contact with radioactive material, automatically becomes radioactive. So even if we didn't have this large amount of radioactive waste from the nuclear energy industry, the state would still have 25,000 cubic feet per year of low-level radioactive waste generated by scientific and medical research.

e p: Along with nuclear waste, the Task Force is also dealing with non-radioactive hazardous waste. Is there a basic difference in the way the two types of wastes should be handled?

Greenberg: Oh, absolutely -- they're entirely different. Low-level radioactive waste has to be handled in a different way. Some of it can be stored. If the half-life is short enough, the material becomes almost completely inactive within five or six half-life periods. Other stuff, like C₁₄, has a half-life of 5700 years. If you wait six half-life periods, you're talking about 35-36,000 years, which means permanent handling. But some of the radioactive material, like tritium that may be in your watch, is very low-level and has a relatively short life.

As far as non-radioactive toxic and hazardous substances are concerned -- these are chemicals, acids, some solid, some fluid -- which have to be handled quite differently. Some of them are ignitable, like waste motor oil, paints, solvents, and many of the dyes used in the textile industry. A lot of the material is recoverable; it can be recycled. Some are acids which are corrosive; they'll burn through practically anything. Some of them are toxic substances, like PCBs and the pesticides that are used in agriculture. They have to be de-

toxified, or somehow or other handled in a permanent way; or at least stored until the technology is known to neutralize them or make them innocuous. For example, the PCBs that were illegally dumped on North Carolina roads -- 210 miles of them -- are still out there because the technology isn't known to detoxify them. Only about six months ago, however, a company developed an incineration process for detoxifying PCB. But it has to be done in a lab; we still don't know how to do it on the road. I'm sure the technique will be available someday to detoxify it on the road -- maybe five years, maybe two years, maybe ten years from now. It's all in the process of development, and until that technology is available, we have to have a waste management system whose basic purpose is to prevent the formation of waste, or to minimize the amount to be buried or stored.

e p: Did the Task Force consider suggesting a moratorium on new industries that generate significant quantities of hazardous and radioactive wastes?

Greenberg: No, the problem isn't going to go away if you create a moratorium. Even if you don't have any new industry, you still have enough to worry about the problem right now. You can't stop industry or progress, in the same way for example, that people wanted to stop research on recombinant DNA. Well, it turns out now that the research on recombinant DNA may be the greatest breakthrough in science since the atomic bomb, or atomic fusion or fission. Now they're using genetic engineering to manufacture insulin, to manufacture interferon; they'll probably use it to manufacture various enzymes that may be useful in immunology, and so on. You don't stop science, and you can't stop industry. I think a moratorium is a non-viable solution to the problem.

e p: What about investigating the type of new industry that comes into the state?

Greenberg: There already is a statute in the books that was passed by the General Assembly several years ago. Any new industry that comes in has to be investigated by the Departments of Commerce and Natural Resources



Bernard G. Greenberg. Photo by Harriet Barr

and Community Development (NRCD). Commerce attracts the new industry; DNRCD is supposed to make sure that the impact of that industry upon the environment will not be detrimental to the environment or the health of the general population. So that law is already on the books.

e p: A 1979 survey for the U.S. House Subcommittee on Oversight and Investigation includes a list of 125 North Carolina sites in which industrial wastes have been disposed since 1950. Shouldn't the state's first order of business be attention to these already existing hazardous waste sites?

Greenberg: As far as I know, the Solid and Hazardous Waste Branch in the Department of Human Resources knows about all of these. They're all presumably under surveillance and being monitored by that unit. They're not, I'm told by Mr. Strickland, who's in charge of that unit, hazardous enough that they would even qualify for the federal Superfund that was passed a few months ago.

Our first order of business is to create a system, which we don't have, to coordinate the activities of state government. We now have a number of agencies which have authority: the Commerce Department, Crime Control and Public Safety, Department of Human Resources, and so on. We already have some statutes, but they are not coordinated or stringent enough. So the first order of business is to create a system. What we've recommended is the Governor's Waste Management Board.

e p: That comment brings us to some of the specific Task Force recommendations.

Greenberg: The main theme we are trying to emphasize is prevention. That means the state has to invest some money in research, to invest in technology to assist and advise the waste generators, and to conduct continuing education through workshops, symposia and other forms of education to help waste generators know how to manage waste: how to prevent it if at all possible; if they can't prevent it then to recycle it; if they can't do either one then to dispose of it as safely as possible,

either through incineration on land or at sea, or in some way detoxifying it, making it as neutral as possible.

e p: Some people have suggested that products should have labels disclosing hazardous materials involved in their manufacture.

