VOLUME III

PUBLIC HEARING

before

ASSEMBLY SPECIAL COMMITTEE ON ASBESTOS HAZARDS

(Created Pursuant to Assembly Resolution No. 75)

Held:
November 14, 1984
Council Chamber
Municipal Building
Haddon Heights, New Jersey

MEMBERS OF COMMITTEE PRESENT:

Assemblyman John A. Rocco, Acting Chairman

ALSO PRESENT:

Leonard Colner, Research Assistant
Office of Legislative Services
Aide, Assembly Special Committee on Asbestos Hazards

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TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

* * * * * * *

my: 1-14;25-40
tm: 15-24;41-58

ASSEMBLY RESOLUTION No. 75

STATE OF NEW JERSEY

INTRODUCED SEPTEMBER 13, 1984

By Assemblymen DORIA, HOLLENBECK, OTLOWSKI, VAINIERI, CUPROWSKI, Assemblywoman MUHLER, Assemblymen CHARLES and ROCCO

AN ASSEMBLY RESOLUTION establishing a special committee to study the problem of asbestos removal from schools and other buildings and the adequacy of the standards therefor.

WHEREAS, The Legislature finds that the safe removal of cancer-causing asbestos from schools and other buildings is of paramount concern because of its effect on the health, safety and welfare of the people in this State; and

WHEREAS, Approximately 300 public schools in 20 counties in this State were scheduled to undergo asbestos removal this summer and as of August 29, 1984 it was reported that approximately 200 schools had not received a final inspection and a certificate of occupancy allowing them to open for the 1984-1985 school year; and

WHEREAS, The several executive departments responsible for the safe removal failed to coordinate their efforts and thus failed to act expeditiously to stop the threat of danger to the school children and teachers in this State; and

WHEREAS, It is necessary to determine the standards for the safe handling of asbestos in public schools and other public and private buildings in this State and the best methods of coordination and improvement of the efforts of the executive departments to act responsively to this problem; now, therefore,

BE IT RESOLVED *by the General Assembly of the State of New Jersey:*

1. The Special Committee on Asbestos Hazards is established with a membership consisting of the chairman of the General Assembly Agriculture and Environment Committee; the chairman of the General Assembly Corrections, Health and Human Services Committee; the chairman of the General Assembly Higher Education and Regulated Professions Committee; and two other members of the General Assembly to be appointed by the Minority Leader of the General Assembly.

2. The special committee shall study the problem of asbestos in schools and other buildings; the adequacy of the standards for asbestos removal procedures; the recent failure to expeditiously remove asbestos from approximately 300 public schools; and the role that should be played by the executive departments, including the Department of Environmental Protection and the Department of Health in alleviating this problem. The special committee shall study the issues and recommendations raised in the report by the Department of the Public Advocate dated August 29, 1984 and entitled "Asbestos In The Schools: An Interim Report" and any other pertinent documents and shall evaluate any proposed legislation or laws concerning asbestos removal procedures.

The special committee shall make recommendations for the development of Statewide comprehensive standards for the use of asbestos, including removal procedures, in all buildings in this State and the coordination between the executive departments to ensure a quick and informed response to this problem in the future.

3. The special committee shall be entitled to call to its assistance and avail itself of the services and assistance of any officials and employees of the State and its political subdivisions and their departments, boards, bureaus, commissions and agencies as it may require and as may be available to it for these purposes and may expend any funds as may be appropriated or otherwise made available to it for the purposes of its study.

4. The special committee may meet and hold public hearings at any places as it shall designate and shall report its findings and recommendations to the General Assembly no later than 60 days after the date it first convenes, accompanying the same with any legislative bills that it may desire to recommend for adoption by the Legislature.

STATEMENT

This Assembly resolution establishes a Special Committee on Asbestos Hazards with the responsibility to study the problem of asbestos removal from schools and other buildings in this State and to make recommendations concerning the coordination of the efforts of the executive departments responsible therefor and the development of Statewide guidelines for asbestos removal procedures.

The intent of the resolution is to confront the asbestos crisis in this State caused by the recent problems in carrying out the removal of asbestos from approximately 300 schools. By convening a Special Committee on Asbestos Hazards, the health, safety and welfare of the people of this State will be protected by the development of Statewide standards for the use and removal of asbestos including the coordination of the efforts of the executive departments responsible therefor.

ASSEMBLYMAN JOHN A. ROCCO (Acting Chairman): Good morning. Welcome to the Assembly Special Committee on Asbestos Hazards. Assemblyman Doria has asked me to chair this particular meeting in South Jersey. Several others have been held around the State. Once again, we are very fortunate to be able to have more impact on this issue by having hearings in South Jersey, which is so often neglected, as far as we can see, in so many aspects of the State.

Obviously there is no need for me to get into any detail or comment in reference to this hazard with asbestos. The testimony our presenters will give this morning will certainly shed some light on the problem and give us some ideas as to what the recommendations might be in terms of proceeding ahead.

I would like to thank our Committee Aide and people who have come down from Trenton to help us to have our hearing here in South Jersey, in Haddon Heights.

We will begin with our first presenter, Congressman James J. Florio, who is obviously well known to all of us. I congratulate the Congressman in his recent victory in the Congressional District. I look forward to his testimony.

CONGRESSMAN JAMES J. FLORIO: Thank you very much. Assemblyman and ladies and gentlemen, I am pleased to be here dealing with a topic that I have devoted quite a bit of time to, particularly in the last two years. The committee that I chair, the Committee on Commerce, Transportation, and Tourism has substantial environmental legislation. This whole question of asbestos in public buildings, as well as asbestos in general, and its impact upon health and the environment, is one that we have spent a substantial amount of time on. Unfortunately, I have to report to you that, our efforts notwithstanding, the Federal agencies in charge of this area have really not done too terribly much, and in many respects have contributed to the chaos in our classrooms, perhaps more so than has the problem, in some respects.

Some weeks ago, before the Congress adjourned, I, in my capacity as the Chairman of the Committee, which I made reference to before, held a hearing on the status of EPA's efforts to cope with this growing environmental crisis. Unfortunately, the overwhelming

conclusion, which came out of the hearing, was the Federal government's response to asbestos hazards has been totally inadequate.

As members of the Committee are undoubtedly aware, the only existing Federal asbestos exposure standards were put out by the Occupational Safety and Health Administration (OSHA), and that standard, which is two fibers per millileter, is regarded as totally inappropriate, and is itself being reviewed by people at the agency. As I said, the standard has been criticized, and there is an effort now to tighten it up considerably. Between 1940 and 1980, over 27 million workers were exposed to asbestos. Mount Sinai researchers -- Mount Sinai being the hospital that has really been the lead hospital in dealing with all of this asbestos controversy -- estimate that from 1980 onward, there will be 350,000 premature deaths as a result of that worker exposure.

As for the problem of asbestos in the schools, awareness of the current public health emergency was prompted by an EPA rule issued in 1982. EPA had agreed in 1979, pursuant to a court hearing, to issue certain rules and regulations; they didn't get around to it until 1982. In 1982 they did promulgate a rule which requires all schools to inspect for asbestos hazards and to post a public notice if they are found. The deadline for compliance with this inspection was June 1983. I highlight this because we are all aware of the disruption that occurred in September 1984, when we found the schools were not inspected, and remedial actions were taken, when in fact all of that was supposed to be done in June of 1983.

It is estimated by EPA -- and I suspect it is probably a conservative estimate -- that 15 million school children and 1.4 million school employees work or go to school, as the case may be, in buildings contaminated by friable asbestos, that is flaking asbestos, on a nationwide basis. That means that those children and employees are at risk, and EPA concedes the fact of that existing.

EPA poses the ultimate "Catch 22" for school administrators because the agency has never put out clear standards or adequate guidelines concerning how to deal with this problem. What EPA has done is to say, "Go out and inspect; go out and publish notices that you

have inspected," but EPA never told anybody what they are inspecting for, what the acceptable limits are in order to indicate that action has to be taken. They have never told anybody what to do when they inspect, to find whatever it is they are looking for. And EPA has not provided any resources to do anything. So, you have a very confusing situation, and people are literally in a state of panic. I think we can all appreciate what happens at the school board meeting that comes after the school board officials have announced that they have inspected and have found some asbestos and then published it on the bulletin board and notified the PTA. Parents come and legitimately have concerns about what it is that should be done, insisting that something be done even though there isn't the appropriate guidance to tell us what the something is that should be done.

The funding problem is a very serious problem. The New Jersey School Boards Association has estimated that to deal with this problem in New Jersey it will take anywhere from $50 million to $70 million in our State alone. We, in the Congress, have passed legislation, just within the last four or five months, authorizing $600 million for asbestos removal for the national school boards, but you can appreciate that is not going to go very far, if we talk about New Jersey, alone, taking about $50 million or $70 million of that.

Over and above that, and what was particularly troubling at our hearing in Washington, was that EPA administrators in the asbestos control program stated that they were not even inclined to request any funding in the upcoming year's budget. So that even though the Congress has said there is a need for $600 million, at least, for asbestos removal, the Administration is on record as saying that it is not going to request that any of that money be requested. We will be in a situation where we, again, have told the school boards, "You have to go and inspect," but we are not going to tell them what to inspect for. We are going to tell them that they have to publish notifications of whatever it is they are looking for. We are not going to tell them what the remedial work is that should be undertaken, whether it is going to be removal, whether it is going to be encapsulation, or what the circumstances would dictate as being the course of action.

I note that John Horn is here representing the building trades people, who are very legitimately concerned, as we all should be, about the qualifications of those who are going to be doing the remedial work, whatever the remedial work is. We have instances where people who don't know anything about what they are supposed to be doing, are out in schools and in public buildings, tearing out asbestos, conceivably making the problem worse than it was before they started work.

Certification is a very important thing that we should be doing on a national basis. A new aspect of the problem has been brought to my attention, and that is the question: What do you do with the asbestos when you remove it? We have evidence that asbestos is literally being flushed down toilets, put into public sewer systems, and put into plastic bags and dumped into solid waste landfills. We have to address the problem in that respect.

Mr. Chairman, I would ask that you put my statement in the record in its entirety. I would be happy to respond to any questions.

I suppose my conclusion is, that because of the void that has been created by EPA and the Federal government not doing what it should be doing on a national basis, pursuant to law, pursuant to court decisions, the states are going to be left with the responsibility of trying to do something on an ad hoc basis. That is not desirable. It seems to me that it is inappropriate to have one level of asbestos exposure provided for a child in New Jersey, and a different level of asbestos exposure permitted for a child in Pennsylvania. That is just nonsensical. This is certainly a nationwide problem. There are nationwide standards that should be publicized and promulgated. But, if it is not going to happen, it is imperative that someone take the action, and that someone take the action now.

I noticed in the newspaper that the Task Force, which the Governor has put together, came forward with the some recommendations. I am of the opinion that they merely are recommendations, and that in order to have those recommendations go into effect, legislation is probably required. I am not sure exactly what the process is for the finalization of the Task Force's recommendations. Whenever that takes

place, those recommendations have to be submitted to you -- to the Legislature -- for ultimate enactment into law. My concern is that that process is going to take a very long period of time unless there is some sense of emergency. The law was that these inspections were supposed to have taken place and concluded in June of 1983. They are clearly overdue. There is a real question as to whether the inspections and the certifications that took place in September of 1984 are even valid; also, what were the standards that were used?

I would just try to convey to this Committee a sense of urgency that they should be almost conducted at two different levels: One, that maybe you can join with me and others to get the Federal government to get EPA to do what it should be doing, but in the interim to also be pushing those at the State level to do what they should be doing and as rapidly as possible.

I thank you very much for your attention.

ASSEMBLYMAN ROCCO: Thank you very much, Congressman Florio. As usual, your knowledge of the subject is obvious. Your concern, in terms of hazards, not only to our environment, but certainly to the children of this State and to the nation, is obviously very evident. We thank you for your comments. I think probably one of the real concerns that you expressed which needs a great deal of attention is in the disposal area. I am not sure how much has been done yet in the State in that area, but certainly that is a focus that has to be sharpened because obviously, as you know, with your Superfund legislation we could end up with problems in the future that we may not be aware of unless we take care of it at this point.

CONGRESSMAN FLORIO: May I make a suggestion? We have inquired, and the Department of Environmental Protection has stated that it is their intention to continue to permit asbestos to be put into plastic bags and disposed of in sanitary landfills. I regard that as really outrageous, Mr. Assemblyman. Asbestos is a problem when it is in fibers; there are means by which you can either encapsulate it or stabilize it, and then dispose of it. To literally put it into plastic bags and hope that nobody disturbs it in a landfill is really environmentally dangerous. I think that the Legislature may want to

make some inquiries to DEP as to this policy, which is going on right now, in fact, today, as we sit here. Asbestos is continuing to be disposed of in plastic bags in landfills.

ASSEMBLYMAN ROCCO: That certainly is a focus that I will pursue at this point. I thank you for your attention to that matter and, again, for all of your comments. Everything will be in the record. We appreciate your taking your time out to be with us. Thank you, Congressman Florio.

CONGRESSMAN FLORIO: Thank you very much.

ASSEMBLYMAN ROCCO: Is Thomas Burke here? (affirmative response) Thomas Burke is from the Department of Environmental Protection and is Director of the Office of Science and Research. I am certain you heard the comments of Congressman Florio in regard to some of his concerns.

THOMAS A. BURKE: I certainly did.

ASSEMBLYMAN ROCCO: Tom, if you could give us your testimony today, we would appreciate it.

MR. BURKE: I have entered my testimony for the record, but I would also like to respond, and I appreciate this opportunity. As you see, I am a scientist. I am Director of the research activities at DEP. I think that is indicative of the problem of asbestos. In some ways it is more tangible than a lot of the hazards we deal with because of the clear human data and health hazards with asbestos. There is an awful lot that we don't know about asbestos and the management of such areas as disposal.

I would like to outline for you our current thinking at DEP and also to appeal to you for your assistance because, as the Congressman mentioned, there are things that we do not know, and I would like to try to bring those to your attention.

First of all, I want to say that DEP has been an active participant in the development of the Governor's Asbestos Policy. We very much support the activities that have been undertaken as part of this policy. We feel that they have proposed an action guideline for asbestos in air which is far more stringent than the current Occupational Safety and Health Administration workplace standard. We

feel that they have revised our current minimum specifications for asbestos removal and expanded the training course for asbestos workers. These are things that were obviously necessary for the proper removal of asbestos from our public buildings.

They have also recommended addressing the problem of exposure to asbestos in drinking water and the disposal of asbestos. Although there are numerous activities that need to be undertaken -- both in research and in monitoring -- before we have clear ideas of the appropriate solutions to these problems, we commend those efforts.

As you know, DEP has long been active in the asbestos questions. Since 1976, when asbestos was discovered in the Howell Township schools, we have been active in attempting to get the Federal Environmental Protection Agency actively involved and are in many ways responsible for some of the activities that were initiated by the Federal EPA. I would have to echo the Congressman's sentiments, with regard to the role of EPA. As a researcher, and as a person who has to try and take the scientific data and weave it into the policy decisions of DEP, it is very difficult for us to have the resources to conduct the monitoring, the epidemiological assessments, and the toxicological studies, that you need, to make intelligent decisions about something as complicated as the ultimate disposal of asbestos or any toxic substance, for that matter. I echo his sentiments in hoping that EPA could be a little bit more responsive to the needs of the states.

In a recent meeting with the Assistant Administrator for Toxic Substances, I voiced these concerns. I would hope that EPA is listening to the states. We are one of many. This is a nationwide problem.

I would like to outline the responsibilities of DEP, as we see them. As you know, although we provide technical guidance to the overall policy committee, we are primarily responsible for air, drinking water, and land disposal of asbestos. The regulatory framework of asbestos in air is based upon the well-documented hazards associated with inhalation of asbestos. In 1973, under the Clean Air Act, the Federal government developed a standard that provided for no visible emission of asbestos to be permitted to outside air from

asbestos mills, manufacturing facilities, and asbestos-spraying operations and demolition sites.

In 1976 OSHA issued the current regulation for asbestos air and proposed their standard of two fibers per cubic centimeter of air. In 1977 New Jersey went a little further than that and regulated the release of asbestos to ambient air under our Subchapter 17, our toxic air pollutant regulations, and we expressively prohibited the spraying of asbestos coatings or materials which contained any more than 0.25 percent of asbestos.

Very little is known about the levels of asbestos in New Jersey in the outside ambient air. Part of this has been a research need, but also a very practical problem. As you may know, on a national level -- although it is assumed, and there is some limited evidence that asbestos is everywhere in our environment -- we don't know very much about that. One of the things we will now be undertaking, as part of the recommendations of the policy committee, but also as a research endeavor, is to set up a statewide sampling for asbestos in the air. Although we know about the indoor hazards and the hazards of spray-on asbestos material, such sources as brake-linings and things such as that, contribute probably substantially to our overall lifetime exposure to asbestos. We will be trying to address these questions, to identify new areas for control. Our ultimate goal is to minimize any airborne exposure. As I said, the airborne exposure to asbestos is the well-documented hazardous exposure.

We also are responsible for the control or the evaluation of asbestos exposure in drinking water. Although there are no real positive studies that show that the ingestion of asbestos fibers is in any way as hazardous as inhalation, we feel that the inhalation dangers are evident enough, that we have to be prudent in our approach to drinking water. We want to take a conservative approach to minimize any exposures to our citizens from drinking water. We have outlined steps to do this in our policy document.

Asbestos can occur in drinking water in three ways. Many of our public water supply pipes are made of cement that is reinforced with asbestos. With the acidity of the water and the corrosion of the

pipes, this could lead to degradation of that pipe and release of asbestos fibers into drinking water.

In northern New Jersey we have extensive natural formations of rock that have asbestos fibers in them. This has resulted in some degree of asbestos present in the groundwater.

And finally, the mismanagement of wastes from improper disposal could ultimately be a potential source of asbestos fibers to drinking water.

Obviously, we want to approach all three of these potential situations to reduce any exposure from drinking water.

In 1981 EPA extensively sampled public-drinking water supplies for asbestos and found levels that ranged from "no detectable asbestos fibers at all" up to -- in New Jersey -- water supplies that contained over "50 million fibers per liter." That sounds like a tremendous amount, but in fact, in trying to assess that and understand what the public health implications for that are, we don't have reliable animal tests or epidemologic evidence to really understand what the effects on the GI tract would be. This is a level of concern to us and we want to try and develop rational standards. Our first approach is to be minimize exposure by recommending that no more asbestos cement pipe be used in replacement or construction of new water supplies. We have recommended a number of specific control mechanisms for treatment of the water so that with the corrosive activity which may degrade pipes -- or in areas where there is natural asbestos -- we will not have excessive exposure to asbestos through drinking water.

As you know, Assembly Bill 280 has mandated DEP to develop minimum contaminant levels for selected toxic substances in drinking water. We may, in fact, use this mechanism to establish a standard for asbestos fibers in drinking water.

One question that has been raised, and a difficult one, is our role in the disposal of all this asbestos waste. The Congressman is right; as of now, we are disposing of waste in plastic bags in the active faces of landfills.

Asbestos is a hazard when it is inhaled. It doesn't move around the environment very well. It is not chemically reactive. You can't burn it. It doesn't degrade in the environment. So, it presents an awful lot of unique disposal problems. As of now, because of our scarce scientific data, the current knowledge, not only in New Jersey but nationally, has been that the burial of asbestos represents an ultimate disposal. In fact, this is reflected in our current regulations for disposal. We are now considering, and making comment on, proposed new regulations for disposal. One of the questions is: Although burial does appear to be one alternative that may be potentially satisfactory, is burial in the active face of the landfill appropriate when we may have stirring-up of the fibers and things like that? These are one of the things which we are trying to consider.

As a researcher, I would like to appeal to you for your support of appropriate programs, within DEP, which can evaluate this disposal method and alternatives. Right now, as I said, we do not have the capability to do air monitoring. We don't know the air levels of asbestos around these active landfills. We would also like to test for leachability of the absestos to see if potentially this is leading to contamination of groundwater around these sites. As we try to devise our waste-disposal alternatives, I would like you to realize that right now, there is a limited scientific data base on which to base that, and the current state-of-the-art is land disposal, although we do recommend research to address that issue.

In closing, I would just like to say that DEP has been involved for almost ten years now in trying to bring asbestos to the national forefront as a hazard. It is one of our most well-documented toxic substance hazards. There is human data there. It is not speculation about laboratory animals or anything like that. I think our position has to be that we will use our authorities in the environment to minimize exposure wherever possible, but our responsibility is also to develop the adequate scientific approaches so that our control mechanisms do not create problems for us later, and so that we can better understand how to control these hazards now.

I would be glad to answer any specific questions.

ASSEMBLYMAN ROCCO: Tom, is it Dr. Burke?

MR. BURKE: Yes, it is Dr. Burke in two weeks. I defend my dissertation right after Thanksgiving.

ASSEMBLYMAN ROCCO: Very good. Good luck to you. I do have a few questions, just to pursue the disposal questions, because I think that is here and now. Presently you are using landfills; is that correct?