Greenberg: It's a nice suggestion that will not mean a thing. If you take out a pack of cigarettes and examine it, it says: "Warning -- smoking is dangerous to your health." This hasn't prevented many people from smoking. So if you put on a battery or a bar of soap that this is a waste-related product, this isn't going to change a person's life-style.

e p: Why did the Task Force recommend a board to coordinate present agencies involved in waste management, rather than a separate agency to oversee all aspects of the problem?

Greenberg: There are at least seven or eight departments in state government now that by statute have some authority for waste management. If you're going to create one super-board, you practically have to reorganize state government, re-write all these state laws. This might take two years to study. Moreover, you might end up with the kind of situation that we now have with the Department of Energy. All or most of what the Department has done is regulation; it really hasn't done much toward contributing to the solution of the energy problem. In order to avoid a whole reorganization of state government, we're trying to create a board with a little bit of power and authority that will be able to pull together the present power that state agencies have.

e p: The Task Force has recommended that the private sector take the lead responsibility in selecting and operating hazardous waste facilities.

Greenberg: In terms of either a burial facility or an incineration facility, I think the state is least qualified to act as operator. Then you'd have state agencies supervising other state agencies. It's much better if you can get the private sector to enter the field. There are dozens of companies in this business who have the experience,

the expertise and the knowledge. For example, Barnwell in South Carolina has had a low-level radioactive burial site some fifteen years now, operated by Chem-Nuclear Systems. The same company also operates some hazardous and toxic substance disposal sites under a subsidiary, Chem Security. They're my idea of one of the better and more reliable companies.

e p:

Do you think the background of the waste facilities companies should be investigated before they're allowed into North Carolina?

Greenberg: The companies should be investigated inside and out, backwards and forwards. There's one company that is reputed to be controlled by the Mafia. They came into this state asking for a storage facility and some kind of treatment facility. I understand state officials investigated and found there was no truth to the syndicate allegation. But it is true that this company has been cited by EPA on a heckuva lot of violations. So it has a clouded history. Whether it should have been licensed or not is not my concern.

That is one company that has raised some questions. There are other companies however, for example Waste Management Corporation, that have the resources to do the kinds of things we're talking about. There's also a company that runs a ship, Vulcanus, owned by the Dutch, which will, on contract, incinerate waste far out at sea. This is why we're recommending the private sector. We don't want the state supervising its own facility. The best thing would be to have a private firm do it, and have the state supervise and do all the necessary checking on it. That is exactly the way the Barnwell site is operated, and South Carolina is very happy with that operation. What South Carolina is unhappy about is that the entire country is using it as a dumpsite.

e p:

That's a fear some people have expressed about a North Carolina facility. The courts have ruled that radioactive and hazardous wastes are included in free interstate trade laws; a state with a facility may not legally refuse other states' waste.

Greenberg: Congress passed last December the Low-Level Radioactive Waste Act of 1980. It goes into effect January 1, 1986. It authorizes states to band together to form mutual compacts with exclusionary powers. Right now, South Carolina has already taken the lead to form such a compact with seven adjacent states. Obviously, if we join them, South Carolina's going to want some *quid pro quo*. They'll say we want North Carolina or Tennessee or some other state to have a suitable back-up facility.

The Act applies, however, only to low-level radioactive waste. Right now there is no authority to bar any state from bringing its waste to any other facility. The National Governors Association has recommended that the President and Congress pass legislation similar to the Low-Level Radioactive Waste Act so that toxic and hazardous substances can also be handled the same way.

The problem is it's a Catch-22 situation. Without that legislation, any state that takes the lead runs the risk of becoming the dumping-ground of the nation. That's what happened at Barnwell. On the other hand, if the state doesn't start doing something now, and this legislation is passed, then it's left out in the cold. So you can't go too fast and you can't go too slow. What do you do? We feel that we better have some sort of waste management system in place, that we better be able to move quickly when action is needed.

e p:

Though emphasizing prevention and minimization of wastes, the Task Force has determined that a facility is needed for final disposal of materials which can not be further treated or reduced in volume. The Task Force conclusion that this facility should be a landfill has been hotly disputed by citizens' groups favoring above-ground storage.

Greenberg: In all of the literature that has been published on the disposal of low-level radioactive and hazardous wastes, I have heard of nothing about above-ground storage. After the public hearing in Raleigh, a member of our faculty, at my request, called the Chief of the

Solid and Hazardous Waste Research Division of the EPA. This is the man who presumably knows more about hazardous waste than anybody in the country. I'm reading now from a note that was written to me by this faculty member: "He was not aware of any research or anyone proposing that hazardous waste be stored above-ground as a means of disposal. He suggested that above-ground storage, such as warehouses, storage tanks and bunkers, are part of the problem, and not a solution to managing these materials. He suggested that security requirements, weather, unusual storms (including lightning, for example), fire, increased temperature of contents, greater reactivity, and deterioration of the container would only mitigate against this alternative." I think above-ground storage would be probably the worst hazard imaginable for any waste that's ignitable or corrosive. One of the worst accidents that ever happened was in Elizabeth, New Jersey, where they were storing ignitable material and there was a fire that killed workers and caused millions of dollars in damage.

e p: One of the rationales for above-ground storage is the ease of recovering materials once this becomes economically feasible.

Greenberg: Ah, that's different. I think the first step is to classify the material. If it can be incinerated and destroyed, that would be the best thing. I would certainly never store anything above-ground that was ignitable or corrosive. Waste materials that are not ignitable, PCBs for example, you might be able to store for three to five years in the hope that technology will develop which will enable us to destroy or neutralize the substances. Above-ground might be better in that case. In other words, it's merely a temporary storage. It's not above-ground storage in a perpetual sense. Also, you would never use it for long-life low-level radioactive waste, but you would use it for those materials where you hope the technology would improve. If you keep looking at this stuff pile up day in and day out, it gives you more impetus and encouragement to try and push resources to find out how to detoxify it. On the other

hand, it doesn't mean that when the material is above ground, it's safe. It creates a tremendous security problem. Accidents happen...

e p: What about fears of contaminating the groundwater supply through burial of the waste?

Greenberg: We don't want to put anything in the ground that's going to contaminate either surface or below-ground water. That's the problem with hazardous landfills. But of course Love Canal and some of those things were put in the ground over thirty years ago when there was very little known about the technology of how to site these things -- geologically and hydrologically. There's a lot that's been learned since then. In fact, the packaging is really clay. In addition to impermeable barriers of cement or some type of plastic, you should place a certain type of clay which is impermeable over it. When burial is done properly, as it is being done in some places it should be relatively safe. But nothing is perfectly safe. *Nothing* is perfectly safe.

e p: Let's look at the very controversial recommendation about pre-empting local government authority. I suppose you knew that it was going to be a major source of contention.

Greenberg: Of course. The final crunch comes down to this. We're recommending that everything be done if possible to get sites by local cooperation. By a site I don't mean necessarily burial -- it could be above-ground storage; it could be an incinerator; it could be a recycling plant. When we say treatment facility, we don't always mean landfill burial. If local zoning ordinances attempt to prevent siting -- and we're urging that every step possible be taken to develop local cooperation -- but if it becomes impossible to get any locality to be willing to accept one of these, the state's left with the responsibility. If you're going to have responsibility, you've got to have some authority. We hope the override is never invoked. In the same way, there's an analogy in the field of Public Health. If you have an infectious disease -- say tuberculosis -- you're infectious to your family, to your

friends, to everybody you come in contact with. Every effort is made to persuade you to accept care, to go to a treatment facility. If you absolutely refuse, the local Health Department has the police power to obtain a court order to send you to a treatment facility. In the thirty-five years that I've practiced Public Health in this state, I know of only one or two cases where the police power was actually invoked. There was one case locally where a recalcitrant individual refused to go. But the threat that he could be forced to go was enough to convince him. The police power is never invoked unless it's absolutely necessary. I would hope the same philosophy would apply to this authority to override "spot zoning" by local ordinance.

c p: The Task Force has been severely criticized for lacking sufficient opportunity for public participation. Does that surprise you?