MR. BURKE: That is correct, although right now the asbestos has to be wetted down and put into thick plastic bags and kept in a sealed container until it is then disposed of in a landfill. That is our current regulation.

ASSEMBLYMAN ROCCO: Okay, but when it gets into the landfill, it is simply plastic covering on the asbestos?

MR. BURKE: And there must be three feet of clean fill placed over the asbestos at that time to separate it from other wastes or activity.

ASSEMBLYMAN ROCCO: Okay. You answered some of the other questions in terms of the leaching and the potential damage to water in and around the areas of the landfill. You are doing something in that arena right now, or it that something you are looking for?

MR. BURKE: We are, and we are trying to evaluate the information that is around. There are some worst-case scenarios of industrial facilities in New Jersey and nationwide where asbestos, because of industrial activities, has been buried by companies for years. Literally tons of asbestos has been thrown into the earth. There are monitoring wells around these facilities, and we are trying to get an idea of just how well asbestos may migrate through the soils and become a groundwater hazard.

It doesn't appear, in these cases, that it has, although I will be the first one to admit that the activity of a sanitary landfill or industrial waste landfill presents another type of problem. There is a gap in the scientific data there. We are concerned about that, but unlike many of our industrial solvents and things that have become the pervasive groundwater contaminants in New Jersey, there doesn't appear to be physical or chemical reasons why asbestos would pose a grave hazard; but, we need to understand that a little better.

ASSEMBLYMAN ROCCO: Well certainly in the disposal, at this point, do you feel tnat it is adequate with just the plastic? I personally would have great concern about that.

MR. BURKE: Asbestos, as the Congressman pointed out, can be bound using chemical sealants to try to make it more of a congealed mass, but then you have to understand that you are burying this waste, and although that may make it less available in a ceiling or something like that, burial is ultimate disposal. This will ultimately break down too, so that is a temporary solution. Once something is buried in the ground, whether it is in a steel drum or anything else, we know that the environment is real good at degrading things and breaking them down to their natural components. This will ultimately happen with asbestos. It may delay the process for several years, but that kind of binding and things like that really don't make long-term sense for burial disposal.

Right now, as I said, there are gaps in ultimate disposal. The debate now, both within DEP and from the comments we have received on the regulations, is whether or not there should be a dedicated facility at these landfills. Although we know that, perhaps, burial of asbestos is a temporary solution, let's define where we put it -- and not in the active face of a landfill with everyone's garbage, but in a defined spot, so as we know more about it or as we want to control it through monitoring wells or whatever, we would have a defined area and would have minimized our future risks. I think that is one way we could improve the situation.

ASSEMBLYMAN ROCCO: That is certainly one of the points that I was leading to. Are we accurately keeping records of exact locations of present disposal, so that if we find in the research to come, that we are doing things improperly, or that it is a danger to the environment, we can get to the source as quickly as possible? Whereas, if we don't identify locations, and let's say in the 360 schools around the State that are disposing of asbestos as they work with it, if it is just disposed of without identifying locations, I think we have a problem. I think the dedication of certain locations or some procedure to identify where the disposal is taking place is absolutely critical,

and a simple thing to do. As long as we have to dispose of it, it is simple enough to keep a record at DEP of the sites that are involved and some means of identification for future needs, either to pull it back out or to at least identify it. You say that is going on?

MR. BURKE: This is a proposal now in revision, and under our responsibilities because of the Governor's Policy Committee, and it is a consideration that we are now working on. I would say that hopefully we have a good chance of— Once we determine the feasibility at the landfills of doing this, of initiating that and having that, we are--

ASSEMBLYMAN ROCCO: (interrupting) Okay. What I am going to do right now is to certainly take note of your comments, in terms of looking to do that as quickly as possible, but I think I am going to do more than that. I am going to ask my legislative aide to get on some legislation in that regard. I think that is absolutely a push that can't wait for committees to have their hearings and the rest of it. I think that if it needs legislation, then we will go ahead and do that. I think it is absolutely critical as we are going through this whole process of it being disposed of. It could be just anywhere, and we won't be able to get to it in the future, unless we have identified locations. So, Jeff, have that ready for Monday.

MR. BURKE: I would appreciate your help with that. Obviously it makes good scientific and environmental sense to contain your problem. We don't have all the answers now, but this will certainly make it easier in the future.

ASSEMBLYMAN ROCCO: Thank you very much. Do you have anything additional to add?

MR. BURKE: No, except that, through our participation with the Asbestos Policy Committee, I hope that we will, not only be addressing some of these environmental issues, but lending our expertise to the actual public health questions that arise through the school disposal and other issues.

I thank you for this opportunity.

ASSEMBLYMAN ROCCO: We will certainly look at legislation in the future. It is a little disconcerting, to say the least, that we really don't know where we are with the air quality or--

MR. BURKE: (interrupting) I would emphasize that also.

ASSEMBLYMAN ROCCO: (continuing) --or even the water quality. I think these are like base levels that have to be identified so that we know where we are headed.

MR. BURKE: I might expand upon what DEP is doing in water. Right now we are conducting a survey of all water supplies to see who has asbestos pipes -- obviously that is a potential source. We will be implementing ways to treat the water so that the aggressive index doesn't get to a point where we have degradation of these pipes.

ASSEMBLYMAN ROCCO: Excuse me. Can I interrupt you for just a second? Maybe John Horn might have the answer. Of course the asbestos pipes are no longer in use; is that correct? They are prohibited somehow?

MR. BURKE: No new--

ASSEMBLYMAN ROCCO: (interrupting) That is a logical assumption, but unfortunately logic doesn't always follow.

MR. BURKE: You are absolutely right. There is no new asbestos pipe being used. There are tremendous amounts out there existing.

MR. ROSSNAGEL: (from audience) Correction. It is only sprayed-on asbestos that you cannot install. You can use asbestos for piping today, tomorrow. I will fill you in on that.

ASSEMBLYMAN ROCCO: I would like to hear more about that because that is something that would be of concern to us.

Dr. Burke, good luck to you.

MR. BURKE: Thank you.

ASSEMBLYMAN ROCCO: Brian Bramell, President of Alternatives Way, Inc. Is Brian here? Did I pronounce that right, Brian?

BRIAN BRAMELL: Yes. Before I start, can I just make a couple of comments on the landfill issue?

ASSEMBLYMAN ROCCO: Certainly. Go ahead.

MR. BRAMELL: I would like to before I get into my testimony.

ASSEMBLYMAN ROCCO: It is your time.

MR. BRAMELL: My firm deals on a day-to-day basis with the problem.

ASSEMBLYMAN ROCCO: Could you tell us a little bit about your firm?

MR. BRAMELL: Sure. We are an environmental consulting and testing firm, located here in Haddon Heights. We are consultants to over 500 school projects. We work in 30 states. We work for every branch of the Defense Department, the General Services Administration, and the V.A. Hospitals, as well as numerous private clients. So, I am speaking more from the standpoint of seeing, on a day-to-day basis, what goes on in the field. That is why I want to make just a brief comment — it is not part of my testimony — on the landfill issue. We talk a lot about the groundwater and the procedures -- what is supposed to be done, etc. -- but the reality I am concerned about is that the bags are not being gently taken out of trucks at a site, placed into a hole, and backfilled with three feet of dirt. Trucks are being backed up, bags are being dumped, and then they run over them with a bulldozer to compact them before they cover them.

I am also concerned about the fact that they are not identifying where in the landfill this material is being placed. And, more than its migration into the groundwater, I am concerned about the fact that any good sanitary landfill requires venting of the gases that build up. And, as those gases migrate through the landfill and through the asbestos material to the vent-ports, I believe the asbestos material is going to be vented, much more so than there being a potential for it to migrate through the clays and the underlinings.

ASSEMBLYMAN ROCCO: So, ultimately, in the future the methane gas, or whatever, is going to be throwing up the asbestos?

MR. BRAMELL: It will be vented in conjunction with the methane gas.

Anyway, I want to address, as part of my testimony, more of a chronological problem I see occurring, and how it relates more specifically to the policy which has just recently been proposed.

I am going to attempt to show a breakdown in the process while going through my testimony. The law requires that all owners of public buildings, be they schools or State buildings, be forced to operate under a low-bid situation. In my opinion, it is ludicrous to think that we will ever do an appropriate job of removing a known human carcinogen from a building, particularly buildings that house children, under a low-bid situation.

If one is going to put up a basketball backstop or rebuild a curb, or do something along those lines, fine, give it to the low bidder. If one is going to deal with a known human carcinogen, then it is time to evaluate other factors very critically.

ASSEMBLYMAN ROCCO: That's kind of like the astronauts who go up into space on a low-bid. I don't know if we are really ever going to change that. There are too many other factors involved.

MR. BRAMELL: Well, my next comment is, if building owners must award contracts under a low-bid situation, then we have to have a good procedure for pre-qualifying those contractors.

ASSEMBLYMAN ROCCO: Yes, depending on how the specs are written. You have to set the specs up.

MR. BRAMELL: The problem that occurs right at the moment, for school districts at least, is that if a contractor has been pre-qualified by the State, the school district has no right to -- or very little right -- to prequalify that contractor.

In the past, a contractor literally had to have insurance, bonding, a one-to-ten day course, and be breathing at the time of the application to be qualified.

A school district, where I was a consultant, had a contractor in -- in a previous year -- to do a painting project. When he finished repainting the hallway, he stood back to admire his work, lit a cigarette, blowing up the hallway of the school. He had never had any experience with asbestos at all. He was low-bidder on the asbestos project for the next year. Because of the fact that he had bonding and had attended a one-day seminar, he was low-bidder and the attorney couldn't justify denying that contract.

The State, under their new policy, has prequalified contractors who have been thrown off of asbestos projects. They have prequalified a firm that is presently being sued by the State of New Jersey for doing an inadequate job.

ASSEMBLYMAN ROCCO: Brian, correct me if I am wrong. A school district's school board can set up the specs for their specific, individual school district, and their specific job.

MR. BRAMELL: That's correct, but through the Department of Education's adoption the State's policy— I am not a lawyer, sir, but when dealing through the Department of Education, which has given that right up to the DBC, a contractor can go into court and get an injunction against a job by saying, "This job cannot start because I am prequalified by the State. How can you deny my starting on this project?"

ASSEMBLYMAN ROCCO: Okay. I think it can be denied simply by the school board putting out the regulations pertaining to that individual job.

MR. BRAMELL: A school district needs guidance on that because, to be perfectly honest with you, when I propose that to a school district, I can hear the solicitor's knees start to knock. They just simply—

ASSEMBLYMAN ROCCO: (interrupting) Then change solicitors. I have done that a few times.

MR. BRAMELL: Yes. Right. The school board's attorney just has a fear of a very tight timetable in order to get it accomplished over the summer. If court action is imposed, due to a non-bid award, by the low bidder, the time is being used up that they need to get the project accomplished, if nothing else.

ASSEMBLYMAN ROCCO: So, I guess the point you are making is very specific. The specs should be written to exclude those who are really not qualified.

MR. BRAMELL: Exactly. The specs have to be written in that instance; and also, we need support from the State when they prequalify people, so that people who shouldn't be prequalified aren't being prequalified.

In the past, there has never been a good mechanism for disqualifying a contractor who is doing an inadequate job. I understand that a mechanism is now being put in place: Reports coming from my consulting firm, and from other consulting firms, are being used as part of the mechanism for disqualifying someone for doing a project incorrectly. I am concerned. The mechanism for that should be set up properly, so that "ABC" contractor, who was "XYZ" contractor,

can't open a business tomorrow and be in business again after being disqualified.

The next point is, and I think Mr. Florio touched on this, we are dealing, right now, under a very emotional climate. School districts are being forced to act to inspect their buildings with very little guidance and help from regulatory agencies as to how that should be accomplished. When you tell a group of parents that they have asbestos in their building, they panic and they demand it be taken out.

I have a school district, right now, that has just authorized us to spend two and one-half million dollars of their money -- above my objection, above the State Health Department's review, above NIOSH's review, above EPA's review, and above Mount Sinai's review of the building -- on asbestos that is sound and well-maintained. They have a trained custodial staff, but the parents have panicked and are demanding that it be removed.

I think a critical part of any policy should be an educational program for the general public, to inform them, "Yes, asbestos is a hazard; it is a hazard if it is airborne; but, not all forms of asbestos are a problem." There is asbestos in the shingles on the roofs of our homes, but in that form it is not really a problem until a fire occurs.

So, we need some assistance in order to calm the panic, and in order to deal from a more rational decision-making base.

The State has proposed a minimum specification. I applaud the fact that they have tightened that up, considerably. I would ask them to go a step further and turn that specification into law. As Mr. Florio pointed out, EPA and OSHA will readily admit that their regulations are grossly inadequate. Right now, we are operating under a specification program where, if a contractor is doing something wrong he is not necessarily breaking the law, and it becomes a contract dispute: How good is good; how bad is bad? If he is thrown off a job, there is an injunction, or something occurs; the job does not go forth; and school does not open.

We need assistance from the State. They should make that minimum State spec a regulation, so that if there is a violation of a

building code and if a contractor is doing something that does not meet the spec, he has now broken a law. He can be fined and he can be taken off the job through a normal stop-work order, issued through the building inspector process.

My last major point is that you have included a program for training workers. That is absolutely essential. I have some reservations, however, in that you have to remember the educational level of many of the people who are the laborers involved with asbestos. I would propose that you consider a three-step certification system for asbestos: A certified foreman must be on the job site every day, continuously, during the operation of the project. That foreman must go through an extensive program of first aid training procedures, law, contracts, personnel protection, and everything that is necessary to be a foreman on a project.

There should be a second level of individuals who are trained and certified to set up critical environmental barriers, negative pressure systems, decontamination chambers, and all the environmental constraints that go along with these projects.

There should be a third level of worker that needs to be trained, relatively simplistically, in how to protect himself. That is all these people are going to be able to grasp. They are not going to understand what happens when the yellow light goes on when they are in a negative pressure system. They are not going to be able to understand how a negative pressure system works.

These are the people who are hired by a contractor the night before, a contractor who walks into a bar and asks, "Does anybody want to go to work tomorrow at $18 an hour?" and everybody raises their hands. These people have no understanding of what a respirator is, how it should be used, or how to decontaminate themselves. They really do not have the mental capacity to learn much beyond that. They are the people who are brought in on a project after all the environmental systems are set up and who do nothing but scrape asbestos off a ceiling and put it in bags. That is the ultimate objective for them. They are not going to sit through a 32-hour course and understand any of it.

The ultimate objective for these people would be to train them in how to wear the respirator; how to protect themselves; and how to know it is wrong when a contractor tells them -- and this happened this summer -- "I am out of filters for your respirator, but don't worry, roll up some paper towels, put them into the cartridge, and that will filter out the asbestos materials." That is documented in reports we gave to the Health Department.

So, rather than asking everyone to go through a 32-hour training program, you should consider the type of work the individuals will be doing and their mental capacity to actually understand what they are being trained in.

I have some other comments in my written portion, which I will simply submit for the record. The one thing I would like to state is, public hearings are very good for giving input on concepts of regulations -- an overview on how things should be done, and on some problem areas. However, we are into a very technical field, much of which has just been pointed out. The research hasn't even been done on this. Scientists are still debating it.

The Report gives a lot of technical information. In it, they are setting levels, and they are setting a lot of parameters -- a lot of technical things that I believe have to be debated. I believe the Governor had a provision for members of private industry to serve, or give advice to this panel, when it was being developed. I personally was taken by the shoulder of my jacket and led from the room when I tried to give some input. I requested, several times, to be able to give input, or to serve on the board.

I think a group should be put together, a group which consists of testing firms, consulting firms, architects, engineers, contractors, suppliers of materials -- the people who deal with it on a day-to-day basis. You have consulting firms in this room. We are out there every day on those job sites. We see what is going on. We are aware of how some of the things are going to be very difficult to implement. These are not things I can give you testimony on, and which you can take back to someone. These are areas where we have to sit down across the table and kick back and forth. I think that is going

to be essential in order to come up with a policy that is defensible in court. And, so much of this is going to be— Asbestos is going to be the number one, most litigated subject in this country's history, from what they are saying.

If you have an arbitrarily set level for a post test you can't defend in court, then you haven't really accomplished very much. I, obviously, would be willing to serve on that panel. However, there are many qualified firms out there. I would be more than willing to say: "Here is a representative from the consulting/testing aspect; let the architects put forth a representative; and, get a group of people together who can respond to this kind of a debate."

I thank you, and I am more than willing to answer any questions you may have.

ASSEMBLYMAN ROCCO: Brian, thank you very much. Since you are in our legislative district -- in District 6 — I can assure you that Jeff Land, my legislative aide, and I will be in touch with you in regard to this topic. Obviously, you have had a lot of experience in this area and we will hopefully take advantage of some of your experience as we put together legislation, because ultimately legislation is going to be the only way to fly. I am not one who believes much in the Administrative Code, simply because legislators have lost the legislative oversight ability we had over bureaucrats. That no longer exists, and I am not comfortable with any Administrative Code. I want to see this put into a legislative package, and then move from that point on.

MR. BRAMELL: That will make my work a lot easier because I won't be threatened with a suit everytime I shut a contractor down. I can say, "Look, you have broken the law; here is what the law says."

ASSEMBLYMAN ROCCO: We will definitely be in touch with you. Make sure Jeff has your card.

MR. BRAMELL: My name, address, and telephone number are all in my testimony. I will give you my card also.

ASSEMBLYMAN ROCCO: Thank you.

Doctor Peter Frasca. Is he here? (no response) Dr. Frasca is not here.

Okay. How about David Lummis, or someone from the firm he represents. David?

DAVID N. LUMMIS: A lot of the information I planned on talking about in this testimony has already been mentioned. But, as an architect, I will try to give my own point of view.

Again, my name is David Lummis, I am an architect with Kolbe and Poponi, architects and planners of Cherry Hill, New Jersey. I have been associated with the firm since 1979, and I have been registered since 1982.

This past August, I attended a two-day symposium on Asbestos Project Management in Washington, D.C., which was sponsored by the National Association of Asbestos Abatement Contractors. It dealt with all aspects of the dangers, and the necessary corrective action for the asbestos problem.

We have prepared plans and specs, and administered contract documents for four projects so far. These include the Camden Home for Children, Lower Alloways Creek Township Elementary School, Penns Grove Schools, and the Camden County Vocational and Technical Schools -- which have not yet gone out to bid. We have also prepared plans and specifications for asbestos removal work at the U.S. Naval Reserve Center in Poughkeepsie, New York, but we were not involved with the contract administration for that job.

For our four New Jersey-located projects, we have prepared specifications, based on the New Jersey Minimal Specifications for Asbestos Removal. However, with each one we do, we feel there is a need for greater public and asbestos-removal worker protection, and we revise our specifications accordingly.

The minimal specifications currently require concentration of asbestos fibers, after the final cleanup, not to exceed 0.1 fibers per cubic centimeter, based on a 240-liter air sample.

From information I have received, and read about, the Asbestos Abatement Industry currently recommends a level of 0.01 fibers per cubic centimeter, based on a 960-liter air sample. Levels far below this would be hard to obtain, even by a competent contractor, because there are asbestos fibers in the air all around us just from

everyday exposure. For instance, the tile floor here (indicating floor) contains asbestos. It is not friable; therefore, it is legal and it is still being manufactured. They don't call it asbestos anymore. But, it is all around us. If you go out in the air, it is all around us.

Levels far below the 0.01 would be hard to obtain, and they do not necessarily create greater public safety.

A recent change in minimal specifications permits the testing laboratory to be hired by the contractor. I do not understand this reasoning, but I believe it is a definite conflict of interest, as the testing laboratory must protect the owner's interest by making certain that the contractor does not expose the environment or the workers to higher levels of asbestos fibers than are specified.

All asbestos-removal work that has been bid, has been awarded to the low-bidder. And, as was just mentioned, that's the way the public work system is. So far, we have been fortunate that all of our contractors did a good job. But now that asbestos removal has become such a booming business, more and more contractors are getting involved with this type of work. In public work, where the contract must be awarded to the low-bidder, and in private work, where the owners are attracted to the idea of saving money, the basis for awarding the contract is not necessarily based on the competency of the contractor. Performing an asbestos-removal job with an incompetent contractor often poses more of an exposure problem than if no work were done at all. The prequalification of contractors must be studied thoroughly so that incompetent contractors are weeded out; or owners in public work must be able to accept the bid of a competent contractor, even though he is not the low-bidder.

Asbestos-removal work performed in schools over this past summer throughout the State received much attention from the media. The general impression of this coverage was that the asbestos removal work was sloppily done and would create an exposure problem to the children, forcing the schools to delay their opening. Our project for the Penns Grove Schools this past summer was listed as one of the projects which did not receive final approval from the Department of

Education. This created a lot of concern on the part of the parents in the school district, even though the work had been completed with final air-testing results showing fiber concentrations far below the specified levels. In other words, we were clean. The problem was that the Department of Education was so backed up with other projects, also requiring inspection, that many schools did not get their final approvals in time. The media focused on these few cases where the work was done improperly and they failed to clarify that these problems did not apply to all the schools on that list. While it is proven that asbestos exposure is a serious health problem, the media magnified the problem, creating unwarranted public anxiety.