Greenberg: That doesn't surprise me. I don't think the persons who make the criticisms are aware of what the constraints are. The constraint is that the Governor asked for the report by early January. We asked to extend those time limits by five or six weeks, so we have roughly until February 18 to make the report. We've had public hearings as much as we could. We've invited the public to every meeting -- every meeting of the Task Force is open. I've invited public comment at all of those meetings. I and the two chairmen of the technical advisory committees have visited eight or nine newspapers in the state; I've been giving interviews to large numbers of television stations and we've held these seven public hearings throughout the state. There's a limit to what you can do and still get back to the Governor by the time limit in mind. This subject can go on forever. What we *need* to do is to have the Governor's Waste Management Board created, and that Board can continue to have public participation and public hearing. You can go on for public hearing forever and you're not going to get agreement. Nobody's going to come through and say yes, I want a burial site on my land.

In response to the Task Force draft report, no group has been as vocal as the Protect Our Piedmont Coalition. This league of citizens' groups has captured media attention, shown up in the hundreds at the Piedmont (Raleigh) public hearing, and has filed an official complaint with the Environmental Protection Agency against the Task Force public participation practices.

Bill Cummings is a long-term representative of the Friends of Chapel Hill, the group which organized the Coalition. He has worked as an environmental consultant, and is now writing his Ph.D. Dissertation on the ecology of underdevelopment in the Phillipines.

carolina planning: What is the "Protect Our Piedmont Coalition"? Is it basically a single issue group?

Cummings: The "Protect Our Piedmont Coalition" was formed late this fall, stimulated really by what we were learning was going on in Raleigh with the Governor's Task Force. It's composed of environmental, public interest, and poor peoples' groups, largely Piedmont-based. It has a number of concerns. The principal area that it has been working with right now has been the Governor's Task Force. But many of the groups involved have had a long-standing interest in nuclear waste, nuclear energy in the state of North Carolina, and the situation of toxic chemicals. "Friends of Chapel Hill," the group that I'm actually a representative of, and that has taken a lead role in organizing the Coalition, is concerned with broad environmental questions that deal really with the future of this area. We're beginning to raise questions about how one can live here in a sustainable way; we're talking about the long-range future. Some of the things that are going on right now pose irreversible threats, will bring irreversible limitations to the flexibility that we have in our part of the Piedmont, and our region of the biosphere in general. "Friends of Chapel Hill" is made up of lots of families who have settled in and plan to raise their children. Hence, our slogan and one that was adopted by the Coalition, "It's our home, not their business."

e p: The Coalition has criticized the Task Force for its handling of public participation, and filed an official complaint with EPA. The Coalition in turn has been criticized for not attending the Task Force's open meetings, and for not knowing what was going on. How do you explain this contradiction?

Cummings: We've probably missed one, or two, or maybe three meetings at the most. We've had representatives at most of them. Our complaint wasn't whether or not we could be at those meetings; our complaint was that no one knew about those meetings. Agendas weren't being mailed out to the interested public or the news media. I don't think they were expecting any of the public to come. We felt they should have done a better job of letting people know.

Further, as we found out more about the Resource Conservation and Recovery Act, North Carolina was also in violation, if not the letter then the spirit, of the Act itself and the public participation guidelines: thirty to forty-five days notice, depending on the type of business that is going to be discussed, and adequate dispersal of relevant information. Clearly the state failed to do that. Way back in November, we began to point out some of the more serious flaws. In this most recent series of public meetings, when those weren't even spoken of or responded to in any serious way by the Task Force, we decided to make our formal complaint.

e p: Do you think a lot of the problems in public participation were due to a lack of time?

Cummings: Lack of time, but I think behind the lack of time was a lack of willingness to bend the schedule. The people were basically excluded by that. The specific reason was a lack of time, but the deeper reason was a feeling that people don't really need to be involved. Some of the Task Force staff share with me the feeling that the people of North Carolina were lucky to get as much as they did. The Task Force claims it is a special case and doesn't have to meet the RCRA guidelines. We felt that if the state was indeed sincere in

involving the people, then it should have really made a complete effort, bent over a little bit to do that.

e p: Let's talk about your critique of specific Task Force recommendations. In the Coalition's January 19 press statement, you said: "The Governor's Task Force gave little attention to the real problem of hazardous waste: curbing new and continued generation of the waste." Yet the very first recommendation in the draft report is that the proposed waste management system should "emphasize prevention, resource conservation and recovery." These statements have a lot in common.