I will conclude my written statement by saying the asbestos problem is a serious health hazard because there is no apparent safe exposure limit. The industry has the knowledge and the means to remove the threat where it is found, but it will never be totally eliminated. It is necessary to either remove the asbestos or otherwise contain the release of fibers so that the exposure and its related health problems are minimized. The minimal specifications should be reviewed and changed, where necessary, as more and more asbestos removal projects are performed and the bugs are worked out of each. Removal techniques and equipment are constantly being improved and this should be reflected in the specifications.

Basically, that is what we are here for today -- to kind of review all of this. I hope that things are changed so we are relieved of this problem.

ASSEMBLYMAN ROCCO: Thank you very much, David. Please make sure we have your written testimony for the record. We appreciate your giving of your time today to present that testimony to us.

Is Norman Cohn here? (not present)

Is Eileen Kirlin from CWA here? (not present) They said they weren't going to be here.

Is there anyone else who would like to testify today?

BILL ROSSNAGEL: (from audience) Rossnagel.

ASSEMBLYMAN ROCCO: Do you want to come forward please.

MR. ROSSNAGEL: I had written; I thought I might be on the list.

ASSEMBLYMAN ROCCO: Okay. Your name is not on the list, but that is no problem. Just make sure that we have copies of your testimony. When you get to the mike, just read into the record your name and who you represent.

MR. ROSSNAGEL: John, I would love to have you look at this as I go through it.

ASSEMBLYMAN ROCCO: Okay.

MR. ROSSNAGEL: How much time do I have?

ASSEMBLYMAN ROCCO: As much time as you need to get your point across, I guess.

MR. ROSSNAGEL: My name is Bill Rossnagel. I am President of Rossnagel and Associates in Medford, New Jersey. I live in Cherry Hill. Mr. Rocco, you and I last met on the battlegrounds of Pop Warner football with our sons.

ASSEMBLYMAN ROCCO: Okay.

MR. ROSSNAGEL: I am going to go through this handout today. We have provided you a copy so that you can follow along. I am in the position where I want to tell you both sides of the asbestos problem. I tell it to you as the test engineer who did the testing on the famous Howell Township schools that was mentioned earlier. We have been in the business of testing asbestos for 14 years. I go back 25 years. It has been associated with problems, in the air work I did in the aerospace industry.

I ask that those in the audience and on the Board please hear me very carefully because I will probably give the most candid talk that you are ever going to hear on asbestos. I really need three hours for this, but, of course, I am going to cut it down to 10 or 15 minutes.

My main point is that there are three basic related diseases from asbestos, from lung cancer to the dreaded and almost fatal mesothelioma. And yes, 2,000 people -- and almost all men -- are going to die this year and every year for the rest of this century due to the horrible exposures that they had back in the 1920s, 1930s, 1940s, 1950s, 1960s, and 1970s. And some of us in the business know it is still happening in the 1980s.

What I am asking you to do here today is to really try to hear my message, and that is, we must be able to separate the causes and the results of the horrible asbestos exposure that these men -- 98% of them are men -- received. The horror stories are terrible. You have seen them on television. The ladies who washed their clothes got it. Even a hairdresser for women who worked in asbestos plants died of the dreaded mesothelioma. I have shaken the hands of two men who had mesothelioma who later died. I know a third who isn't going to make it till Christmas. This makes it a very special tragedy personally to those of us who are in the business. I would like to also add that every item Brian, as the head of another testing and consulting firm, mentioned before, I agree with -- each and every one that he listed -- and I endorse them.

We have heard about the horror stories and the cover-up stories. Real quickly, in 1898 the first lady ever appointed to the British Inspection of Factories Office pointed out that there was a horrible problem with the breathing fatalities of men who worked in asbestos plants. That is one of 30-minute audiovisual slide shows that I am in the process of selling to public broadcasting systems.

Beginning in 1970, we had our "Earth Day," and then by 1972 OSHA was going after the first three big contaminants, one of which was asbestos. Mr. Burke mentioned Howell Township before. That is true. We did the testing; we helped make the decisions on that. Even though the airborne levels were only one third of the then-allowable-limit for industrial exposure, I made the decision to remove the asbestos from the four Howell Township schools. The New Jersey Health Department at that time did not make the decision; they didn't have the capability of making it. They do now, but they didn't back then.

I would like to go over a couple of points. I must also add that Mr. Burke said more data was needed and that the State had very little data on the testing of asbestos in homes. Well, they should ask Rossnagel and Associates because we have tested over 200 homes. I was one of 18 men requested to go to the EPA hearings on May 7th in Washington D.C. and talk about that. Part of the results about that are going to be in the handout I gave you today.

This is one of the classic problems; the State agency -- I will speak more about that and this Asbestos Policy Committee -- doesn't use the consultants that are available.

I would like to point out that the high percentage of deaths, noted on the bottom of page two, reported by the experts and doctors -- like Dr. Selikoff of Mt. Sinai Hospital -- can be 60%, but they apply to those men in industry and the associated women. It is no more applicable to apply those death rates to janitors, students, and staff in a school than it is to apply the unfortunate Marine Lebanon death rate to the Marines who are on duty in recruiting stations around the country. I point out to you that I have often been accused of being against removal work. It is not true. In 1983, alone, my firm made the decision to remove $6 million worth of asbestos in Pennsylvania and New Jersey.

I also point out -- and this has been mentioned previously too by Brian -- that at least 50% of the asbestos removal work that is being done now doesn't need to be done. It is the result of a highly emotional public. I have put in this paper that I gave you what you can do and what we can do to try to explain this to the public. That is what I will talk about next.

First of all, let's take a look at the percentage of lung deaths. This data comes from the U.S. National Center for Health Statistics. I have shown, on page four, in this table that all the cancer deaths among men have been the same or are going down, except for lung cancer. But I also show you, by this arrow at the right-hand corner, (indicates on page) the total number of men's deaths due to asbestos, including the horrible 2,000 situations a year that have affected so many American families. Please realize that when we add all of these together, the total, including that 2,000 a year, comes out to be the cause of two percent of the deaths of American men due to lung disease. Three percent of it is due to blood clots and miscellaneous items and 95% is due to smoking. This is medical data. All I have done is superimpose the Mt. Sinai asbestos death data on top of the United States government death data. I have included, back on page three, that this turns out to be 71 out of every 100,000 male

deaths, and it jumped up in 1935, which was 15 to 20 years after the smoking increase in World War I. And similarly, the women's death rate for all lung diseases is 20 out of 100,000, about one third of the men's statistics. That started to peak in 1965, 15 to 20 years after the big increase in women's smoking in World War II.

My point is that when we consider all of the legal cases brought to date from-- Now there may be other people who are injured and are suffering, who naven't sued. Less than 24 people have sued to date, due to an asbestos claim that is related to schools. That isn't 24 per year; that is 24 in total.

What I am saying, Mr. Rocco, is that we have to find a word. Industry, the doctors, and the pathologists have not done it. They have not been able to separate the horrible failure rate from industry to a wholly different failure rate, much lower. And I should say death rate rather than failure rate; I didn't mean to imply a disrespectful term. The fact is that, in total, there are only less than 24 people who have used legal action which claims that their illnesses or their deaths are due to an asbestos exposure in a school. Again, that doesn't mean we don't have to take it out. We made a decision for $6 million of removal in 1983. But again, I saw so much removal that did not have to be done.

Going to the bottom of page three again, I want to point out that the root of all of these problems is the numbers that the industrial hygienists, the doctors, and the engineers have used. For instance, you have heard the two fibers per cc is the OSHA limit. It still is today, but you have to remember cc is three-eighths of an inch by three-eighths of an inch by three-eighths of an inch. We have to realize that you take that two fibers and multiply it by one million, and two by one million comes out to be two thousand, per cc, when we make the correction. So we come out with the fact that it is the same as two million fibers per cubic meter. And you, sir, and everybody in this audience today is going to breathe from three to nine cubic meters of air today. That means that the level could be from six to eighteen million asbestos fibers. That is the industry level. We all know that New Jersey was a leader. Our State has been a leader in all types of

environmental controls which are tighter than other states. We had 0.1 as the number.

What I want you to realize now is that the State is pushing a number of 0.003 fibers per cc, which turns out to be three thousand fibers per cubic meter. This means that you are going to breathe from three thousand times three to three thousand times nine; in other words, nine thousand to twenty-seven thousand asbestos fibers. The problem is that everybody talks about a number of 0.003, and it makes the people in the back of the Board of Education meetings think that number is near zero. Even our new Asbestos Policy Committee Reports keep talking about a number of 0.003, and the whole public has the impression that with this number, they can get all the asbestos out of the schools because it is so near zero. But you have to multiply it by one million, and then you have to multiply it by, from three to nine cubic meters, a day. If you are a kid who shoots baskets in a ghetto street right next to the road, particularly in the canyons between three and four high-rise buildings, like in Camden, Bayonne, and Jersey City, where we have gotten very high levels, or if you are a jogger along the highway, your numbers are not nine thousand to twenty-seven thousand asbestos fibers; it could be fifty thousand asbestos fibers. So, that is one of the things which we don't need more data on. We have plenty of data. This is what I have tried to show in my handout.

Please flip over to page five. I told the 12 men who were present for the Asbestos Policy Committee Report on November 5, at the hearing in Trenton, that they did a very poor job. It is incredible that the EPA calls me down and others — 18 people out of the country — to give testimony in Washington, and then the State of New Jersey goes and puts together an Asbestos Policy Committee Report -- and I have it from inside information -- and they never consulted anybody outside of the State agencies. Only three or four — four, I'll say — of the 35 men who formed that committee have ever been suited up and inside an asbestos-contaminated area in an asbestos-removal project. That is akin to having people design an airplane who never even flew in one. What is especially bad, and why I say they let their Governor down is-- I can remember sitting in my living room last December when

the Governor announced this policy committee, and he told the men, who he put in charge of it, that he wanted them to consult with the asbestos removal contractors and the consultants and to integrate this whole thing and come out with a new Asbestos Policy Committee. It is incredible that the 35 men in that group didn't-- Some of the minority people on it -- minority in quantity; I'm not connoting anything else with the word minority -- repeatedly asked if other people could be brought into this. Just as Brian mentioned, he would be willing to serve on it. We have offered to be up there and answer the questions.

I listed on the later pages, pages six, seven, eight, nine, and ten, detailed major blunders, totaling 35 items, that are in that State Asbestos Policy Committee Report. There is one thing that gets me, and that is when someone puts out a document that comes out six months late and then they put a September date on it, when it is not available to the public until the middle of October. But that is only the beginning of what is wrong with this report. I am not going to go through all of them here, but I have listed them all for you. They depict the level of asbestos, which is below what the 200 tests that my company made in homes and parks. We did a major study right here in Cooper River Park. Mr. Rocco, you would be interested in that. We have a building in Cherry Hill; it is a six-story black building on Route 70. You probably know the one I mean. They had a problem there because there was asbestos on the fifth and sixth floors. When they went to renovate it for new tenants, and they found asbestos in it, they had the contractors walk off the job. They couldn't lease it for over two years. It is owned by a big company in Boston. We did all the testing. They lost other tenants because of the panic on the upper two floors of the buildings. And yes, they had asbestos in plenum changers, and yes, they had a problem, and yes, we had to make some recommendations for removal. In other cases it didn't have to be made.

This is an example; this is what frustrates the hell out of me -- when the State people say that they have no data. We have tested over 200 homes. We have gone to court on it. The bottom line in our system is when you go to court. Why doesn't the Health Department in

New Jersey, the Asbestos Policy Committee, and the New Jersey Department of Environmental Protection feel like listening to a professional engineer who has gone to court on asbestos, who has been involved with it in his own company for 14 years, and totally for 25 years, and who gave testimony in Washington? I am not the only one. They didn't contact anybody. I said they let the Governor down because the Governor certainly promised all of us that all these other inputs would be in.

My pages six through ten are giving you my specific items. I would like to read every one of them. I am not going to do that because I think I would take too much time. But I submit and ask that the Board please review each and every item that we have listed.

I have listed, on page eleven, all the State's test requirements, and I put it into a matrix to make it easy to understand. I have two books published on the check-list concept, and this is what we do, so that when we send our men out to the field they have a simplified version of what they do. That is what the State wanted on item eleven, except I put in "visual inspection." Anybody who works in this business knows that the final visual inspection counts from 50% to 75% of your final accept decision on the removal work. The State Policy Committee Report was so inept that they never even included visual inspection. I did them a favor by putting it on here to try and overcome the blunder that they made by not listing visual inspection, which is 50% to 75% of the final accept/reject criteria, the remainder being the results of the air test.

Then, on the following page, page twelve, I listed what would be the alternatives. They are planning on using transmission electron microscopy. Less than -- Mr. Rocco, these numbers are right -- one thousandths of one percent of the air asbestos testing in this country, done to date, has been done by transmission electron micropscopy. It has never been to court. There is no government agency which has written and accepted a procedure for it, yet that is what the State of New Jersey wants to go to, when there are only two of those units in commercial labs in the State. And the State doesn't even have one. It is a terrible thing; they are picking a criteria for which the

equipment isn't available. It is the most costly method. It has never been to court. I ask that you compare page eleven with what the State wanted, remembering that we were kind by including the visual inspection that they left off.

Page twelve is what we listed. We did go into some scanning electron microscope work -- SEM. Dr. Frasca, who is going to testify, and I hope gets to do it, will talk to you more about that. He is one of the leading men in the several states around here. Many of the testing firms like mine who cannot afford that $250,000 instrument use his local firm right here in Camden. What we are saying is "Let's use some scanning electron microscope work with the limited conditions that we have here."

I have also changed, on page twelve, in the upper right-hand corner, what the allowable limit would be. You have testimony of 0.01 fibers. I happened to have still put 0.05 in there. We can only meet these tighter numbers; we can never meet the State number of 0.003. They copied that from the EPA ambient data, and never read my May 7th testimony because I said the EPA data must have come from a pristine location in Yosemite National Park about five miles from the nearest road. You can't get that number; you can only meet 0.003 and it would have to rain for three days, and it would have to be in an area that was nowhere near streets, where 90% of all the airborne asbestos is coming from -- from asbestos brake linings. So I ask that you, please, compare these two. We would be glad to talk on it more.

On page thirteen, I have listed the fact that even New Jersey, with this latest Asbestos Policy Committee, has come out with a number that sounds-- I am repeating partly what I said before, that 0.003 number, fibers per cc. They are proposing to use a method by transmission electron microscopy; when you get all done, you divide by a number 30 or 33, which is an averaging effect that contributes a big error. Ridiculous. There is no sound basis. Someone mentioned before, that to arbitrarily set criteria without technical justification, instead of picking it-- I don't know who it was: administrators, attorneys, or whoever picked this thing. There is no technical backup for what they did. But again, that 0.003 number makes

it sound so small. It is one billionth. It makes the average woman who is worried about her children in school think that the level of asbestos is so near zero, when it isn't. And I repeat again, that each of us, on an average, will breathe from 9,000 to 27,000 asbestos fibers today.

I will continue on. I will only need five more minutes, if I may have it. I have included my full testimony in the later pages. I have started into the second page two, from the second batch. I have listed here what the asbestos requirements are that are applied to industry and in the workplace. That was the first of the five points that I made. I then show the mathematics behind this number which say that we are not breathing near zero asbestos fibers; we are breathing 3,000 to 9,000. I show that in the picture here, which shows the small person or the person who is not too active, who breathes around three cubic meters of air a day. And then, some of the bigger people with higher metabolism and other factors, or someone who jogs, can breathe much more than even the nine cubic meters a day that we show. This is what we do, when we multiply the fact that the number 3,000 and fibers per cubic meter, which is a very, very low level-- I say it can't be met after a removal project, and I am backing up what someone else just previously said.

On page five, I listed my second point. This is a lot like the point Congressman Florio made. Congressman Florio has been a speaker at my company's annual seminar. We have run the only regularly scheduled annual seminar on asbestos in the country. We have run it for 12 years, but the last four years we have been specializing in the asbestos, fiberglass, and formaldehyde problems. We point out here that the EPA certainly ducked it. I am sure with your school and administrative and State background, you know how the EPA required inspections of schools in June of 1983. By the way, we are still getting notified of about one a week that has not complied with that June of 1983 requirement, and we are trying to help them. The point is that the EPA has ignored, in fighting with OSHA and NIOSH, a lot of the phase-contrast data, the optical data that they could have used. They didn't have any of the criteria to tie in that requirement of the June, 1983, inspection with other State agencies.

I list on page 5.1, my complaint about the EPA and their outdoor ambient air. They picked a level of outdoor ambient air; if you look on page 7, I have superimposed the average of our over 200 ambient home, park, parking lot, and shopping center asbestos level tests. If you ever want to know the asbestos levels on a given day, 50, 100, 150, 200, 250 feet between the gas station and the Cherry Hill Mall, that is one of the locations that we do the testing on.

When you look here and see the EPA documents in black, we are saying that in the shaded areas, the levels of asbestos are one hundred times higher in the real world. Knowing some inside names down there, I have tried for two-and-a-half years to find out where the EPA got their data. No one will tell me, which means, I think, that they realize it was in a very pristine location, and it shouldn't be the ambient level which the states act on, such as New Jersey acting on the number 0.003. New Jersey's required 0.003, in their new procedure, is after all the asbestos has been removed. Yet, our testing in over 200 homes is an average of 0.0035. You might say there is not much difference, but remember we are talking averages. That is why we may have 0.01 or 0.02 or 0.04 as the level. We may be lucky if it rains, but if we are going to set a criteria for what the asbestos removal is going to be after it is done in a school, we have to make that apply for all New Jersey schools, and not one that is 300 feet from the nearest roadway.

Another thing that we also have data on -- and Bayonne High School is a typical example -- is after the asbestos was removed and we did testing. The testing was required by the State and EPA to be done within 48 hours; you can get the results back within 24 or 48 hours. Bayonne asked us to do the same test a month later, and we got higher numbers. Part of the emotionalism problem is that some of the people thought the numbers were higher because it was a lousy asbestos removal job. It wasn't true. We were higher for two reasons: One, because they had had five HEPA -- what we call high energy performance absolutes, high efficiency performance absolutes -- filters, the type of special extra-fine filter that is used to capture these asbestos fibers. Five of them were used in the building. That building was so

much cleaner with those five units running in a six-weeks program; it covered the whole building. When they stopped using those units and opened the windows, the asbestos levels from the outside airborne street -- that we all breathe -- came in. That was the reason for the higher numbers. This is why we are approaching a level. New Jersey has gone below the level that is the ambient asbestos level in the State.

I ask if you could please, somehow, as busy as you are, find the time to go through this whole thing.

Again, my third point is that the EPA had implied to all the schools that if they remove the asbestos, the level will go to zero. The level does not go to zero. I have shown on page nine, that levels one, two, or three -- typically various higher-ambient levels of Bayonne or Jersey City schools up against the canyons of the high-rise brownstones -- would be the highest level, number three (indicating on page) and the others down. Then you have an up and down level while you are removing the asbestos. But after the asbestos level is removed, it doesn't go to zero. So many school boards have spent hundreds of thousands and millions of dollars thinking that they are going to get rid of the asbestos. First of all, you can't get rid of it all. You can get rid of an awful lot of it, but not all of it. But the main thing is that the airborne asbestos level does not go back down to zero. It goes to a level of one, two, or three, which I have shown here (indicating on page), and that converts to around 9,000 to 27,000 asbestos fibers again.

My fourth point is that the EPA -- and I say this with some reservation because I am talking about the Federal government's Environmental Protection Agency— I remember when they sent people up to my firm after the Howell Township school program in 1976 and 1977, and we enlightened some of their people in what the state-of-the-art was back in 1977. I saw the internal struggle already. They right away were against phase contrast microscopy; that is the type of microscope system that costs $5,000 to $6,000. It is the kind that firms like mine can give fast results on. It doesn't count all of the

fibers below five microns, the micron being a millionth of a meter. But it counts, perhaps, 75%, to 85%, to 90% of them, and has been used in court for over 25 years by each of the five government agencies that I have listed on page 10. The EPA has come around and is using that type of method now, along with others.

Mr. Rocco, I watched a terrible bureaucratic infighting thing; when you got to know the technical numbers in it, it was sickening to see the way our intergovernmental rivalry was coming out of Washington and the Research Triangle Institute.

I also want to point out that the EPA has left people so confused because at one moment they say, "One asbestos fiber can cause mesothelioma," the dreaded mesothelioma that is almost always fatal. That is true. And any one colon cancer germ that hits anyone of us in this room here today can terribly affect our lives too. The EPA at the same time allowed a pneumograph and a risk algorithm, which allowed 12 out of 168, as a scoring system in which they would allow the asbestos to be there. That was a big conflict; it made it very difficult. Some of us try to point out that asbestos is only a problem when it is airborne. When you have that cotton-candy kind of a sprayed-on asbestos, in almost every case it should come out, particularly where there is air movement in front of it or the kids can get at it.