Cummings: There are parts of the Task Force's work that we agree with. One of our most basic critiques is that the teeth of these recommendations don't exist when one reads the report at a deeper level. On both the prevention of waste generation, and the minimization of the wastes themselves, the Task Force says the right words but unfortunately it's more lip-service than reality. The Task Force has pages and pages to say about a landfill or disposal site, and virtually nothing to say about either minimizing or recycling the wastes. About the closest they get is suggesting a "Governor's Award for Excellence." Somehow that's supposed to make all of this work out. So we felt that the real thrust of the report was calling for a landfill, and paying lip-service to other recommendations.

We also felt that the landfill idea itself was a shoddy one, and one that many technical people, as well as citizens concerned with safety, would take exception to. We found wide support for the call for above-ground storage.

e p: Why has the Coalition stated that "Underground burial is the cheapest, quickest, and most dangerous method of hazardous and low-level radioactive waste disposal"?

Cummings: None of these technologies are certain. They are evolving; there's a great deal no one knows about any of them. The Task Force and many of the state officials continually would say: "Well, this is going to meet EPA guide-



Bill Cummings. Photo by John Gaadt

lines. We don't have to worry about that part of it -- we are going to do what they say." When one goes a step deeper, one finds that the EPA itself isn't sure what to say, and maybe isn't saying the right thing according to some people. Underground disposal is certainly the cheapest, and the simplest. It's basically a hole, and the stuff is out of sight and out of mind.

This relates in part to another thing we feel doesn't receive adequate emphasis from the Task Force, the fact that 'disposal' may indeed be the wrong word. For many of these things, there isn't any disposing of them at all. Many of the radioactive materials and indeed some of the chemical ones remain toxic, remain radioactive for thousands of years. 'Disposal' may give a false sense of confidence, of security. Just a few days before the January 19 Task Force meeting, the Council on Environmental Quality announced that, according to their study, thirty-two states are now experiencing severe groundwater contamination. The likely cause, they felt, was industrial dumping that's finally appearing in the groundwater. Well, as far as we're concerned, that's permanent. We feel that below-ground storage is just a way of getting the stuff out of sight.

There's no telling what it's going to do down there.

e p:

What about fire and security risks of above-ground storage?

Cummings:

We think the security risks posed by above-ground only look greater because we haven't considered the full dimensions of the long-term security risks posed to one of our most basic needs -- clean water -- that are posed by putting wastes underground.

Moreover, if we take the optimistic view about our technological prowess, there may turn out to be ways to detoxify some of these things later, and indeed some of them may become worth something. By storing them and monitoring them, they'll be around to detoxify or to use.

It may well be that the cost of storing some of these things above-ground, I mean the real cost of safety, is so high that a lot of products that are being consumed now -- if one were to pay the full cost -- would be too expensive for anyone to buy. But we're all in favor of finding out what those products are.

e p:

What do you think about requiring product labels to disclose product-related hazardous wastes?

Cummings:

That would be one part of a much broader critique and alternative program that we intend to raise. Much of our criticism has not been directed to just the Task Force itself, but to the Governor. The Task Force in reality was given a very limited charge. It wasn't to look at what happened in the past; it wasn't to look so much at the generation of waste; it wasn't to look at what sort of industries should come to North Carolina; it was given a very tiny portion. Unfortunately, no one else in the state was given any of the other portions in an effective way. There never has been a coordinated and comprehensive look at past, present, and future hazards to people living in North Carolina.

So, part of our concern has been with the Governor's industrial development policy, including

the Department of Commerce. It doesn't make much sense to talk about protecting the public from hazardous waste as long as we continue to be the most aggressive state in seeking out and soliciting toxic waste generators. It's a contradiction. As alternatives, we feel there are lots of creative directions. We could be a real leader instead of chasing a probably false idea; instead of chasing after other states.

C P: Do you believe North Carolina should have any hazardous or low-level radioactive disposal sites?

Cummings: We may accept, and perhaps have a responsibility to accept, low-level waste generated by medical research and medical treatment and present corporations. But we're not prepared to accept waste generated by the nuclear industry, by utilities, which, if plans that exist now are completed, will steadily increase. There are other groups in the Coalition that may not endorse that in exactly the same way. I guess that overall, as a coalition, and as a group of concerned citizens our feeling is that these are the kinds of questions that North Carolinians want to participate in, and our biggest complaint is that they haven't had that chance.

As for hazardous waste sites, I guess in some ways the answer would be the same. We have a responsibility -- I think people are willing to shoulder it in North Carolina -- for wastes that are presently being produced. But it's a responsibility that I think many people are not prepared to accept without knowing at the same time that they have some power; that they're going to play a full role in a dialogue with our state leaders about what kind of future we're going to have here. It may be desirable to phase some industries out. In the last few years North Carolina has made somewhat of a shift in its industrial mix, as a result of what kinds of industries are being attracted. Examples are a number of companies that essentially produce for the auto industry, producers of metal-plating and so forth. Well, there's a question as to whether North Carolinians should bear the cost of such pro-

ducts when the benefits are really enjoyed by people outside the state. It's the same with Carolina Power and Light in the situation with hazardous radioactive waste. That company is owned largely by people outside the state. So there's a question of equity involved as well. All these things are related to the question of whether people will accept a radioactive or toxic waste disposal site.

C P: Assume we have this responsibility, for the time being at least, and a facility needs to be set up. What about the condemnation issue? The Coalition stated "No state agency should have the right to condemn land for a hazardous waste site." Would anyone willingly accept a site in their backyard?

Cummings: We're not sure. We do feel though that as it stands now they probably wouldn't. That should be a good message for some of our policy-makers to get. People in state government seem to think the reason that people are scared is that they don't have the information, that it's complex technology, and that people don't have the brains to make competent decisions. We reject that logic. There are technical aspects to it, but it's not a technical decision. It's a decision that any citizen has both the right, and the legitimate ability, to be involved in. We think more than just fear is the fact that people are not satisfied with the state's or private industry's ability to speak to their needs. The state has consistently failed in North Carolina to protect the public from both chemical and radioactive hazards, and in the few cases where there have been emergencies, has dramatically demonstrated its incompetence, for example with the PCBs.

C P: What, then, is the proper role for the government in waste management?

Cummings: That's a good question, one we think needs a lot more talk. Essentially the Task Force is throwing it off to the so-called private sector. It's interesting that some real problems were revealed in the way the state would do even that. Three days before the new RCRA guidelines went into effect, the state Department of Human Resources

granted a permit to the SCA Corporation in Mecklenberg County to begin a treatment facility for hazardous waste. Well, SCA has been indicted, implicated and connected to the Mafia by grand juries and by reputable newspapers all over the country. The state has been totally irresponsible in its evaluation of private industry in the area of waste management so far. The Department of Commerce has been required for three years to do environmental evaluations of new firms coming into North Carolina, and has never done that. That was pointed out to them and their answer was, well we haven't done it -- you're right -- and probably what we should do is get rid of the law. That's the kind of cavalier attitude towards the public trust that they take. Right now the state has no comprehensive body that is charged with the protection of the environment in general.

C P: What incentives would persuade private industry to deal adequately with the hazardous waste problem?

Cummings: I don't know if it's a question of incentives or of sanctions and penalties -- probably a mixture of both. Tax incentives, for example, could minimize the amount of waste produced, by encouraging recycling and so forth. It may be just a way of forcing them to accept good common sense. A recent article in *Forbes* magazine pointed out the fortune to be found in wastes. I think many corporations are realizing that -- that'll go a long way.

One of the Task Force recommendations was a misdemeanor penalty for some violations. We feel there needs to be much stronger teeth. We've seen with the PCB dumping episode that we're left very vulnerable and unable to respond legally in any way that would ultimately send a message to industry to prohibit further instances of that kind of irresponsibility.

C P: What about the question of liability?

Cummings: We're in favor of strict liability. The argument against that is that certain industrial practices would become prohibitively expensive because of high insurance costs. Our response is that if the insurance companies won't insure it, then

maybe it's not the kind of thing we want to see happening in our state. Indeed, if we're going to have the continued production and use of these poisons, the least the public can expect is that if there's damage, the measure of liability should be quite strict. One doesn't have to prove negligence.

C P: What is your assessment of how serious North Carolina's waste management problem is right now. How essential is it that we take action?

Cummings: Every indication we get is that our awareness of present problems related to hazardous waste and nuclear waste in the state is really just the tip of the iceberg. There's some controversy within state government itself about the extent of past dumping sites. The Eckhardt Committee reported on 125 sites in North Carolina, twenty of which they considered to be serious health threats. At a meeting the other day, of the Triangle J Hazardous Waste Subcommittee, the chairman referred to sanitary landfills as miniature Love Canals in themselves.