The hard decisions are coming up when we talk about the cementitious-type ceiling, the typical troweled-on or sprayed-on one-quarter to three-eighths of an inch thick, light brown, acoustical ceiling tile -- you might call it -- sometimes five to ten percent asbestos. I would rather have my children in a room with 50% asbestos in it, the bound-in, good-hardened type, than have them in a school with 5% asbestos where every time the Cub Scouts meet on the second floor and jump up and down, it vibrates it into the air or for whatever reason, it becomes airborne. This is the type of problem we can help with; we can still resolve this if we can somehow get the State Asbestos Policy Committee to look at the testimony, to really go through what was told to them on November 5th at that hearing. You have an exact copy; the only thing that is changed between what I gave them and your copy of my testimony today is the cover, which is stating a different location.

My fifth and final point was that certainly when the EPA required all of this school inspection work to be done by June of 1983, they should have at least had a copy of those documents sent to the State health and environmental agencies. They just ducked that whole issue.

I have listed on the next and last page some of the nine asbestos articles I have published and the titles of audiovisual tapes which we would make available, at no cost, to your committee, particularly the one on "Asbestos Part I - Asbestos: A Chronological History of This Health Problem" and the other, "Asbestos Part II - Asbestos: Important Decisions to Be Made." The one on Part III gets deeply involved with testing methods. We would make any and all of this information available to you and your committee at no cost.

I thank you for letting me talk a little too long.

ASSEMBLYMAN ROCCO: That is all right. We certainly appreciate all your testimony. It is quite interesting. I will take what I consider to be-- If your data is correct-- It is like the base of anything; if we are basing everything on the wrong number — 0.003 — as you have indicated, then everything else is kind of moot because if that level can't be reached, then we have a significant problem up and down the line. That seems to be your testimony today, that the most significant thing that I can turn to in our committee and with our aides is to find out what the data is, in terms of how others see it. I am sure that they just didn't pick the 0.05 out; there had to be some reason for them selecting that. We have to find out what those reasons were.

MR. ROSSNAGEL: I picked the 0.05 as the upper limit. Now remember, there may be some special case. We have gotten a 0.003, but not on an average. Our average of these many tests in over 200 homes and parking lots comes down to 0.0035. The average after asbestos removal jobs is about 0.015 or 0.02. Now the reason I put 0.05 on page 12 is when we are setting an accept/reject criteria, we don't set it as an average. If we had an average speed limit, we would have a hell of a time every time we got stopped by a cop.

ASSEMBLYMAN ROCCO: What is your figure after removal? 0.015?

MR. ROSSNAGEL: No. I am saying, on page 12, that I would recommend—

ASSEMBLYMAN ROCCO: (interrupting) What do you find now after removal to be the number?

MR. ROSSNAGEL: You mean an average?

ASSEMBLYMAN ROCCO: An average.

MR. ROSSNAGEL: The average after removal is 0.015 to 0.02. But just like a lot of people drown in an average of three feet of water, you can't set the accept/reject criteria at the average, which is the middle. That means 50% of them above that are going to fail. That is why I picked a number of 0.05 on page 12, in the upper right-hand corner.

ASSEMBLYMAN ROCCO: Yes, I have that noted.

MR. ROSSNAGEL: We know from looking at— That is one of the good things about this system. I don't mean to say that everything is wrong. But the requirement that they do the airborne tests and get them done within 24 to 48 hours— We can tell. If people that are monitoring— And again, I endorse what Brian said; good God, let's not have the asbestos removal contractor do the air monitoring. That is like having the wolf watch the chicken coop.

ASSEMBLYMAN ROCCO: Sure.

MR. ROSSNAGEL: The buyer or the school or the factory wants to employ the air monitoring firm as his on-site quality control. What we are saying is that we need to have a number that we can enforce. We can tell when a job is out of control. We can tell immediately by the high numbers we are getting during the removal operation.

ASSEMBLYMAN ROCCO: Okay. All I am saying is you bring to our attention a very significant base problem, if 0.003 is something that we can't really work with. I think that is something that we should do a lot more work with, in terms of getting research data.

Secondly, are there other types of materials presently being used? We talk about the asbestos pipe and some other things that you see as a hazard that are still being utilized in the building industry.

MR. ROSSNAGEL: Asbestos is still allowed to be installed today and tomorrow in anything except sprayed-on building construction insulation applications. It is still the best insulator and the best chemical resistance and the best electrical resistant material. It is still needed in industry, in my opinion. Less than one percent of the cars coming off the Detroit lines today have a non-asbestos brake material because it is so good at that. It is cheap, besides all other things. Those limits were against it use in construction.

ASSEMBLYMAN ROCCO: I guess my question is, are any hazardous materials presently being used? That might be a better question.

MR. ROSSNAGEL: You mean other than asbestos?

ASSEMBLYMAN ROCCO: That utilize asbestos, that are still being produced. The question really is, have we put a stop to those things that are a hazard that utilize asbestos?

MR. ROSSNAGEL: I don't know of any applications of asbestos that are hazardous. Certainly the Consumer Product Safety Commission was right three years ago to stop the use of it in women's hair dryers. That was certainly something that slipped through the crack and should never have happened. Just two weeks ago, my company ran the first seminar for brake-removal contractors because we see so many brake overhaul shops that don't know to wet it down, or don't know to get rid of— How many of us did brake overhauls when we worked in garages with the compressed air blowing up the big cloud of dust? I did it for two years, working my way through college.

So, there are applications when asbestos is being used where we still feel there are not full controls. There are refineries and there are utility boiler shops that have one man in charge of repairing all the insulation, and many of them will not even wear a respirator. That is a separate problem. I see no application where it is being used as a hazard. The men who are doing it should be aware of the controls.

ASSEMBLYMAN ROCCO: I am not concerned about the personnel problem and this particular question at this point, as much as the future — the same as the disposal question that we had. In other words, what can we do to protect the future in terms of this problem?

In terms of materials, you indicated at this point, you are not familiar with anything that you would consider to be extremely hazardous that is presently being utilized in the trades?

MR. ROSSNAGEL: You are not limiting this to organic chemicals? You are talking about asbestos-related?

ASSEMBLYMAN ROCCO: Asbestos-related. Anything that we should be aware of that poses a problem to our health.

MR. ROSSNAGEL: The main one is— I was on the phone at 9:00 this morning on it, and that is, OSHA does not require the enclosure with plastic and the HEPA filter. That is required on all school removals. And again, New Jersey has been the leader on it. But there is a major boiler utility operation going on today, last week, next week, which my company is monitoring. We are trying to get that major utility and its major New York engineering firm, who is writing the specs for the New Jersey removal firm who hired us, to do the air monitoring. We are trying to get them to use the HEPA filter, and they don't even enclose it. There is a major gap right now in that the good requirements that have been made, that asbestos removal contractors seal off the area, use disposable clothing, and have HEPA filters in schools does not apply in industry today. If you owned a factory, Mr. Rocco, you could remove asbestos today, as long as you didn't get caught at it by OSHA coming because the wind blew through your factory a lot and your airborne levels were below that two fiber limit -- which is so much higher than where the school limit was. It is twenty times higher than what New Jersey's 0.01 limit was.

A major gap is that in industry today, you, as a factory owner, could go in and rip asbestos out and you don't have to pre-notify anybody unless you are taking out more than 160 square feet or 260 lineal feet. So that is a major gap. Industry does not have to meet the requirements that the school people have to do, under the present requirements.

ASSEMBLYMAN ROCCO: Okay. Thank you very much, Mr. Rossnagel. We will certainly use your data. Since you do live in the district, once again, if we can call on you as we start putting legislation together, I would appreciate it.

MR. ROSSNAGEL: Thank you.

ASSEMBLYMAN ROCCO: Thank you. Is there anyone else who wants to speak to the Committee and make a presentation on this topic?

NORMAN COHN: I am Norm Cohn.

ASSEMBLYMAN ROCCO: Okay, Norman. We called you earlier, so we are glad you could make it.

MR. COHN: It was an asbestos related issue which caused me to be late, so I missed all the good things that Brian said and most of what Rossnagel said. But even though I didn't hear much, just let me pick up on some of the highlights.

It is my opinion that most of the push now is due to the much-talked-about problems with removal during the summer — especially in the schools. I have not heard from any of the media, and, quietly spoken of -- even in the State Department of Education's Facility and Planning Spaces — is the fact that of the schools that did not receive Certificates of Occupancy prior to the week of school opening — 200 were listed in the newspapers -- nobody bothered to allow for the understaffed and overworked inspectors who were kept out on the road for weeks at a time before they could get their documentation back to the facility. And, during the week prior to school opening, when the men first started to come in and drop off several weeks' worth of road work inspections, all of a sudden there were schools that had been inspected -- from the preliminary inspections, through the work inspections, and down to the final inspections. All of a sudden, there was a block of inspection work dropped off.

So, the original statistics concerning all the schools that were not able to open because they were "so bad they couldn't open" -- that paperwork was sitting in briefcases, in the cars of those men who were on the road.

We happen to have two inspectors who live in this end of the State. They were sent from both ends of the State, and the guy who lived furthest away had to go to South Jersey, and the guy who lived closer to South Jersey had to go to North Jersey. They literally lived out of their cars.

Whatever it is worth, the summer inspection listing did not appear as bad as it actually was, at least in our estimation. And, I

am sure that if the dates that came in on their inspections were actually looked at -- by this time I am sure there is enough paperwork gathered on that data -- their inspections would show that it was not as bad.

To jump into something Mr. Rossnagel brought out, he pointed out that five microns was the limit of his phase contrast microscope. The phase contrast microscope, which is an optical unit, has two limitations: The optics themselves, and a one-quarter wavelength of light. It is very scientific. You cannot see what the light fails to come up to; and, a one-quarter wavelength of light is the limit of whatever would reflect, and that is put down at approximately 0.025 microns.

So, if one starts getting fibers that are narrower than that figure, one is not going to be able to see them, no matter how good an optical microscope he has. It just cannot be seen.

The electron microscope is not restricted to that -- and I am not pushing for the electron microscope. On the one hand, the electron microscope is at the same disadvantage as the phase contrast microscope is at when it sees a fiber: It hasn't the slightest idea of what kind of a fiber it is either. Now, there are certain fibers that, by the way they are built, tell you they are not asbestos. One very prominent one, in most cases, is cellulose. Cellulose has a shape that none of the other fibers have. But, an asbestos fiber -- unless one sees actual criteria that is associated with that particular asbestos fiber -- looks like a pencil, a tree, or a straw, as we like to call it. It looks the same way to the electron microscope as it does to the optical microscope.

It needs a second facility to be able to tell what it is. Now that a fiber has been identified as not just a particulate, it can be zapped with X-ray in order to see what its internal makeup is. What are the elements that make it up? Now that you see the elements, you can say, "Aha, that fiber was indeed asbestos."

When NIOSH put out their recommendation for a phase contrast versus electron microscope, they justified it strictly by economics -- that the cost in those days was $25 to $60 to run a phase contrast

analysis, and it was $250 to $400 or $500 to do the electron microscope analysis.

On a per-sample basis, one didn't pay the men that much in those days. One sample taken was almost a day's worth of all the labor one put in.

A comment made to the Camden College— What is it that is down there in Williamstown?

ASSEMBLYMAN ROCCO: Camden County?

MR. COHN: Camden County College -- there you have it. They were getting ready to do their work, and they had just about every one of their tests scheduled to go electron microscope. A comment, made by someone sitting right next to the microphone, was: "The only thing you are going to get out of it is something better than twice the cost of the removal job, because a little more than half of it is going to go toward paying for the analysis, and not for the removal itself."

In a work area, you know you are going to release asbestos fibers, if, indeed, there are asbestos fibers in the material. If there are asbestos fibers, it is telling; but a lot of the asbestos jobs were done in answer to somebody's push: "Aha, it is a ceiling that looks like asbestos; therefore, it is asbestos; therefore, handle it as asbestos, whether it is asbestos or not."

The cost to go inside a work area and take a look at the task— Someone specified it required a 48-hour period, but "run it an hour if you must," and there was a potential to overload the cassette -- and this is going back to the early days -- to the point where the laboratories were under the gun not to call them overloaded, which, by procedural definition, was 20 fibers per field. Sometimes you could see a gorgeous field sitting there with 60 or 70 fibers -- they were just laid out almost like Indians, or like soldiers -- versus a clump of this mess. The new procedure by NIOSH, the 7400, is looking to alleviate this by saying, "If it is a clump you can't see, just call that field 10" -- a magic 10. That way you can move on to another field where you are not looking for that. And, the specifications are continually copying -- to answer the question regarding what this time weighted average is -- to run it all day: "Pick two tests and run them

all day; get a time weighted average; take two or three tasks and do it for 'this many minutes,' but take the tests all day," and then they don't match up. And, to put them under an electron microscope and add another $200 or $300 to today's prices, is just going to— My taxes are going to go up; and I am not sure how many others are going to go up also, just to meet this; and what information are we going to get?

There was a comment made about the use of the HEPA filtration system. If we lock up the room, as the State has put in their appendix for the drawing, it is not capable of allowing air to flow in -- to make up air to flow in. We now have a sealed space. If we put in this HEPA filter, under one specification there is no limit to it, so we let the air flow back in on itself; we short-cycle it; and allow it to literally wash the air.

In another specification it tells you to send all filtered air outside -- either outside the spaces or outside the building itself. That literally puts that space in a vacuum because, again, if the ceiling is done "honestly and according to the specification" -- and I put that in quotes -- no new air can come in; you send out somewhere in the order of 1000 to 2000 cubic feet of air and you can't get 1000 or 2000 cubic feet of air in.

Fortunately, nothing that has been worked on -- and that is with exception — has been airtight; so, some air leaks in.

If, the State's drawing -- as we have tried to get them to do many times — was to build an air valve, instead of an air lock— And, I will take credit for that, back in the early days -- five, six, or seven years ago — I said, "Let it be an air valve, just so long as the filter is working." This was in the days of the wooden and the tin box filters, not the nice steel ones that are coming out now, or the gorgeous plywood ones that are coming out from some of the companies. But, if you had the air valve, whatever the count of the air was outside -- which is always the makeup air -- it could now wash in through the decontamination chamber and continually push back, inside the work area, whatever the men might be bringing out -- and, I use the men just as a reference because there are several contractors now who are using both sexes within their forces. It would wash back from the

decontamination chamber into that work area and allow the HEPA filter to get another crack at grabbing whatever fibers are loosening.

There was a push, a couple of years ago, to have a requirement for HEPA filtration, per job. We have one contractor, also in the district, who is a leader in pushing for changing the air four times in a warehouse; therefore, changing the air four times in the work area. Every fifteen minutes you would take out the volume that was in there. Unfortunately, not too many of the contractors who are now using their HEPA filters understand the way the air flows, and they would just meet the requirement by having so many filters to handle so much volume of space. They take it in the door, put it through the filter, make sure there is a negative pressure, and the other end of the room, where the work is going on, never gets a chance at this air flow. Those fibers hit the floor and must be filtered up; or, they must finally migrate back toward the filter; or, they must wait until everything is cleaned. Just the movement of the men in the clean area then gets some of these fibers to migrate back, to be trapped in the filter.

The State specification picked up the need for HEPA filtration. It also picked up the need for instantaneous readout, which, again, back in the days when UCA and Bedford developed it -- again, with Federal moneys -- would tell you whether or not there were fibers, and not just count the particulate. And, like any machine, you can fool it sometimes. If you throw too many particles in, they may line up once in a while and it will count them as a fiber. On the other hand, if too many fibers come by, in order to protect itself it will say, "Woops, there are too many," and it will shut itself down for a moment.

But, when you correlate that GCA fan -- the Fibrous Aerosol Monitor -- with the optical microscope, you will find a very close correlation well within that magnitude, as Rossnagel brought out, and this is on the spot. While you are sitting there you can watch these counts go up if there are any fibers for it to pick up. It is also selective in its fiber size. So, whereas a five-micron-sized fiber has been limited, an engineering fact is that if it is too small, you might

not be able to see it again; and if it is too large you won't nave to worry about it because it will be heavy enough not to fly, and that will get picked up individually. The Fibrous Aerosol Monitor has a requirement which says, "right at the spot" -- at the chamber, at any other location, out in the middle of the facility in the clean area, even inside the work area -- in order to see what the counts in there are, so that procedure can be changed at that point.

Another point that was raised was, who hires the tester? When the first State minimum specification came out, it applied the requirement for the testing to the contractor, because the contractors were doing their own testing. When that minimum specification came out officially, there was one change made to it -- one major change. That major change was to say that the testing facility -- an independent testing facility -- will be hired by the building owner. A year later, there was one line changed in that specification, and that put it back with the contractor, who would hire the testor.

In conversation with the Department of Facilities, which didn't even know the change was there, the then Asbestos Task Force, which was quietly sitting down waiting for a new chairman -- since Ian Mitchell was gone at the time, they couldn't get a group together, and there was no real push for it -- stated that there were too many monetary complications with making a contract in two different areas; it was much easier to leave it with the contractor, who would have the responsibility to hire the testor. The word "independent" stayed with it, but it was still up to the contractor to hire an independent company, and if you go down through its listings, you will find half of the same people doing the removal.

The 0.05 that was raised by Mr. Rossnagel -- if you go back seven years ago, or thereabouts, 0.05 was the limit we put on the GCA; if we could have an average of 0.05 at the end of a job, we would guarantee that the optical microscope would see 0.1, or less. And, the 0.1 in those days was OSHA's definition of the medical requirements of 1910, 1001. It is not listed in the regulation as far as EPA is concerned, but in their documentation -- which was then Document number 316, and which has since been changed to Document number 2.21 -- as an

in-house letter, it has been stated that 0.1 fiber per cubic centimeter would be when action should be taken. At 0.1, you must give medical checks to the workers. At 2, which was still the regulation at the time, you had to give respiratory protection to the workers.

NIOSH has also come out and said that since we don't know, it must be something as small as one fiber which will cause all of these problems. But, all of the regulations, and all of the statistics, and all of the moneys and grants that were spent to correlate all these diseases with asbestos were done at a time when we would have trouble seeing each other because the air was so cloudy. Now we are talking about clear air situations where you may have that one fiber, where with tnis 0.003 you may have the 3000, going on up to the 30,000 and at least a 0.1 with the 100,000 fibers per cubic meter.

The researchers still don't have a correlation between what the old statistics were then, which were meant to protect the manufacturer/worker — the guy who was humped over a bucket all day, or a hopper, and it was grinding up this material and spewing out all of these fibers and particles up into his face. This is who was maimed.

Bendix, in an argument regarding asbestos brakes, stated about three years ago that their line, at that point, had turned over to where less than fifty percent of their asbestos brake shoes were coming out on the passenger car. There was less than fifty percent asbestos located on the passenger car brakes. There was still some heavy equipment that had asbestos brakes.

Statistics taken in those days on the corners of New York -- Broadway and 42nd Streets, and some of the major crossroads where braking was going on — showed that there was still less fiber count than when one was driving over new road construction, where the traprock was being ground down by the dozers and the heavy equipment, grinding out the fibrous material inside. And, if Rossnagel has the statistics for that—

ASSEMBLYMAN ROCCO: So, you basically still disagree with 0.003?

MR. COHN: Well, 0.003 is a magic number for the optical microscope, depending upon which setup you have, such as the operator finding one fiber. The procedure says we will look for one hundred fibers in the P.N. Cam 239 procedure. In the new procedure for 7400, the operator still has a number of 100, and this would give him a nice, easy number to average out how many fibers there were per field, depending upon his field size. It would be in the order of 75,000 — a little bit less or a little bit more — or somewhere between 60,000 and 80,000 fields per filter. And, if he finds one fiber, so that his average would be 0.01 as he was reading it, he would come up with some number like 0.003. But, the 0.01, that one fiber, could have been in the brand new material just coming out of the filter house, unused, and that could be subtracted. Now he finds a legitimate fiber, and that fiber makes no difference if he can identify it as cellulose or glass, which is fairly common. If it looks like a fiber, if it is longer than five microns, it must be counted as a fiber, and you can't take it out by procedure.

So, 0.003 is an unrealistic number. As soon as you open that window and they are cutting grass outside--

ASSEMBLYMAN ROCCO: But, this is what the State's proposal is.

MR. COHN: The 0.003?

ASSEMBLYMAN ROCCO: Yes.

MR. COHN: The 0.05 that we have seen is a reasonable number. A contractor who can clean up a room to 0.1 can have an 05. To get to a 0.003, he would— This would be my recommendation to him as a consultant: I would tell him, "You get, in your contract, the ability to lock up that room, short-cycle your HEPA inside, and have it tested for the 0.003; and, as soon as he opened up the door, it would be less than that.

ASSEMBLYMAN ROCCO: Well, if you were writing the State proposal, what would you recommend?

MR. COHN: The State proposal?

ASSEMBLYMAN ROCCO: Yes.