We think that North Carolina was spared the kinds of problems now facing other states; but the state has not been nearly as aggressive as it should be in taking care of past problems, in identifying them. In many ways, we think the state has acted to try to reassure the public, but isn't prepared to take the kinds of actions or adopt the kinds of measures that would provide real safety to its citizens. We're hoping that many of our concerns will be included in the final draft of the Task Force report. Our experience would lead us to believe that this may be an unreasonable hope. Nevertheless we continue to believe that people can affect and have some impact on their government. If not, we'll take the next step at some future date. I guess the message we have sent so far is that we're going to be involved one way or another, and we'll do it on our terms, not theirs. It's our home and not their business.

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Carolina planning

Barking Up The Right Tree?

Wood as an alternative energy source appeals to a wide segment of American consumers for a variety of reasons: it requires low technology systems to produce energy; it is a replenishable resource; and it is relatively cost efficient. In many ways, wood as an alternative energy source is a godsend. Under the right conditions, it permits self-sufficiency and saves money. The use of wood is tempered though, by environmental, health and safety considerations. It is important not to let the benefits of heating with wood obscure the very real environmental hazards inherent in wood energy use. Uncontrolled, the highly concentrated pollutants emitted by wood combustion can only hasten the deterioration of environmental conditions. In addition, it is unrealistic to assume that wood supplies will remain stable given the current pace at which wood burning is escalating. The use of wood as an alternative energy source demands some government attention. Wood energy users might also benefit from instruction regarding the use of this valuable resource.

COSTS

The appeal of residential wood heating to consumers is attributed to three features: attractive appearance of wood stoves, renewability, and cost savings of wood. Cost savings are probably the strongest incentive for heating with wood.

The cost of a wood burning stove can range anywhere from seventy-five to eleven thousand dollars, depending on the design. An airtight stove with a thermostatically controlled damper can be purchased for three to four hundred dollars. Adding installation and inspection, the initial cost reaches five hundred dollars. Payoff in terms of lower heating bills increases the benefits of wood heating.

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Local costs of conventional fuel and wood are crucial factors in calculating the wisest heating choice. In rural areas a cord of wood can frequently be bought for as little as thirty dollars, and can sometimes be acquired for no cost if the user is willing to cut his own. Inaccessibility and ensuing transportation costs make wood a questionable bargain for the urban dweller. The cost of wood is already prohibitive in many urban areas.

An important consideration in the selection and installation of wood stoves is safety. Wood stoves are either radiant or circulating. Radiant heaters have a single wall that acts as both the fire box and the outside surface of the heater. Circulating heaters have a second wall which surrounds the fire box, reducing the danger of burns. Southern Building Code Congress International and the Building Official Code Administration specify safety points for stove installation which address location, clearances for shielded and unshielded materials, flue pipes, and chimneys.

Creosote build-up is the most common cause of chimney fires. Creosote is the condensation of unburned gases and tar-like liquids on the chimney interior. The amount of creosote which forms in a chimney is affected by moisture content of the wood, height of the chimney, flue gas temperature, firing rate, ambient air temperature and humidity, and air setting. Reducing the smoke emitted is of primary importance for creosote reduction and can be achieved by allowing more air into the fire at the sacrifice of some of the stove's efficiency.

The following factors reduce the hazards associated with residential wood burning:

1. permits for the installation of wood heating devices;
2. installation inspection by a certified National Fire Protection Association (NFPA) inspector;
3. annual chimney inspections where permits have been issued;
4. installation of smoke alarms and fire extinguishers at the time of initial stove installation; and,
5. safety and installation workshops by NFPA to be sponsored and publicized by re-tailers.

Ultimately, the issue of safety in the use of wood heating appliances rests with the individual operator. Cooperation between the re-tailer (in selling the stove best suited to the buyer) and the manufacturer (in distributing guidelines for safe stove use) should contribute to safe and wise use.

ENVIRONMENTAL IMPACT

Burning wood emits both particulate and gaseous pollution. Particulates in wood smoke are liquid or solid particles ranging from microscopic to easily visible. They are due to the incomplete combustion of wood. Of the many compounds which exist in the organic fraction

of particulates, polycyclic organic matter (POM) is the best known. Harmful POM compounds include carbon monoxide, nitrogen oxides, and volatile hydrocarbons (EPA, 1980).