MR. COHN: I would be willing to see an 0.05. Now, Minnesota spend two years taking outside statistics to see what the ambient was, and if the wind blows north one day, you get one thing; if the wind blows south that day, you get something else. If it rained three to five days before that, you may get very little to nothing for a couple of hours until the wind comes back in over the mines and brings in more fibers; or, if it is there, it will come back in over the construction and bring in more fibers. And, this is talking about legitimate asbestos fibers versus "fibers."

ASSEMBLYMAN ROCCO: Well, our purpose is to try to get information in order to help the State deal with this problem. So, if 0.003 is unrealistic in the minds of so many consultants— Well, you and Rossnagel, at least at this point, feel that it is unrealistic, and I want to know whether or not we are embarking on the wrong course, and what research came up with the 0.003 figure, because there seems to be a lot of disagreement with that figure.

MR. COHN: Many of the numbers that show up in specifications and conversations, and that are obviously quoted throughout the media, have been copy, copy, copy, seemingly with no understanding as to what that number meant in the beginning. What was it supposed to say?

The full suit, in argument -- again through the Health Department -- with the epidemiologists, is an admission that the skin is a better filter than most of the filters that can be made. Yet, all of a sudden, there is this full-suit requirement. A guy working with fiberglass has more problems with not wearing a covering than somebody working with asbestos does. Maybe it is because the glass is usually much larger in diameter than the asbestos is, and once it goes in you, you know it is there. But, the thing is, as long as there is a forceful, adequate decontamination, a man might as well be comfortable. There are temperatures taken inside work spaces during the summertime that exceed 100 degrees, for the simple reason that the sunlight comes in, stops, changes from light to heat, and has no place to go. It cooks the water almost to the boiling point, and the heat stress that is put on the workers inside is fantastic.

If you sent a worker out to the shower every half hour, you will lose him the second or third time he goes through. You have just plain washed him out. His energy has all been sent down the drain with his sweat. Yet, the contractor is going to go in there to make his buck.

The original requirement, for the contractor to be responsible to educate -- and that should have been the term used -- his workers as to the danger, so they could make an honest judgment as to whether or not they wanted to keep working, was fine. But, there is a laboring mentality. On the one hand, there was an attempt to make the contractor responsible for this laboring mentality, but, on the other hand, it has drifted to the point now where that man is to be given 32 hours of education; whereas, now, he can sleep through the six hours of the State-mandated training course -- or he was able to sleep through the six-hour training course. It wasn't meant to teach him how to take off asbestos; it was meant to tell him what the dangers were.

This was not presented to the Puerto Ricans who spoke no English, nor to the Greeks who spoke no English, nor to the Poles who spoke no English; it was conducted so that the contractor could come in and have so many men on record as having been there. He could now put them into a state job, and the men, not knowing what the dangers were, still had to go on the job. Five minutes later, they were experts on moving that scraper and dropping that material, and one of the working foremen knew how to get it off the ground, into the bags, and gone.

ASSEMBLYMAN ROCCO: Do you have anything additional to say?

MR. COHN: Yes, on the specs side: The need for the plastic in the schools, with a double layer of six mil on the floor, a single layer of four mil on the walls, and a six-mil cover over entranceways. The original intent for the six mil, in the days of not knowing how the procedures were working, was to try to protect the floor, and possibly the spaces down below, from any water or fibers that would go through, and the two mil sounded like the way to go.

The contractor who knows what he is doing will end up putting three layers on, so that his first removal will be just to take off that top layer and his gross. Then he will go through with a rough

cleaning and take his second layer off. Then, when he is getting ready for his final cleaning, he will finally strip the floor.

In the old days the contractor used to wash that floor three, four, or five times. If you ever looked through the windows — as some administrators did — you saw this "nut" in there, literally on the floor, looking for anything other than his reflection; and, you had a floor where you could bring in your lunch, drop it on the floor, lick it up, and not catch anything but the food you dropped.

But, today, with the counting requirement, we have all this plastic; we have the room sealed up and locked; and, the intent, or the practical aspect of it, has been lost. What this ends up doing, even with the electron microscope input, is to just add to the cost, with no increase in safety for the worker, nor for the building — and if the building is protected, then the people who visit the building are protected. And, these specifications don't really do that because of their copy, copy.

There was a point or two, which would come back to what has already been put through. I do believe this was put out with good intentions. I agree with Mr. Rossnagel — at least I heard part of his testimony — that there has been very little call for the expertise of anyone who is in this field.

There are people here who have been in the business since it began, who do this today to make money, or who push the facts because they "feel good" — it seems like the public, or the building owner, or the engineer, or the maintenance supervisor will understand this, not because of the facts, but they will buy it because "it sounds good to them." And, if what is being put into the specifications were looked at by somebody who understood what the intent was, and what the engineering gain would be — again, for the safety of the three levels: the worker who is removing the asbestos; the worker who is in the building for the building owner; and, what I call a civilian who happens to come in and visit — then I believe that the specifications would be tighter, due to the fact that they give the contractor a chance to do things in a way that he will learn is a better way to do it, in order to get rid of the asbestos, and not just to do it for the

money he can make from it. It would cost less because he wouldn't have to go through taking all of the listed precautions which, in some cases, don't even work for him, but which sound good.

We also offer our services. We are available to come in. We are opinionated. We have gathered statistics. We have tried some of these procedures ourselves by actually going in with the contractor, doing the work with him in order to see how it feels and whether it works, and comparing it with the air sampling we have taken. There is agreement that there is a practical way to do it, and it does not have to go to this copy, copy that has been in there. In this way, maybe New Jersey can again come back to being first. Rather than, "Boy, we have the tightest specification," maybe it could be, "We have something that works."

ASSEMBLYMAN ROCCO: That is the bottom-line. Thank you very much, Mr. Cohn.

Is there anyone else who would like to testify? (affirmative reply) Will you give us your name.

ROBERT HASIUK: My name is Robert Hasiuk. I would like to address you as a private citizen, and also as an employee of Alternative Ways, Inc., here in Haddon Heights. My position there is Director of Field Services, but prior to my employment at Alternative Ways I was a public school teacher in this State, for 13 years.

I am used at Alternative Ways to give instruction in the State Certified Abatement Worker Training Program. We were the only private concern licensed, or authorized and certified by the State, to offer that training. We are also currently training New Jersey building code inspectors for the Department of Community Affairs -- DCA. We are giving a course in abatement work, so they are familiar with it, because, as you read through the preliminary report, the State is probably going to use the DCA inspectors in some way to implement the inspection process, or the approval process, insofar as the abatement work is concerned.

One of the things the buildings inspectors have brought to my attention in our training programs is, we are addressing what is going to be done regarding asbestos in public buildings and in public

schools, essentially; and, the interim report seems to address itself solely and essentially to that problem. Some mention was made as to the possibility of their addressing private industry. In effect, the State is responsible to all of its citizens.

Mr. Rossnagel brought out the fact that there are still areas which are not legislated, and which are not inspected for asbestos exposure. As an Assembly Committee looking into areas where legislation can possibly be proposed because of the asbestos problem and how it relates to the people within this State, I would like to speak to you as a private citizen in that respect, because I can sell my house, but first I have to have a termite inspection. However, I can be loaded with asbestos in the basement, on the heating pipes, and on the heater, and, yet, nothing addresses what happens in private homes, nor in the sale or transfer of such.

Similarly, in private buildings, what happens during the potential sale or transfer of such items? There is no liability for the owner; he does not have to identify an asbestos hazard to the next owner.

The building inspectors are very concerned with the fact that they have been approving permits for renovation, demolition, etc., for many, many private facilities within their jurisdiction, and no one has necessarily identified whether or not there are going to be any asbestos materials disturbed and, therefore, create a possible health hazard to the people who are going to occupy those buildings, or work within those buildings.

Secondly, as we see it, there are still a great many heating and air conditioning firms that do commercial work on large boilers and piping insulation that may be doing less than the required 160 square feet to 180 square feet center requirements, and no notification is being made. Yet, they may be larger than that. The normal school boiler -- and I have done a lot of school surveys -- will go beyond that and a lot of these removals are being done by companies that take no precautions whatsoever insofar as asbestos exposure to themselves, the workers, or even the building occupants is concerned.

So, I think, legislatively, your Committee should also address these other areas, and similarly the construction of water systems that may contain asbestos transite pipe. These are areas that have not been looked at; they have not been legislated; and, they are areas in the public domain of great potential health hazard.

I think the building code inspectors themselves would like to see some legislation which backs them up, so that there is something on the books which says that insofar as permits for demolition or renovation are concerned, the contractors or the building owners have been certified, they have inspected for asbestos materials and none will be disturbed, or that none are contained in the buildings. I think as far as the public domain is concerned, that is something your Committee might consider looking into.

ASSEMBLYMAN ROCCO: We will certainly look into that, especially by way of legislation. We will take a close look at that. I appreciate your comments. Thank you.

Is there anyone else who would like to speak on the subject? Yes sir? Would you come forward, give your name and tell us who you are representing.

SAM SANDERS: My name is Sam Sanders. I am a private contractor and a general contractor with Bentley Contracting Company, Inc., and we are located in Philadelphia.

I am a citizen of the State of New Jersey. I am a resident of Camden County, in Pennsauken.

ASSEMBLYMAN ROCCO: I didn't understand you, sir. What was your last name?

MR. SANDERS: I am Sam Sanders.

ASSEMBLYMAN ROCCO: Sanders? You don't need the address on that do you? (speaking to hearing reporter)

HEARING REPORTER: No.

MR. SANDERS: I would like to address this from a contractor's standpoint, and also as a private citizen. Several people have pointed out here today that it seems as though nothing has been specified by the State in the legislative proposal and regulation of contractors to protect the general public, where public buildings are concerned.

The public building problem, to me, is just as great as the problem with some of the schools and government facilities throughout the State, especially the older public buildings.

One gentleman made the comment that a contractor can come in, or the building owner can come in, and actually do the removal of asbestos without being prequalified by the State, and without offering any protection to the general public as a whole.

I think the whole industry, especially where the asbestos problem is concerned, should be addressed. It should not just be addressed on the State government, municipal government, or school level. If you are going to control and regulate the schools and make sure all the government buildings are controlled and regulated, then make sure the private sector is also controlled and regulated. What good would it be to regulate and control a school building, when the kids leave the school and they go over to "John's Pizza Shop" which has a pizza oven with an asbestos pipe on it? A contractor can come in and disturb that, when it is torn out, moved, or replaced, and there is no regulation or control whatsoever over that; there was no protection offered to the general public as a whole. It will accomplish nothing if you only regulate what is owned by the government.

Also, to go back to the prequalification and training of employees and contractors who are in the asbestos business, or who do the asbestos work and asbestos removal, I would like to address one problem particularly: the cost of training and certifying these people. Who is going to pick up the cost of training these people? The contractor? The general public? If the contractor picks up the cost, then the general public is going to pick up the cost. We have to increase our cost in order to compensate for this. There should be something done. State should have a supportive body, or legislation should be proposed, to help, in a financial way, the contractor pay for the cost of training people for employment, properly training them in the way to handle the asbestos they will be dealing with in the removal process.

Also, the next problem is the state inspection system — as Mr. Cohn stated earlier -- which was overloaded this year due to the

fact that they didn't have available personnel to cover the State. I can foresee the same problem in the future. If the State does decide to pass some kind of legislation to go into the private sector, are we going to have qualified and trained people to go around and inspect in order to make sure the procedures are being followed? Are they going to be protecting the public? This is what I am more concerned with as a private citizen. What are we going to do with this legislation in order to make sure the general public is protected? This is one of the things I think should be looked at.

ASSEMBLYMAN ROCCO: Well, they are some of the things we will be working on by way of future legislation.

MR. SANDERS: Now, from a contractor's standpoint, as far as some of the methods and procedures that are being used, as far as the minimum standards and specifications proposed by the State of New Jersey are concerned, and as far as some of the specifications as written by some of the engineering consulting firms are concerned, the contractor -- or the person who is actually doing the work -- knows more and better ways, in some instances, to deal with the problem than someone who writes them on a piece of paper and then says, "This is the way it must be done," because the contractor has the experience of being there, seeing, and knowing that he does not have to vent the air through a direct source outside the building; it would be better to short-cycle it and send it back to the chamber so the machinery -- the HEPA filters and the filtration system -- can catch the fibers that are in the air.

There is just so much waste in a lot of instances, where we are being mandated by specification to do something when we have, and we know of a better way to do it. Some consideration should be given to calling in contractors and getting their opinion on ways to set up the chambers, or ways to set up the work areas themselves.

As Mr. Cohn pointed out earlier concerning the new proposed amendments to the specs dealing with the air chamber, if you use that kind of system and seal off the chamber, there is no incoming air to flush or change the air in the room. You have a totally locked-in system, and everything is "just there." The filter can't work

efficiently with no air coming in. There must be some air circulation coming into that room so that whatever is in the air can be pulled in and sucked in by that filter. It is useless to have the barriers placed so that air can't come in. Sure, the air lock system is fine as long as there is some way the air can get in, but not to allow the air to come into the room and to hold everything in just makes the asbestos stay floating in the air. How can the filter work? It just won't.

There are just a couple of other things. I could sit here for hours and hours, probably, and just talk about the various things I have seen. Some of the things have been mandated due to the specifications from engineers, and some of the consulting firms that have put in specifications as far as asbestos removal is concerned. The way they did it was totally ludicrous, insofar as some of the things we have to deal with, and some of the problems we have to deal with, are concerned.

They say, "put four mil plastic on your walls." Once you are there, you clean and leave -- you make your air monitoring tests, etc. What is the purpose of putting the four mil plastic on the walls if you are going to open the windows -- as the gentleman said earlier -- and let the air right back into the room? Half of what you tried to clean up and get rid of is going to blow right back through the windows. What is the purpose of it? It is just going to be an additional cost to the contractor. The walls have to be wet-wiped and vacuumed.

ASSEMBLYMAN ROCCO: Well, as a contractor are you in contact with an engineer all the time? I mean, do you discuss these things with the engineering people?

MR. SANDERS: Yes, we do discuss these points with various engineering people, but the engineering people say, "This is the minimum specification; this is that the specs say you must do." So, what choice do you have?

ASSEMBLYMAN ROCCO: Well, of course, that is the reason for having these hearings around the State, so we get input, not only from engineers but from contractors also. If there are various ways which you perceive will help the situation, then that is the kind of information we need.

MR. SANDERS: Well, I will be more than glad to sit down and write up any kind of proposal or ways in which I think--

ASSEMBLYMAN ROCCO: That would be great. If you would do that, just give it to me or to any member of our Committee and we will make sure it gets into the record and is looked at as a concern.

MR. SANDERS: I will definitely do that, sir. I thank you for the opportunity to address the Committee.

ASSEMBLYMAN ROCCO: Thank you, Sam, I appreciate it. You are the only contractor we have had here today, and I think it is important to have your kind of input.

Is there anyone else who wishes to speak on the topic? (no response) If not, we will now conclude the hearing.

(Hearing Concluded)

APPENDIX

STATEMENT OF

THE HONORABLE JAMES J. FLORIO, CHAIRMAN

SUBCOMMITTEE ON COMMERCE, TRANSPORTATION AND TOURISM

ON

THE FEDERAL GOVERNMENT'S FAILURE TO CONTROL ASBESTOS HAZARDS

BEFORE THE

ASSEMBLY SPECIAL COMMITTEE ON ASBESTOS HAZARDS

NOVEMBER 14, 1984

HADDON HEIGHTS, NEW JERSEY

Mr. Chairman and members of the Committee, I am pleased to be with you today to discuss my perspective on the federal government's failure to respond to the public health emergency created by recent discoveries of widespread asbestos contamination in our schools and public buildings.

As you know, I chair the United States House of Representatives Subcommittee which has oversight responsibility for the federal Environmental Protection Agency's Asbestos-in-Schools program. Some weeks ago, before the Congress adjourned, I held a hearing on the status of EPA's efforts to cope with this growing environmental crisis.

Unfortunately, the overwhelming conclusion which came out of that hearing was that the federal government's response to asbestos hazards has been totally inadequate.

As members of the Committee are undoubtedly aware, the only existing federal asbestos exposure standard was put out by the Occupational Safety and Health Administration (OSHA) and is two fibers per milliliter. The standard has been widely criticized and OSHA is currently considering proposals to tighten it up considerably. Between 1940 and 1980, over 27 million workers were exposed to asbestos. Mount Sinai researchers estimate that from 1980 onward, there will be 350,000 premature deaths as a result of this exposure.

As for the problem of asbestos in the schools, awareness of the current public health emergency was prompted by an EPA rule issued in 1982 which requires all schools to inspect for asbestos hazards and post a public notice if they are found. The deadline for compliance was June 1983. It is estimated that 15 million school children and 1.4 million school employees work in buildings contaminated by friable asbestos nationwide.

The EPA poses the ultimate "Catch 22" for school administrators because the agency has never put out clear standards or adequate guidelines concerning how to deal with this pressing environmental problem. Thus, school officials are supposed to inspect without knowing what they are looking for, disclose the existence of a hazard when and if they find it, and abate the hazard without knowing how to do so.

School districts across the country are in a total panic, without the expertise, resources or the funding to deal with the problem. EPA has not even initiated a program to certify contractors for removal work. The result is that disreputable outfits may be getting in on this lucrative business and we have heard reports that asbestos materials removed from the schools are being flushed down public toilets or hauled in plastic bags to municipal garbage dumps. Such negligent disposal activities only make a bad situation worse.

As for the issue of providing funding for necessary remedial work, in New Jersey alone, for example, it is estimated that it will cost $50-70 million to completely abate the asbestos hazard in our schools.

This past August, Congress attempted to provide some assistance to local school districts by authorizing a $600 million loan program for asbestos abatement efforts. But EPA and the Administration opposed even these minimal efforts. In the hearing I held in Washington a few weeks ago, the top EPA official in charge of the asbestos program announced that the agency would oppose funding for the loan program in fiscal year 1986. The agency attempted to retract this startling admission the next day in a statement the Washington Post described as an effort to contain a "public relations nightmare." But the statement did not promise to seek funding and said that the Administration had not yet made a decision on the issue.

What is EPA's rationale for opposing the loan program? The agency claims it would be wrong to give school districts the illusion that they can get government help -- unless local officials are forced to bite the bullet and deal with the problem totally on their own, we may never solve it. This kind of reasoning is sort of like refusing to give aid to underdeveloped countries on the grounds that it will make them soft and unable to proceed on their own.

I am not satisfied with EPA's totally inadequate efforts to date to deal with this growing public health emergency and I intend to pursue the issue when the Congress returns this January. Legislation may well be needed to force the federal government to do its job.

In the meantime, Committees like this one in state legislatures across the country are being compelled to come to grips with the unfortunate reality that no relief may be in sight at the federal level. Unless the states act, the current intolerable situation in our nation's schools may well prevail indefinitely. I commend your efforts to ensure that this important problem is given adequate attention at the state level and look forward to working with you in the months ahead.

TESTIMONY SUBMITTED

to the

ASSEMBLY SPECIAL COMMITTEE ON ASBESTOS HAZARDS

by

Thomas A. Burke, Director
Office of Science and Research
New Jersey Department of Environmental Protection

14 November 1984

On behalf of the New Jersey Department of Environmental Protection, I would like to thank the Assembly Special Committee on Asbestos Hazards for this opportunity to testify on the problem of asbestos in public buildings.

I have reviewed the Governor's Asbestos Policy Committee's Interim Report and fully support the recommendations made by the Committee for addressing asbestos hazards in New Jersey. Based on current scientific expertise, they have developed a practical and comprehensive strategy for the assessment and remediation of asbestos hazards in buildings. They have proposed an action guideline for asbestos in air which is far more stringent than the current Occupational Safety and Health Administration (OSHA) workplace standard. They have proposed significant revisions to the current "minimum specifications for Asbestos Removal" and expansion of the "Basic Asbestos Safety Training Course." They have also recommended addressing the problem of exposure to asbestos in drinking water; currently there are no regulations in this area. I commend their efforts.

Since 1976, when the discovery of asbestos in Howell Township schools was considered a significant potential health threat to children, the State of New Jersey has taken substantial steps to assess and develop solutions to the problem of public exposure to asbestos. Efforts by the State's Asbestos Task Forces have resulted in guidance documents and policy statement initiatives reflecting current and accepted opinions on asbestos management and control. By successfully petitioning the U.S. Environmental Protection Agency, New Jersey has significantly influenced national asbestos control policies in the areas of building construction and removal from school buildings. In addition, many millions of dollars have been expended by the State and its municipalities to remove asbestos from schools and thereby reduce health hazards to children, a potentially sensitive population. In

parallel with the activities carried out by other state departments, the Department of Environmental Protection (DEP) is continuing to develop appropriate and effective strategies for minimizing environmental contamination and public exposure to environmental sources of asbestos.

The Department of Environmental Protection is primarily responsible for monitoring and regulating the occurrence of excessive asbestos contamination in various environmental media, primarily air, potable water supplies, and land.