Emissions from woodburning stoves are categorized as criteria or noncriteria. Ambient air quality standards (AAQS) exist for criteria emissions; several of the noncriteria emissions, which can be environmentally hazardous, are left unmonitored (Kieron, et. al., 1979). Surveys and modeling studies suggest a significant air quality impact from residential wood combustion sources as early as 1976. As a result, the Environmental Protection Agency (EPA) is considering new air quality standards which would regulate emissions from residential wood combustion sources. They are currently exempt from state and local air pollution control regulations. The Clean Air Act Amendment of 1977 requires that all newly installed wood stoves in nonattainment areas incorporate pollution control technology that will yield the lowest possible emission rates.

W.D. Snowden's EPA report, "A Preliminary Study of Woodburning Stove Emissions," offers a thorough analysis of residential wood combustion. During the stable burning cycles emission levels are influenced by wood type and moisture content, firing rate, stove design and excess air ratio. Education of the residential wood burner is the first step in reducing emission levels, as the conditions which keep emission levels low are controlled by the stove operator.

Organic compounds, trace elements, and certain gases in combination with fine particulates can have serious health effects even in low concentrations. Pollutants in a stagnant air mass can accumulate to levels which are especially hazardous for individuals with respiratory problems. Communities are just beginning to express apprehension about the adverse health effects of wood burning stoves. If a large number of people grow to depend on residential wood combustion as their primary heat source, instances of acute air pollution will intensify. Exposure to the pollutants attributable to wood combustion needs to be studied over time and in different regions to evaluate the health impacts accurately. The potential health risks of priority and carcinogenic pollutants from smoke, however, need immediately to be drawn to public attention.

RECOMMENDATIONS

Health, safety and environmental impacts of the use of wood as an energy source indicate the need for public education and government regulation.

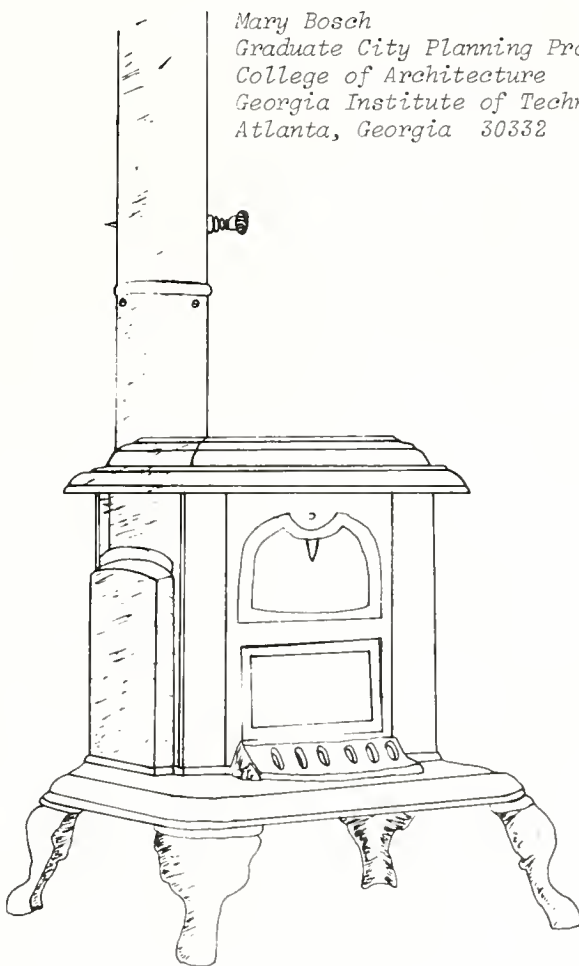
Short courses in wood lot management, safety, emissions control and efficiency should be strongly encouraged by local EPA

offices. Retailers should advertise and make available this information, and perhaps offer workshops themselves. Tax incentives could be provided if necessary. Wood stove permits should be required, their issuance contingent upon passage of a wood burning stove operator's examination.

All wood stove manufacturers should be required to develop an emissions test program to determine the pollution efficiency of their products before marketing. An important step toward reducing emission levels and promoting the redesign of wood stoves, would be to include wood heater emissions in the ambient air baseline. Attachment devices, such as catalytic converters, for use on wood stoves already in operation should be encouraged.

Given the tremendous growth of the industry in recent years, adoption of some responsibility for air quality degradation by wood stove manufacturers is not unreasonable. If wood combustion source emissions continue to go unmonitored, the likely outcomes for all wood-using industries are increased control and reduced growth. These results are inequitable and are likely to provoke industry resistance.

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