AIR

Because the health hazards associated with the inhalation of asbestos fibers are well-defined, regulations controlling asbestos content in air were promulgated early by the federal government. In 1973, a regulation under the Clean Air Act (U.S. CFR 40, Part 61, Subparts A and B) provided that no visible emission of asbestos would be permitted to the outside air from asbestos mills, various manufacturing and fabricating establishments using asbestos, asbestos spraying operations, and friable asbestos-containing demolition and renovation sites. In 1976, the Federal Occupational Safety and Health Administration issued the current regulation for asbestos in workplace air with a standard of 2 fibers (over 5 microns in length) per cubic centimeter of air. In 1977, New Jersey DEP further regulated the release of asbestos to ambient air by promulgating Subchapter 17, Control of Prohibition of Air Pollution by Toxic Substances, which expressly prohibits the spraying of asbestos coatings or friable material containing in excess of 0.25 percent by weight of asbestos.

DEP has not yet established an asbestos air monitoring network due to the lack of proper instrumentation for analyzing samples. This situation should soon be remedied when the state Department of Health acquires a transmission electron microscope; this equipment is considered essential for accurate and

representatives measurements. Informed policy decisions to protect public health requires that DEP establish an effective air monitoring program. A literature search was conducted by the Office of Science and Research to evaluate the release of asbestos to ambient air in New Jersey from the use of brakes in light motor vehicles. It was determined that this single source category released between 200 and 300 kilograms of asbestos to the atmosphere during the year of the study. This signigicant quantity, generated by one of a number of potential souces, clearly indicates the need to establish an air monitoring network for asbestos in New Jersey.

POTABLE WATER

Although a positive correlation between the ingestion of asbestos fibers and deleterious health effects has not yet been established, DEP contends that the dangers from inhalation are considerable enough to warrant a conservative approach to the ingestion hazard. Consequently, the Department is focusing attention on asbestos in drinking water.

In New Jersey, there are three possible sources for the occurrence of asbestos in drinking water. 1) Many public water supply pipes are made of cement reinforced with asbestos. The higher the acidity of the water, the greater the potential for erosion of these pipes and the subsequent leaching of asbestos into the water supply. 2) Northern New Jersey has extensive natural formation of asbestos-bearing rock. Naturally occurring fibers may work their way into the water supply. 3) Finally, asbestos fibers may reach potable water suplies from industrial sources and mismanaged wastes. New Jersey has, in the past, had an extensive asbestos industry.

Currently, there are no standards, either federal or state, regulating asbestos levels in drinking water. EPA Region II conducted a 1981 study sampling 56 public water supplies in New Jersey for the occurrence of asbestos and found levels ranging from zero fibers per liter to over 50 million fibers per

liter. DEP's Bureau of Potable Water is now conducting a survey of over 500 public water purveyors to determine the amount of asbestos/cement pipe used in New Jersey for delivering potable water. The Governor's Asbestos Policy Committee has recommended that asbestos/cement piping no longer be used to build new public water supply systems.

DEP's Office of Science and Research is reviewing hazardous substances to be included for regulation under the new A-280 amendments to New Jersey's Safe Drinking Water Act. Asbestos is being considered as a possible candidate for regulation.

WASTE DISPOSAL

DEP's Division of Waste Management is responsible for regulating and enforcing the disposal of asbestos wastes. Twenty four landfills in New Jersey accept asbestos wastes which must be handled according to strict regulations. Currently, regulations for disposal of asbestos are in the process of being amended with stricter controls for handling wastes.

Assembly Bill 1820 has recently been signed by the Governor and concerns the application, removal, and encapsulation of asbestos. DEP's scientific expertise will assist in developing standards and regulations to properly enforce the Act.

Aware of its historical widespread use, its pervasiveness in our environment, and the potential for serious health consequences, the New Jersey Department of Environmenal Protection will continue to identify, assess, and mitigate public exposure to asbestos and asbestos-contaminated materials. Although gaps in our present knowledge result in scientific uncertainties, protection of public health and welfare justify taking a cautious and prudent approach with a well-established hazardous substance.

Alternative Ways Inc. - ENVIRONMENTAL DIVISION

Wisdom in Finding Alternatives.

COMMENTS ON THE ASBESTOS POLICY

COMMITTEE'S INTERIM REPORT TO THE GOVERNOR

1) The law requires that owners of public buildings, such as School Boards and State and local agencies, conduct all contract work under bidding requirements that restrict awards to the low qualified bidder. In the first place, it is my opinion that the removal of a known human carcinogen from buildings which house children nine months out of the year by a low bidder is ludicrous at best. Any State policy based on the premise is doomed to failure.

2) If the building owners must award contracts to the low qualified bidder, we must determine what is meant by, and how do we select a qualified firm. At present, the State prequalifies contractors under a limited number of parameters. As I understand it, (in the past) in order to qualify a contractor must be able to demonstrate that he/she has bonding, insurance, a financial statement, has a representative of the firm attend a one day seminar conducted by the State, and is breathing at the time of application. As such, no matter how bad a reputation a contractor may have for accomplishing projects, how bad a job they did on the last project in the same School District, or how ridiculously low their bid is; that contractor can hold up his/her prequalification certifcate and even get an injunction against the project if his/her bid is not accepted. At present, under the new prequalification program, several firms have been prequalified that have been thrown off of projects or are being sued by the State for improper removal. At the very least, do <u>not</u> make prequalification by the State binding on other public agencies.

3) In the past, there has been no mechanism for disbarring any contractor from this approved list for any reason relative to their performance or ability to perform asbestos removal adequately. This has left contractors, who have demonstrated time and time again total inability to adequately perform asbestos removal, the right to bid and be awarded projects. Although I understand that this mechanism has now been put into place and that the procedure is beginning to be utilized, I still see many loopholes for adequately protecting building owners. One major point is that a contractor disbarred as XYZ company can literally open for business the next day and receive prequalification as the ABC company. Furthermore, there will be great disagreement as to what rules were broken and how bad is bad.

300 WHITE HORSE PIKE
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(After Hours)

4) As a result of rather extensive media coverage, the asbestos issue has become a very emotional topic to say the least. The emotionalism, in conjunction with EPA's requirement to inspect schools, has forced great movement to remove asbestos as soon as possible. School District in particular are spending millions of dollars to remove sound asbestos materials. Many times this has occurred in a rushed and dangerous fashion. Foremost in the State's policy should be a program to adequately inform the public on the hazards and realities of the asbestos problem. Hysterical and emotional responses are not the forum for informed decision making.

5) Since the EPA's requirement to inspect and notify was not followed by adequate regulations regarding its abatement and since both of the major regulatory agencies OSHA and EPA will admit that their regulations regarding asbestos abatement are totally inadequate, asbestos abatement is taking place in a giant void between demand for its removal, and appropriate and necessary regulations. As such, there is practically no enforcement power whatsoever to ensure these projects are accomplished in an appropriate and safe manner.

6) The State has a minimum specification for asbestos removal which traditionally has fallen short of state of the art techniques. Even so, failure by a contractor to adequately conform to this minimum State specification in no way means that he/she has violated any laws. As such, there is very little enforcement power by the State of this minimum specification. Failure of the contractor to accomplish the project in a safe manner is a violation of a contract and as such, becomes a contract dispute. No laws are necessarily broken. With the new asbestos policy, a more stringent specification is proposed. However, unless this specification is backed by State legislation making it law, violations will continue to be contract disputes with very little enforcement power.

7) Training of workers is essential. However, the State must recognize the education level of many of these workers. We feel that a policy of three (3) levels of licenses based on job function is best. These would be:

   a) An extensive training and certification program of all job function, laws, etc. for job foreman and supervisors. A certified foreman would be required at each job site, present all day, every day.

   b) An extensive training and certification for individuals responsible for setting up containment systems, negative pressure, decontamination facilities, etc.

c) A detailed course on the hazards of asbestos, personal protection, respirator, decontamination, etc. for the labors who only remove once the environmental safeguards are in place.

8) Any program which allows a contractor to become certified to train his/her own people will surely fail. This has never worked in the past. Many workers are hired the night before the job in a bar with no training.

9) Calling for a certified industrial hygienist as part of the laboratory requirements seems like a good idea on the surface yet there are problems. A CIH is just that a Certified Industrial Hygienist. They have a great deal of training on a wide variety of industrial related hazards. However, I believe the typical training for a CIH includes a one-half hour lecture on asbestos and this is related to industrial hazards. We are talking school children and the general public. Certainly there are highly qualified people in the field who are not industrial hygienists. In fact, most of the recognized authorities on the subject of asbestos in the nation's buildings are not CIHs. Would you preclude Dr. Silicoft from starting a laboratory in New Jersey? Certainly there must be a mechanism for qualifying other experts.

10) Of major concern is renovation and demolition work. Unknowningly, thousands of workers and the public are being exposed because no one knows the building being renovated or demolished had asbestos. It should be a requirment in the State that no building permit be issued for major renovation or demolition until an asbestos survey has been conducted in the building.

These are just a few of the major points that effect the safety and health of those exposed to asbestos. However, there are numerous other points that must be addressed with this report. These detailed debates do not lend themselves to the public hearing/testimony type of approach. I would suggest that a panel of experts in the field representing contractors, air monitoring firms, consultants, architects, engineers, etc. be given the opportunity to discuss and debate these detailed issues with the Asbestos Policy Committee.

Brian L. Bramell
Alternative Ways, Inc.
Environmental Division
November 14, 1984

TESTIMONY FOR
ASSEMBLY SPECIAL COMMITTEE ON ASBESTOS HAZARDS
HADDON HEIGHTS, NEW JERSEY
NOVEMBER 14, 1984

My name is David Lummis, I am an architect with Kolbe and Poponi/Architects and Planners of Cherry Hill, New Jersey. I have been associated with the firm since 1979 and have been a registered architect since 1982. Last August, I attended a two day symposium on Asbestos Project Management in Washington, D.C. sponsored by the National Association of Asbestos Abatement Contractors which dealt with all aspects of the dangers and necessary corrective action of the asbestos problem. We have prepared plans and specifications and administered the construction contract for four (4) projects. These include: The Camden Home for Children, Lower Alloways Creek Township Elementary School, Penns Grove Schools and the Camden County Vocational and Technical Schools, which has not yet gone out to bid. We also prepared plans and specifications for asbestos removal work at the U.S. Naval Reserve Center in Poughkeepsie, New York, but we were not involved with the contract administration. Our four (4) New Jersey located projects have been prepared based on the New Jersey Minimal Specifications for asbestos removal. However, with each we do, we feel there is a need for greater protection for the public and the asbestos removal workers, and we revise our specifications accordingly.

The minimal specifications currently require the concentration of asbestos fibers after the final clean-up not be exceed .1 fibers per cubic centimeter based on an air sample of not less than 240 liters. The Asbestos Abatement Industry currently recommends a level of .01 fibers per cubic centimeter based on an 960 liter air sample. Levels for below this would be hard to obtain, even by a competant contractor, because there are asbestos fibers in the air all around us in everyday exposure. Because of this, reducing the permissable concentration below .01 fibers/cc does not necessarily provide greater public safety.

A recent change in the minimal specifications permits the testing laboratory to be hired by the contractor. I do not understand the reasoning behind this change and I believe there is a definite conflict of interest as the testing laboratory must protect the Owner's interest by making certain that the contractor does not expose the environment or the workers to higher levels of asbestos fibers than what is specified.

All of ~~the~~ asbestos removal work that has been bid has been awarded to the low bidder. We have been fortunate in that all of these contractors did a very good job. But now that asbestos removal has become such a booming business, more and more contractors are getting involved with this type of work. In public work, where the contract must be awarded to the low bidder; and in private work, where owners are attracted to the idea of saving money, the basis of awarding the contract is not necessarily based on the competancy of the contractor. Performing an asbestos removal job with an incompetant contractor often poses more of an exposure problem than if no work were done at all. The prequalification of contractors must be studied thoroughly so that the incompetant contractors are weeded out, or the owners in public work must be able to accept the bid of a competant contractor, though he is not the low bidder.

Asbestos removal work performed in schools over this past summer throughout the State received much attention from the media. The general impression of this coverage was that the asbestos removal work was sloppily done and would create an exposure problem to the children forcing the schools to delay their opening. Our project for the Penns Grove Schools was listed as one of those schools who did not receive final approval from the Department of Education. This created alot of concern from the parents in the school district, even though the work had been completed with final air testing results showing fiber concentrations far below the specified levels. The problem was the Department of Education was so backed up with other projects also requiring inspection, that many schools did not get their final approval. The media focused on the few cases where work was done improperly and failed to clarify that these problems did not apply to all schools on this list. While it is proven that asbestos exposure is a serious health problem, the media had magnified the problem creating unwarranted public anxiety.

The asbestos problem is a serious health hazard because there is no apparent safe exposure limit. The industry has the knowledge and the means to remove this threat where it is found, but it will never be totally eliminated. It is necessary to either remove the asbestos or to otherwise contain the release of fibers so that exposure and its related health problems are minimized. The minimal specifications should be reviewed and changed where necessary as more and more asbestos removal projects are performed. Removal techniques and equipment are constantly being improved and these should be reflected in the specifications.

ASBESTOS TESTIMONY

on the

PUBLIC HEARINGS ON

ASSEMBLY RESOLUTION NO. 75 ON ASBESTOS

held in the

MUNICIPAL BUILDING

HADDON HEIGHTS, NJ

presented by

W. B. Rossnagel, P.E.

President

ROSSNAGEL & ASSOCIATES

MEDFORD, NJ

on

November 14, 1984

ROSSNAGEL & ASSOCIATES

Engineering & Testing Consultants

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INTRODUCTION

My purpose in presenting this talk to you today is to tell you both sides of the asbestos problem. I report it to you as a test engineer who has direct experience in all aspects of asbestos contamination for over 14 years--and on some aspects of it I go back 25 years.

I ask that you listen very carefully--as I will be most candid in presenting an objective and fact-based review of this most controversial issue. I really need 3 hours to fully cover this subject--but I will condense it for you at this session.

Yes--there are many horror stories of men and women dying from asbestos diseases. The 3 asbestos related diseases are asbestosis (similar to emphysema), lung cancer and the dreaded (and almost always fatal) mesothelioma. Yes, about 2,000 people (at least 98% men) will die of asbestos caused diseases each year for the rest of this century. None of these deaths should have occurred. Those of you who have seen the TV shows on the victims of mesothelioma should realize the tragedy to those victims and their loved ones. To those of us who have known victims of mesothelioma who have later died, the impact of this problem is also very close and personal. Asbestos is an American Tragedy. I have made 3 thirty minute audio/visual slide shows which delineate, in Part I, the history (and horror stories and coverup stories by the manufacturers of asbestos); in Part II the problems confronting school boards in making decisions (including gross inaction by our government); and in Part III the controversy in test methods (with misleading information and bureaucratic jealousies causing so much confusion) of airborne/bulk asbestos tests.

However, of all the victims of mesothelioma, over 98% have been people who worked in asbestos mines, factories, brake shops, or in related construction, insulation, boilermakers, etc. jobs. Some worked only a few weeks; in a few cases only a couple of days--but they were exposed to high levels of airborne asbestos dust and fibers. Another group of men and women became victims because they either washed the clothes of their husbands or they lived downwind of the asbestos mine or plant--or even were hairdressers to women who worked in asbestos operations.

Beginning in 1970 with "Earth Day," our country became more aware of environmental and health problems. Our government also created O.S.H.A. (Occupational Safety & Health Administration) to reduce work place hazards--and asbestos was one of the first 3 major contaminants on which O.S.H.A. began its enforcement work and set the allowable limits in 1972.

However, there now is a major concern over asbestos in our schools, colleges, work places--and even homes. Before we get to the numbers that will clarify this confusion, I want to make the following points:

1) We must be able to separate the high percentage of deaths reported by the experts like Dr. I. Selikoff of Mt. Sinai Hospital. Their data shows up to 60% and even higher percentages of asbestos workers

(and in some cases their wives and downwind residents of the plant) were struck down by the dreaded mesothelioma. This is true--but to compare the exposure those persons had with the exposure in schools is not proper. Yes--many schools needed to have the asbestos removed. Our firm alone in 1983 recommended $6 million in needed removal work....but perhaps 1/2 of all the removal projects are an over-reaction to the wishes of a small but highly vocal minority at the school board meetings.

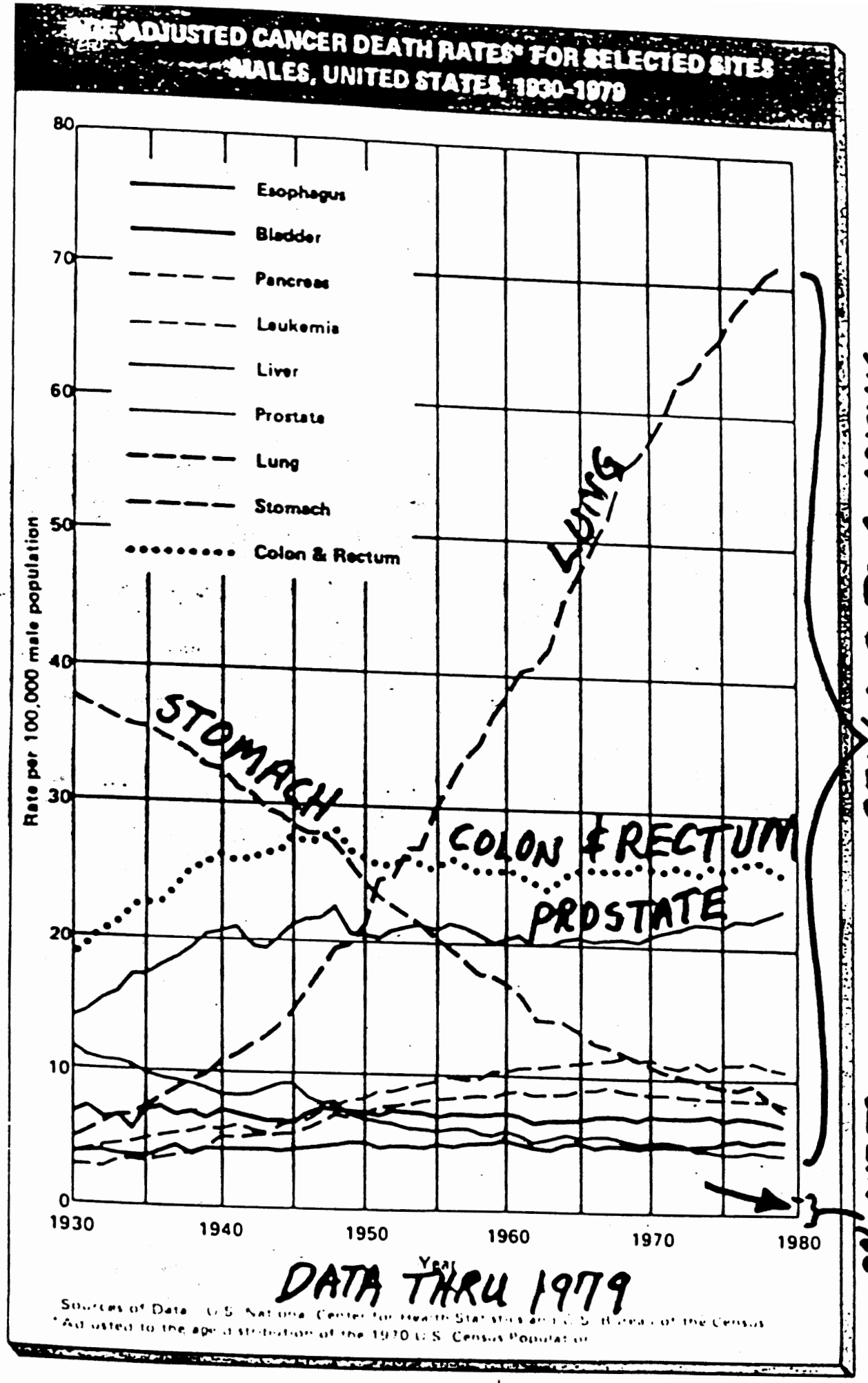
2) Now let's take a look at the percentage of lung deaths from asbestos as compared to other causes. Page 4 shows the latest data, from the U.S. National Center for Health Statistics, for "Male Cancer Rate Deaths." This latest data is for 1979--because it takes 5 years for all the data to be assimilated from hospitals, morgues, death certificates, etc. This shows the causes of all male cancers is either the same or decreasing except for LUNG CANCER. Lung cancer began a dramatic rise in 1935, about 15-20 years after the increase in smoking during WWI. The rate for 1979 was 71 out of every 100,000 male deaths. Note the rate for women was 20 out of every 100,000 female deaths for the same year. The death rate for women began its steep rise in 1965, about 20-25 years after WWII. However, all the male deaths from asbestos caused diseases, including mesothelioma, are represented by the arrow at the lower right of the graph on Page 4. This is only about 2% of all the male lung cancer deaths--and it includes the approximately 2,000 men a year who die of mesothelioma and lung cancer. The total number of persons claiming injury or death due to asbestos in schools, colleges, etc. is less than 2 dozen.... not 2 dozen a year, but 2 dozen in total.

WHAT YOU SHOULD REALIZE IS THAT MOST OF THE OTHER DEATHS, AT LEAST 95%, ARE CAUSED BY SMOKING. The subtle objective question is--are we as a nation over-reacting to a 2% asbestos caused lung problem and ignoring a 95% smoking-caused lung problem.

Now to another vital statistic. In the 7 years since the famous Howell Township (NJ) School Asbestos problem, there have been less than 2 dozen men and women in the entire country who have claimed their lung disease was traceable to an asbestos exposure in schools, colleges or universities.

Available also by request is my article "THE REAL STORY ON ASBESTOS." I have attached the 5 points in my May 7, 1984 testimony before the USEPA Asbestos Hearing in Washington, DC for review.

Please review this testimony very carefully--because it presents the asbestos exposure data in a different manner than you may have seen before. Up to now the medical doctors, industrial hygienists and pathologists, engineers, etc. have presented the airborne asbestos concentrations in fibers/milliliter or fibers/cubic centimeter. In that system an airborne asbestos level of, say .003 fibers/milliliter, was considered a very low number. A .003 is pretty close to zero....and the public thought a level of very near zero (or even zero) in airborne asbestos fibers was possible--and desirable and achievable. The attached testimony shows how those units have given the public an entirely wrong conception of the airborne asbestos problem. Please follow my testimony at the May, 1984 Washington hearings beginning after Page 13.


AGE-ADJUSTED CANCER DEATH RATES* FOR SELECTED SITES
MALES, UNITED STATES, 1930-1979
Esophagus
Bladder
Pancreas
Leukemia
Liver
Prostate
Lung
Stomach
Colon & Rectum
Rate per 100,000 male population
80
70
60
50
40
30
20
10
0
1930
1940
1950
1960
1970
1980
Year
LUNG
STOMACH
COLON & RECTUM
PROSTATE
95% DUE TO SMOKING
2% DUE TO ASBESTOS
DATA THRU 1979
Sources of Data: U.S. National Center for Health Statistics and U.S. Bureau of the Census
*Adjusted to the age distribution of the 1970 U.S. Census Population

My general comments on the ASBESTOS POLICY COMMITTEE'S INTERIM REPORT are as follows:

A) The Asbestos Policy Committee has done a poor job in preparing this report. It took 9 months to turn out a report which was dated "Sept. 1984" but not made available to most people until "mid Oct. 1984"....and contains many wrong decisions.

B) The Asbestos Policy Committee let the governor down by not following his mandate that the committee integrate its work with industry, removal contractors and consultants. I hear that only 4 of the 35 members who prepared this document have ever been "suited up" inside an asbestos contaminated room during a removal project. They got no inputs from persons outside the N.J. state departments. The USEPA asked me to give testimony at the USEPA Asbestos Hearings last May 7th....but the N.J. Asbestos Policy Committee never thought to ask for my inputs before releasing this document. There are other asbestos experts that they did not consult. That shows an incredible lack of direction by the head of the Policy Committee.

I find the following specific errors in the Asbestos Policy Committee Interim Report:

1) The level of 100 nanograms per cubic meter is too low . It is below the average of normal outdoor ambient levels of asbestos shown in our company tests over a 7-year period.

2) It was based on an EPA study in which the ambient levels were checked in a very pristine and unidentified location. It is too low for any industrial area or heavily trafficked area.

3) It is based on a measurement of T.E.M. (Transmission Electron Microscopy) on which less than 1/10,000th of 1% of all airborne tests have been done to date. Our firm, for example, has done over 9,000 P.C.M. tests, over 100 for S.E.M. and none for T.E.M.

4) There has not been a single governmental agency which has prepared a detail process specification or established accept/reject criteria for T.E.M. in the 8 years it has been used on asbestos. One thing court experience tells us is not to use a test method that does not have well written and accepted test and analysis procedures. The NIOSH limits do not apply to T.E.M.

5) There are only 2 T.E.M. instruments in N.J. in commercial labs. The State Health Department does not even have one. They cost over $450,000 and take up to a half-year to de-bug and train the operator.

6) If all the N.J. school final airborne tests are done by T.E.M., the time to analyze samples could be 4-8 weeks in the end of August when maybe 100-300 schools will each have 10 to 75 or more samples waiting to be analyzed. The log jam will be hundreds or thousands of times worse than it was this August when only a few hundred samples were submitted to the easier S.E.M. analysis.

7) The cost of T.E.M. is 50% more than S.E.M. and 1,000% more than P.C.M.--and remember, the T.E.M. method on asbestos has not been tested in court yet on asbestos concentrations. Hundreds of cases have gone to court with P.C.M. data--and court decisions are the bottom line in our enforcement system.

8) There is no technical data to back the 100 nanogram per cubic meter value. I said previously in Item 1 that it was too low a value.....and the criteria selected was made without proper technical investigation. An opposing attorney would "destroy" the inadequate investigation that went into the way the Asbestos Policy Committee arbitrarily selected this method and this low limit.

9) In the T.E.M. analysis there is a final calculation in which it is assumed there is an average of 30-33 asbestos fibers per nanogram. This averaging of the results eliminates much of the advantage of the S.E.M. in which the actual fiber size and type can be seen. Certainly we do not want to put <u>into the final calculation</u> an "averaging" which can distort the effects of the larger and thinner and smaller fibers. Remember, a lot of people have drowned in water that was an <u>average</u> of 3-feet deep.

9.1) T.E.M. requires "ashing" of the sample which destroys a major part of the sample.

20x

Now, to comments on the proposed organization:

10) The organization chart on Page 17 of the Asbestos Policy Report shows the Health Department would be overall in charge. That is as it should be--but my critical comments in this testimony show that the Health Department must know when to go for outside help.

11) We deal with about a dozen state agencies every month--but the N.J. Health Department has the worst record in returning phone calls. The higher up in the department, the worse it gets..... so it is a policy that should be corrected in the next top and middle manager staff meeting.

12) The key responsibility for the:

- construction permits
- monitor removal
- certificate of occupancy

is allocated to the Dept. of Community Affairs. We hope they will ask the consulting engineers and architects who submit the plans, specs and drawings for comments on how the system can be made to work better than it did in 1984.

13) We also need instruction NOW as to how the removal approval procedure is to work because many of us are planning for Christmas and winter vacation removal work.

14) Page 26 totally ignores the P.C.M. testing done by ROSSNAGEL & ASSOCIATES alone in over 300 N.J. schools. The P.C.M. data (if properly done) is good--and should not be discarded for the more costly (10 times more), unproven in court and unaccepted by any governmental agency T.E.M. test method.

15) Page 11, Item J, should state decontamination chamber instead of documentation chamber.

16) Page 15 should state the Owner's Professional Engineer/Architect shall participate in the inspection.

17) Page 16, Item A 5, should state "--written emergency and fire evacuation procedures from the Work Area and post them."

18) Page 18 should allow a single thickness of 6 mil polyethylene film on stairs to reduce accidents. This is critical.

19) Page 19, Item B, should allow 1 or 2 person teams. This is critical--because it is mostly done by single workers.

20) Page 22, Item 2 b, does not specify how soon after the air monitoring tests are made that the results must be submitted.

21) Page 23, Item 2, leaves out the CRITICAL AND ALL IMPORTANT VISUAL INSPECTION. Most state education department inspectors and ROSSNAGEL & ASSOCIATES agree that the final visual inspection counts 50% to 75% of the final acceptance decision.

22) Page 25 should state "Certificate of Compliance" instead of "Certificate of Acceptance." It should also state that it will first be submitted by a legally responsible officer of the removal firm and then endorsed by the Professional Engineer/ Architect. This could have been noted from our specifications.

23) The state must provide a large wall control chart to plan, supervise and show the current status of 200-400 asbestos removal projects. They should never again be allowed to bunch up so much in August that proper inspections, testing and analysis time, reclean-ing, cleaning and re-inspections and re-testing and re-analyzing time cannot be accommodated.

24) Of course, the training program must be improved--but it should be able to be done in 2 eight hour days with a written test each day.

25) Of course, provision must be made to eliminate the bad low bid contractors.

25.1) These requirements should be made a part of the New Jersey Building Code.

PROPOSED MONITORING SPECIFICATION

26) Page 1 should state in Item 3 "a graduate of the McCrone Institute Microscopy Course."

27) Page 1 should also state in Item 4 that "Testing must be done by an independent lab, not associated with on any fee basis or owned in whole or part by the removal contractor or managed by a relative of the removal contractor."

28) Page 2 should put the word "Independent" in front of every use of the work "Testing Laboratory" or so footnote it to the same effect.

29) Page 2, Part II A, states adverse results shall be reported and highlighted "immediately." The word "immediately" is too vague--it should state "ASAP but not later than 1 working day" and specify who is to be notified.

30) Page 3, third line from the top, is a misuse of the word "continuous." Do you mean air monitoring is to be done every hour in every room? Continuously means <u>all the time</u>--so define it better.

31) We have still more comments--because the persons who prepared the ASBESTOS POLICY REPORT apparently have not reviewed some of the better specifications submitted for this work. They should do same and see the many key points which have been missed in this document.

32) FINALLY, ROSSNAGEL & ASSOCIATES HAS PREPARED A MATRIX ON THE FOLLOWING 2 PAGES OF THE STATE'S PROPOSED AIR MONITORING PLAN AND ROSSNAGEL & ASSOCIATES' ALTERNATIVE PLAN, WHICH IS:

- More effective
- Half the cost
- Faster
- Should eliminate log jam in August
- More accurate
- Uses proven technology
- Please Consider It

Please review Pages 11 and 12 for a real comparision of the state's proposed air monitoring method and the ROSSNAGEL & ASSOCIATES' proposed method. Please note the new proposed allowable limits on Page 12.

33) On Page 11 the arrow has been drawn to the word "Max." It was meant to be "Minimum."

NEW JERSEY ASBESTOS POLICY (Committee's Interim Report to the Governor)

STATE PROPOSED AIR MONITORING PLAN

Type of Test	Before Removal	During Removal	After Removal But Barrier in Place	After Final Cleanup and Barrier Removal
PCM	--	OSHA 1910.1001 (f) For 8 hr.TWA & ceiling concentrations. Max. of 3 samples not in work area ② *	1 composite sample/10,000 sq. ft., .05 f/cc limit 960 L. Microscope Field Area ≤.003 mm^3 ③	--
SEM	--	--	--	--
TEM	In Breathing Zone. 2 LPM 960 L. Minimum 1 sample/10,000 sq.ft. of work area ①	--	--	In Breathing Zone. 2 LPM 960 L, Minimum 1 sample/10,000 sq.ft. of work 100 ng/m^3 limit simulated occupancy ②
On-site Direct Reading △	Not Required	Not Required	Not Required	Not Required
Smoke Test for Neg. Press.	Not Required	Daily	Not Required	Not Required
Visual Inspection	Yes	Yes	Yes	Yes

PCM: Phase Contrast Microscopy NIOSH Method #7400
SEM: Scanning Electron Microscopy
TEM: Transmission Electron Microscopy
△: On-site Light Scattering Direct Reading Particle & Fiber Counting Instrument (such as GCA Model RAM-1 Instrument)

① Results in 5 Working Days
② Results in 3 Working Days
③ Results in 24 Hours

Simulated Occupancy means: Fans operating/HVAC in operation or other appropriate measures.

* 1 Sample At Decontamination Unit
2 Composite Samples in Assorted Rooms Adjacent to Work Area

Form #RA-778B

24 X

NEW JERSEY ASBESTOS POLICY (Committee's Interim Report to the Governor)

ROSSNAGEL & ASSOCIATES' PROPOSED AIR MONITORING PLAN - To Replace State Plan

Type of Test	Before Removal	During Removal	After Removal But Barrier in Place	After Final Cleanup and Barrier Removal
PCM ④	At nose height, 2 LPM 240 or 960 L., Min. 1 sample/10,000 sq. ft. of work area. This is baseline test 2	OSHA 1910.1001 (f) For 8 hr. TWA concentration determination. Min. of 2 samples in work area plus see → * ③	1 composite sample/10,000 sq. ft., .05 f/cc limit, 960 L. Microscope Field Area ≤.003 mm³ ③	1 composite sample/10,000 sq.ft., .05 f/cc limit, 960 L. Microscope Field Area ≤.003 mm³ ③
SEM	1 composite sample/10,000 sq.ft., .02 f/cc limit; 2,000 L. ①	--		1 composite sample/10,000 sq. ft., .02 f/cc limit; 2,000 L. ②
TEM	--	--	--	--
On-site Direct Reading △	Not Required	Desirable on bigger or complicated projects	Desirable on bigger or complicated projects	Not Required
Smoke Test ◘ for Neg. Press.	Not Applicable	Daily	Not Required	Not Required
Visual Inspection	Yes, for the record	Yes	Yes - this is crucial	Yes - This is crucial

PCM: Phase Contrast Microscopy NIOSH Method #239 or #7400, as specified.
SEM: Scanning Electron Microscopy
TEM: Transmission Electron Microscopy
△: On-site Light Scattering Direct Reading Particle & Fiber Counting Instrument (such as GCA Model RAM-1 Instrument)

① Results in 5 Working Days
② Results in 3 Working Days
③ Results in 24 Hours

Simulated Occupancy means: Fans operating/HVAC in operation or other appropriate measures.

◘ or manometer reading to .01 inch W.G.
** equivalent to .009 fibers/milliliter

* { 1 Sample At Decontamination Unit
2 Composite Samples in Assorted Rooms Adjacent to Work Area

④ Sampling & analysis to be done by an independent lab (not owned by removal firm) with NIOSH PAT Certification

SEE STATE PLAN ON FORM #778

Form #RA-780A

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Even now, with the latest N.J. Asbestos Task Force proposed airborne asbestos limit of 100 nanograms per cubic meter, the public is being misled. That sounds like a number very near zero--after all a nanogram is 10^{-9} or 1/billionth of a gram. But it is equal to 3,000 fibers per cubic meter--and those here today will breath between 3 and 9 cubic meters of air today--or even more. So that means the new proposed low level is equal to 9,000 to 27,000 asbestos fibers/day. The Asbestos Policy Committee should state that to the public--like I did in my May 7, 1984 testimony at the Washington, D.C. Asbestos Hearings. That testimony is on the following pages of this submittal today. If the public were told the newest tightest proposed limit means they can still breath 9,000 to 27,000 asbestos fibers/day, then they will be more rational about removing asbestos from many schools where there is no dangerous "cotton candy" highly friable asbestos--but where it is cementitious type, often "hard as a rock" and often out of reach of all but the 11 foot tall basketball players.

New Jersey is leading the nation in establishing an asbestos policy--but "Good God" let's correct the misleading nomenclature as we come to grips with the real differences in asbestos risks to workers and to school students. Let's not set a level lower than ambient. Let's not test it by the least used and unproven and most expensive test method. Let's have New Jersey's governmental agencies work with the recognized and involved commercial and consulting firms. Even Item 3 of Assembly Resolution No. 75 states all the State's agencies that should be involved--but nowhere states that the leading engineers, hygienists and removal contractors should also be contacted. We should be contacted before a major document like the Asbestos Policy Committee Report is issued....not after it is issued with so many errors and unworkable and unnecessary requirements.

TESTIMONY

OF

W. B. ROSSNAGEL, P.E.

PRESIDENT

ROSSNAGEL & ASSOCIATES

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at the

USEPA PUBLIC HEARINGS ON ASBESTOS

on

May 7, 1984

in the

NORTH AUDITORIUM OF THE HEALTH & SERVICES NORTH BUILDING

330 Independence Avenue, SW

Washington, DC

ROSSNAGEL & ASSOCIATES

Engineering & Testing Consultants
Air - Water - Noise
234 Rt. 70 • Medford, N.J. 08055
(609) 654-1441

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Good Morning:

BACKGROUND

My name is Bill Rossnagel. I am President of ROSSNAGEL & ASSOCIATES in Medford, New Jersey. We are one of the largest asbestos testing/consulting firms in the 9 state area from Massachusetts to Virginia. We did all the testing at the famous Howell Township, N.J. Ramtown School in 1977. That is the incident that triggered off the concern over asbestos in schools. We have tested asbestos in over 500 schools; in ships, tunnels, colleges, hospitals, state capitol buildings, etc. A further list of our experience is in the Appendix.

My own work with asbestos goes back 25 years when it was a problem in testing Polaris Gyros. Like thousands of other professional engineers (and architects), back in the 1960's I designed buildings which used asbestos containing materials. It was the right thing to do under the building codes of that time. In 1970 I founded my firm and we began doing bulk and airborne asbestos tests. In 1984 we were involved with the EPA in testing on the major Ambler, PA asbestos tailings waste pile project.

TESTIMONY

There are 5 basic points points in my testimony today. My first point is:

1) The USEPA, OSHA and the medical people have published the Airborne Asbestos Allowable Limits in a way which is misleading to the public. You probably are aware the limit, for 40 hours a week exposure (called the TLV■ or PEL▲), is now 2 fibers/cc or 2 fibers/milliliter (both designations mean the same) in the workplace.

SLIDE 1

SUMMARY OF ASBESTOS REQUIREMENTS - in fibers/ml or fibers/cc

Primary Requirements	Code from 6/72 to 7/76	Code from 7/76 to Now	Proposed Code
1. Allowable Maximum Limit	10 fibers*	10 fibers*	5 or .5 fibers*
2. Allowable TWA (Time Weighted Average) for 8 hours exposure per day	5 fibers*	2 fibers*	.5 or .1 fibers*
* fiber defined as larger than 5 microns in length and having an aspect (length-to-diameter) ratio of at least 3:1.			

That designation makes the public think the level is near zero. They should have better explained what is shown on the following pages.

■ TLV - Threshold Allowable Limit - maximum concentration of a contaminant that an adult male can be safely exposed to for 40 hours a week, 50 weeks a year.

▲ PEL - Permissible Exposure Limit - maximum concentration of a contaminant that an adult male can be safely exposed to for 40 hours a week, 50 weeks a year.

SLIDE 2

2 fibers/cc = 2,000,000 fibers/cubic meter

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SLIDE 3

and a person breathes 3-9 cubic meters/day (or more)

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Let's take the example of a relatively low outdoor/indoor airborne concentration of asbestos fibers. Let's assume a recognized very low concentration of .003 fibers/milliliter, which is the same as 3,000 fibers/cubic meter. If a person breathes at a:

Low Breathing Capacity & Rate

3 cubic meters/day x 3,000 = 9,000 asbestos fibers/day

High Breathing Capacity & Rate

9 cubic meters/day x 3,000 = 27,000 asbestos fibers/day

This is illustrated in Slide 4 which is also shown on the following page.

That is the way test data and the allowable limits should be presented. They should talk about numbers of 9,000 to 27,000 asbestos fibers a day that you and I, in this meeting today and travelling to and from it, will breathe. If the majority of the public knew that fact, they might take a second look before removing asbestos from some buildings with very, very little damage and a non-friable cementitious type asbestos ceiling that is above the reach of the students.

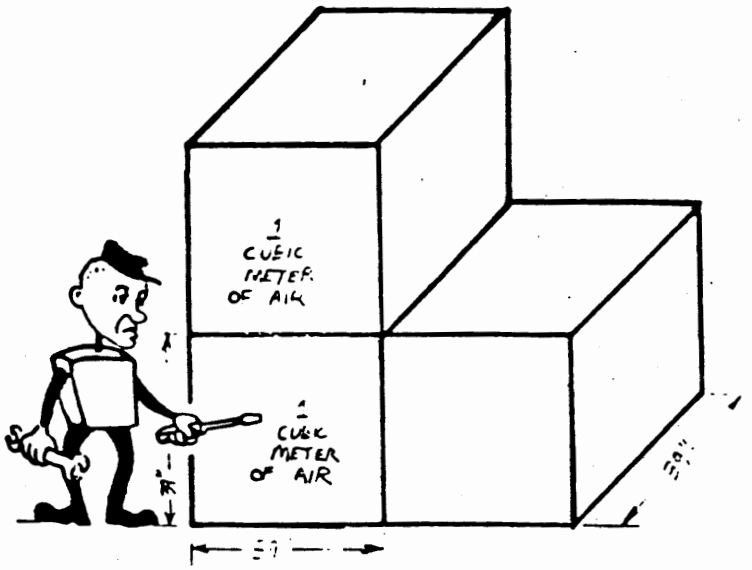
One more quick comment. ROSSNAGEL & ASSOCIATES has often been accused of being "against removal". That simply is not true. Our firm recommended over $6 million in asbestos removal work in schools in 1983 alone.

I also want to state that I have talked with persons suffering with mesothelioma, and who later died from it--only then can one really appreciate this American tragedy.

ROSSNAGEL & ASSOCIATES

Engineering & Testing Consultants
Air - Water - Energy

PERSPECTIVE ON THE AIR WE BREATHE

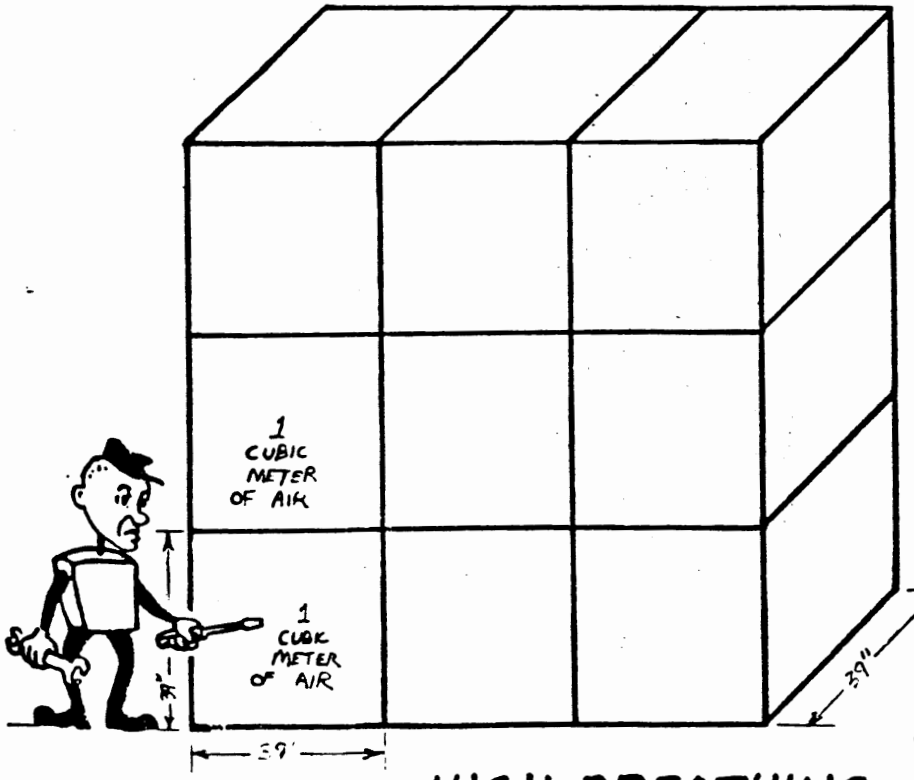


LOW BREATHING CAPACITY & RATE

2 liters/minute × 60 minutes × 24 hours = 3 cubic meters/day

If the airborne asbestos level is a very low .003 fibers/milliliter, then under this condition a person will breathe .003 × 1,000,000 × 3 = 9,000 asbestos fibers/day.

SLIDE 4



6 liters/minute × 60 minutes × 24 hours = 9 cubic meters/day

If the airborne asbestos level is a very low .003 fibers/milliliter, then under this condition a person will breathe .003 × 1,000,000 × 9 = 27,000 asbestos fibers/day

HIGH BREATHING CAPACITY & RATE

FIGURE I

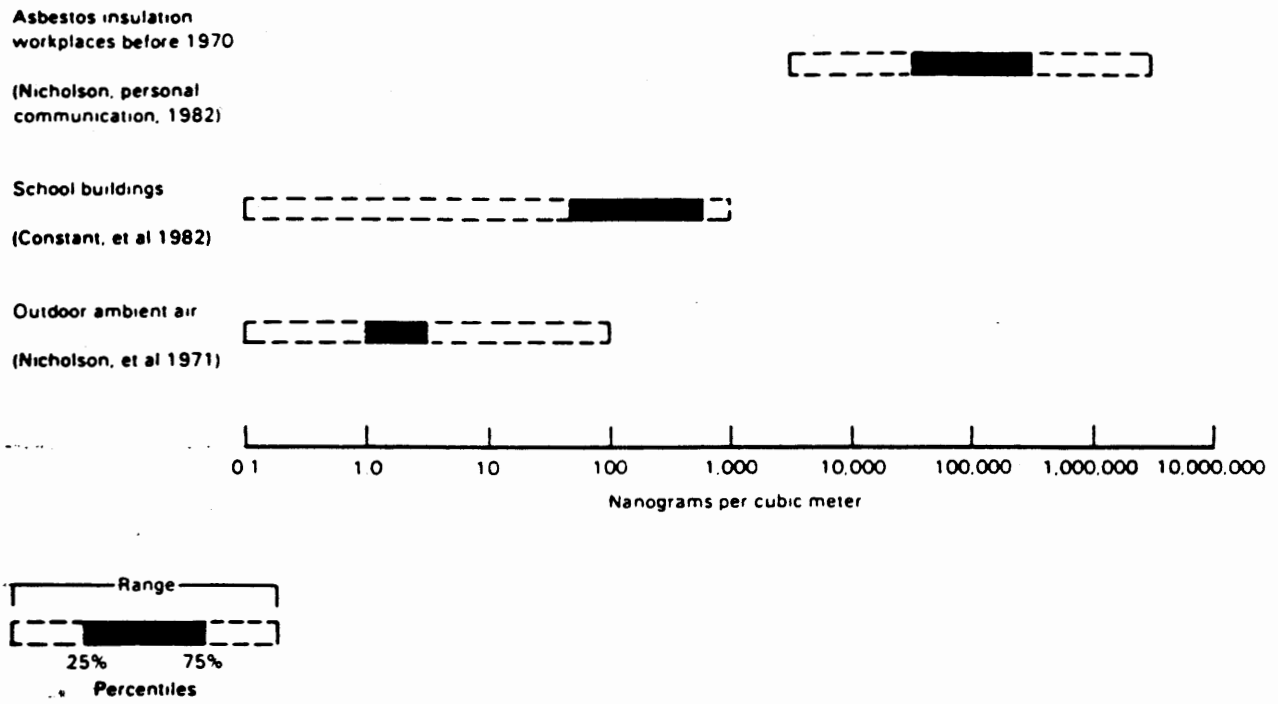
SLIDE 5

Here is my second point:

2) The EPA issued 2 asbestos guideline manuals in 1979, referred to in the industry as the Part I & II "orange" books, and another guideline "blue" book in 1981. The only presentation in all 3 of their books on the ambient asbestos levels was this EPA graph shown on Page 5.1 (Also Slide 6)

While the footnote on this EPA slide explains the data shown was by 2 significantly different test methods, the EPA ignored PCM (Phase Contrast Microscopy) data it had which would have helped provide a comparison based on similar test methods. The EPA disregarded the PCM data used by over 5 governmental agencies or profession societies (see Page 10) for over 25 years.

Figure 1. Comparison of measured airborne asbestos concentrations in three settings.*



*Levels in asbestos workplaces were derived from measurements using phase contrast microscopy (PCM) while levels in school buildings and outdoors were measured using electron microscopy (EM). PCM and EM measurements are not directly comparable. PCM measures all fibers whereas EM can distinguish between asbestos and nonasbestos fibers. In addition, EM has a better capability than PCM for detecting small fibers. In order to translate the workplace PCM measurements (expressed as fiber counts) into values of asbestos mass (nanograms) that are approximately comparable to EM measurements, 30 fibers were assumed to equal one nanogram. This value is an average obtained from many comparisons of PCM and EM measurements taken at the same location (industrial settings) and time. Values for individual samples range from about 10 fibers per nanogram of asbestos to well over 100 fibers per nanogram, depending on the average size of fibers and the relative number of asbestos and nonasbestos fibers in the air (Versar 1980 and William Nicholson, personal communication, 1982).

SLIDE 6

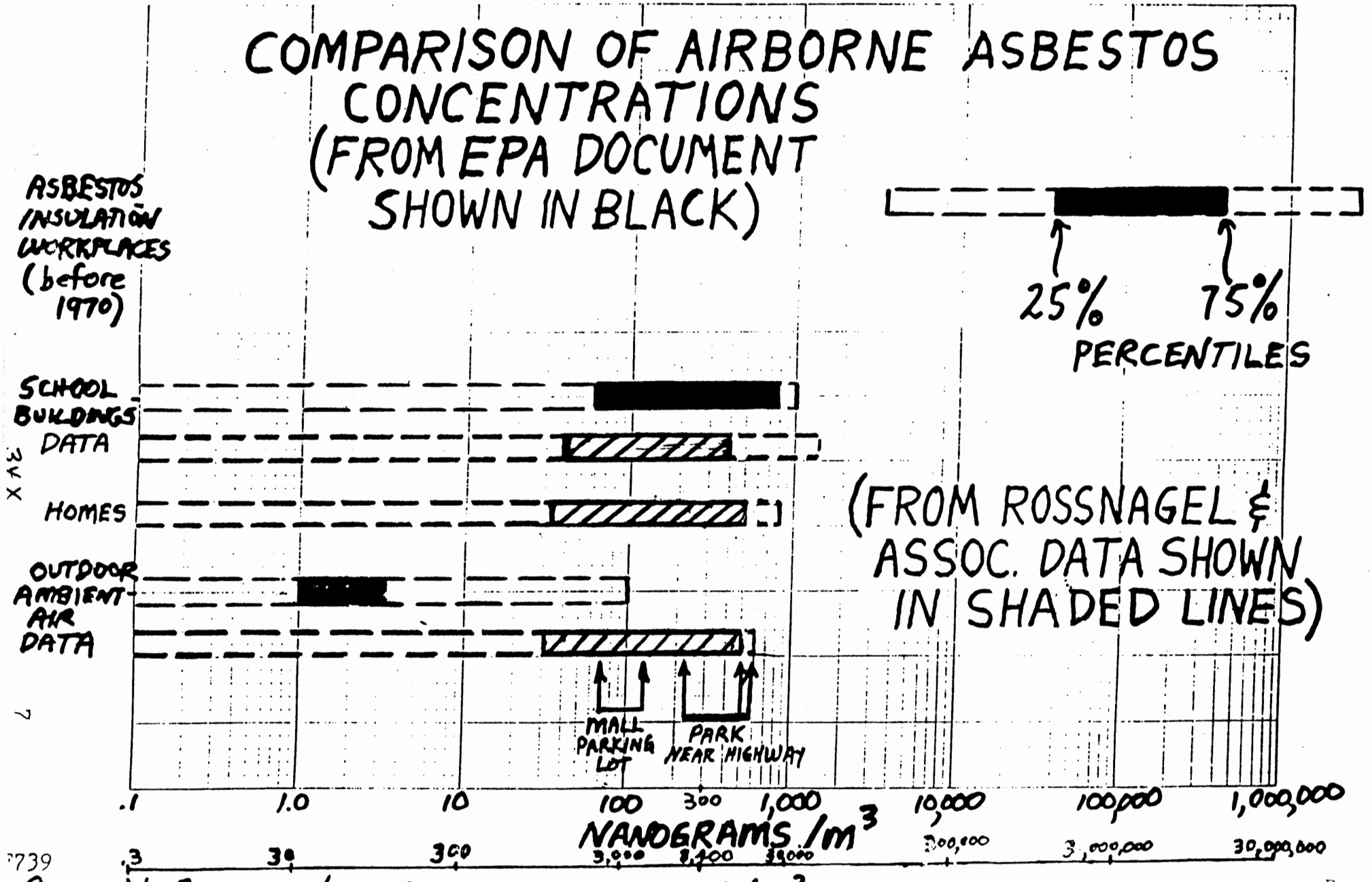
1-5

32x

And the EPA did not make it easy for the industry and public to understand this graph. You will note the "X axis" is in the units "nanograms/cubic meter". Less than .01% of all the airborne asbestos made to date have the units used by the EPA. The EPA should have added the widely used "fibers/cc" as shown in this graph we overlaid on the EPA graph (using the EPA conversion factor of 30:1): The EPA used nanograms/cubic meter which requires an expensive Transmission Electron Microscopy (T.E.M.) Analysis. The cost of T.E.M. is 7 times that of PCM.

SLIDE 7

SLIDE 7



Prepared by ROSSNAGEL & ASSOC.

Rev. B

You will note also that our data shows a much higher level of ambient asbestos, almost equal to the level in the schools. We have been unable to find out where the EPA ambient data was taken--but it must have been a very pristine location. All our over two hundred airborne asbestos tests in homes, stores, outdoors, parks, parking lots, playgounds, etc. show the ambient level in urban areas to be as shown on Page 7. This is over a hundred times higher than the EPA ambient level shown on Page 9.

The EPA has done little to explain to the American public that the average American will breathe perhaps 9,000 to 27,000 (or more) asbestos fibers TODAY. If you have a son who shoots baskets near a busy street--or a friend who jogs along a road, they may breathe up to 50,000 asbestos fibers in a day. This may be the first time many of you have heard this--because the agencies have rarely compared the test results to the amount of air (3-9 cubic meters) that a person can be expected to breathe every day.

Please do not conclude from Pages 5.1 and 7 that the asbestos levels in all schools is equal to the ambient level. The graph shows the 25% and 75% percentiles. Of course many hundreds of schools had to have asbestos removed because they are extreme cases beyond the percentile limits.

My third point is:

3) The EPA should have told all this to the American public--and particularly to the school board members anquishing over the costly decisions on whether to remove, enclose, encapsulate or do nothing about the asbestos in some school ceilings and pipes. They should also have been told that after the asbestos **has been** removed the airborne level of asbestos in the school will not be zero--but will be equal to the ambient level in that neighborhood as shown on Page 9.

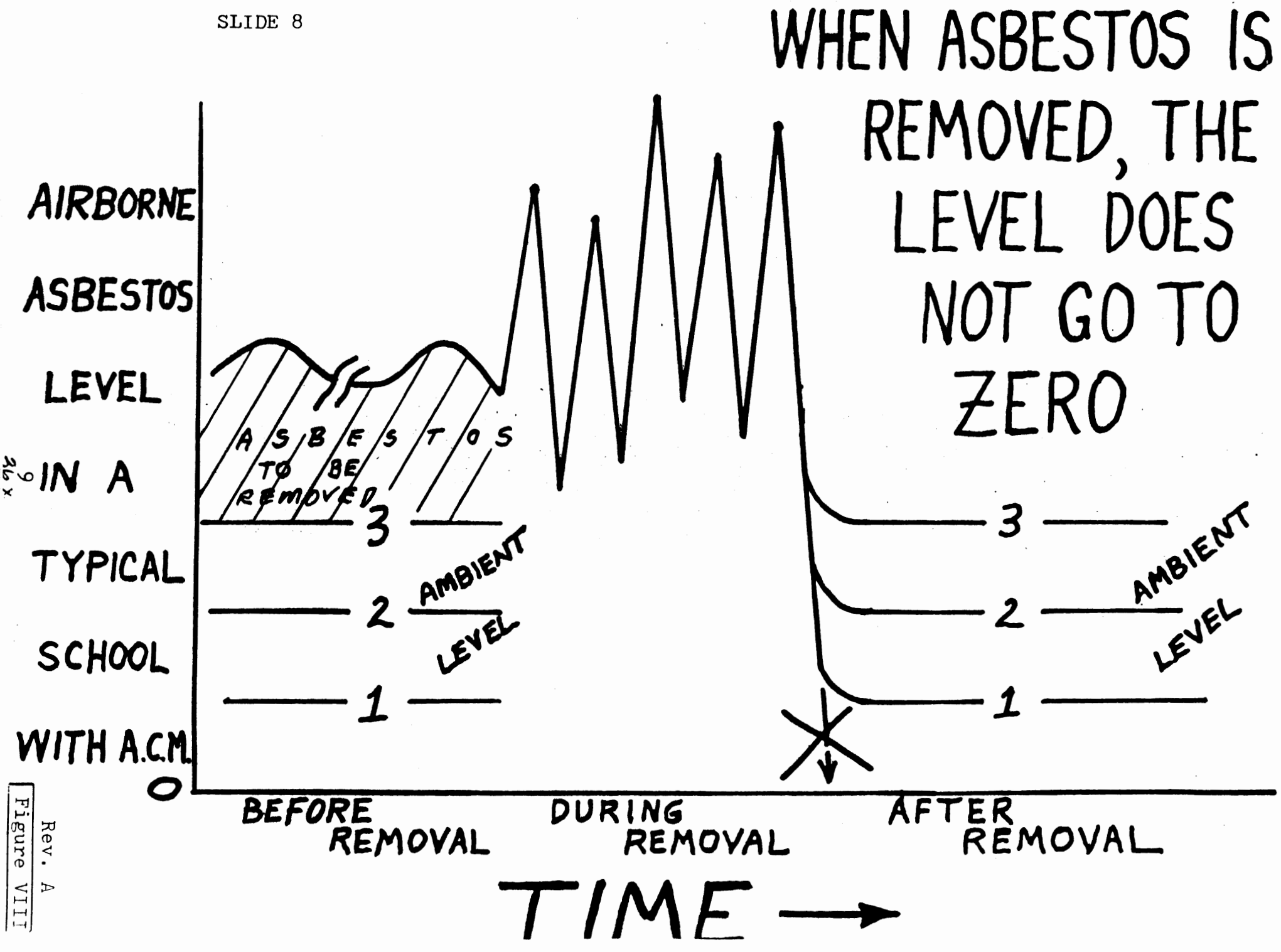
SLIDE 8

For example, in a city school surrounded by 2-4 story "brownstone" or similar houses, the street becomes a "canyon" holding high levels of airborne asbestos from the vehicular brakes. If it has not rained for several days, that level could be proportionally high as shown by Ambient Level 3 on Page 9.

Rev. B

35X

SLIDE 8



Rev. A
Figure VIII

My fourth point is:

4) If the EPA had better explained the airborne asbestos levels, then they could have **better** explained the conflicts arising when they state that even 1 asbestos fiber can cause mesothelioma....yet the EPA algorithm allows a risk level of 12 out of 162.

SLIDE 9

The EPA has also opposed airborne asbestos tests--even those tests (designated as NIOSH Test Method 239) which have been accepted in courts for years and has been used by the following 5 agencies each for over 25 years:

SLIDE 10

a) Occupational Safety & Health Administration
b) National Institute of Occupational Safety & Health
c) American Industrial Hygiene Association
d) American Conf. of Gov't. Industrial Hygienist
e) U.S. Bureau of Mines

Since asbestos is primarily only a problem when it is airborne, what is more accurate to test it than an airborne test very similar to the way in which a person breathes, as shown in these slides:

SLIDE 11

SLIDE 12

The EPA has consistantly opposed airborne asbestos tests.

The major concern is not whether a school ceiling has 5% or 50% asbestos as indicated in the bulk test. I would rather have my children in a school with 50% asbestos which is bound in tight (non-friable) than in a school with friable 5% asbestos ceilings. The question is how much of that asbestos is friable and becomes airborne because of:

- vandalism
- building vibration
- temperature changes
- air movement
- sloppy maintenance
- roof and pipe leaks
- drying out of A.C.M.
- other causes

To determine that one needs an air test, after the bulk test has confirmed the material to contain asbestos.

My fifth and final point is:

5) The EPA established the June 27, 1983 school inspection deadline--but they did not require a copy of the school's asbestos "Notification Sheets" to be forwarded to either the EPA or the applicable state agency. The present EPA audit of schools shows that many schools did not comply with those June 27, 1983 requirements. Other agencies also have outlined in detail the shortcomings of the EPA's Asbestos Control Program.

LIST OF ARTICLES ON ASBESTOS BY W. B. ROSSNAGEL, P.E.

		YEAR
M128 -	"ASBESTOS CEILINGS--ARE THEY SAFE OR NOT?"	1977
M138 -	"REQUIREMENTS FOR ASBESTOS TESTING & REMOVAL"	1977
M139 -	"OSHA FIBER & MINERAL DUST TESTS"	1978
M191 -	"MAKING DECISIONS TODAY ON ASBESTOS, FORMALDEHYDE & FIBERGLASS CONTAMINATION"	1982
M222 -	"SUPPLEMENTAL INDOOR & OUTDOOR AIRBORNE ASBESTOS CONTAMINATION LEVEL DATA"	1982
M224 -	"NOTIFICATION REQUIREMENTS RE FRIABLE ASBESTOS IN SCHOOL BUILDINGS"	1983
M251 -	"A MUCH NEEDED DISCUSSION OF ASBESTOS AIR MONITORING SPECIFICATIONS"	1983
M256 -	"THE CRISIS OF MISUNDERSTANDING ON AIRBORNE ASBESTOS LEVELS," PRESENTED TO SERVICE EMPLOYEES INT'L. UNION IN WASHINGTON D.C. ON MARCH 16, 1984	1984
M258 -	TESTIMONY OF W. B. ROSSNAGEL, P.E. AT EPA PUBLIC HEARINGS ON ASBESTOS IN WASHINGTON, D.C. ON May 7, 1984	1984
M264 -	"THE REAL STORY ON ASBESTOS," PRESENTED TO NEW JERSEY PUBLIC ADVOCATE'S OFFICE IN TRENTON, NJ on October 15, 1984	1984

W. B. ROSSNAGEL IS ALSO THE EDITOR OF THREE 35 MM SLIDE AUDIO/VISUAL TAPES (EACH 30 MINUTES DURATION) ON ASBESTOS AS LISTED BELOW:

ASBESTOS PART I -"ASBESTOS: A CHRONOLOGICAL HISTORY OF THIS HEALTH PROBLEM"

ASBESTOS PART II -"ASBESTOS: IMPORTANT DECISIONS TO BE MADE"

ASBESTOS PART III -"A CLARIFICATION OF TESTING METHODS"

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