P U B L I C H E A R I N G

before

SENATE ENERGY AND ENVIRONMENT COMMITTEE

on

Senate Bill 1492 and Assembly Bill 2020

(An Act prohibiting the extraction or processing of fissionable source material)

Held:
January 20, 1981
Morris County Courthouse
Morristown, New Jersey

MEMBERS OF COMMITTEE PRESENT:

Senator Frank J. Dodd, Chairman
Senator John P. Caufield, Vice-Chairman
Senator Barry T. Parker

ALSO PRESENT:

Senator James P. Vreeland, Jr.
Assemblyman James J. Barry, Jr.
Assemblywoman Leanna Brown

ALSO:

Michael F. Catania, Research Associate
Office of Legislative Services
Aide, Senate Energy and Environment Committee

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A P P E N D I X

SENATE COMMITTEE SUBSTITUTE FOR

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STATE OF NEW JERSEY

ADOPTED JANUARY 29, 1981

AN ACT prohibiting the extraction or processing of fissionable source material

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. The Legislature finds and declares that the exploration, mining or milling of fissionable source materials poses a significant danger to the public health, safety and welfare; that the hazards associated with these activities cannot now be prevented or satisfactorily minimized; that, therefore, unprecedented caution is needed in determining public policy pertaining to the exploration, mining and milling of fissionable source materials; that the prohibition of these activities is necessary at this time to insure the protection of the public health, safety and welfare; and that, during this prohibition, the Department of Environmental Protection should further study this issue and make recommendations for appropriate actions as hereinafter provided.

2. As used in this act:

a. "Fissionable source material" means

(1) Mineral ore which is extracted or processed with the intention of permitting the product to become or to be further processed into fuel for nuclear fission reactors or weapons; or

(2) Mineral ore which contains uranium or thorium in concentrations which might reasonably be expected to permit economically profitable conversion or processing into fuel for nuclear fission reactors or weapons;

b. "Reconnaissance" means

(1) A geologic and mineral resource appraisal of a region by searching and analyzing published literature, aerial photography and geologic maps; or

(2) Use of geophysical, geochemical, and remote sensing techniques that do not involve road building, land clearing, the use of explosives, or the introduction of chemicals to a land or water area; or

(3) Surface geologic, topographic or other mapping and property surveying; or

(4) Sample collections which do not involve excavation or drilling equipment, the use of explosives or the introduction of chemicals to the land or water area.

3. No person shall explore, beyond the reconnaissance phase, or extract, mill or process fissionable source materials in this State.

4. a. A person who violates this act shall be punished by a fine of not more than $10,000.00, to be collected in accordance with the provisions of "the penalty enforcement law" (N. J. S. 2A:58–1 et seq.). If the violation is of a continuing nature, each day during which it continues shall constitute an additional, separate and distinct offense.

b. In addition to the penalty provided above, if a person violates this act, the attorney general may seek injunctive relief to prohibit and prevent the violation.

5. a. The Department of Environmental Protection shall, within 6 years of the effective date of this act, prepare and transmit to the Governor and the Legislature a report concerning the dangers posed to the public health, safety and welfare by the exploration, mining or processing of any fissionable source material in this State. This report shall include recommendations for the prohibition or regulation of these activities upon the expiration of this act.

b. Prior to the preparation of this report, the Department of Environmental Protection shall conduct public hearings in any geographic area of this State which would be affected by the exploration, mining or processing of any fissionable material. Notice of these hearings shall be published at least 30 days in advance thereof in at least two newspapers circulating in the specific geographic area where the hearing will be held.

6. Nothing in this act shall be construed to:

a. Prohibit or impair any authority of the Department of Environmental Protection to provide for the containment, cleanup or removal of any fissionable source material which poses an immediate or imminent danger to the public health, safety and welfare.

b. Supersede or prohibit the adoption, by the governing body of any county or municipality, of any ordinance or resolution regulating or prohibiting the exploration, mining or processing of any fissionable material.

7. This act shall take effect immediately and shall expire 7 years from the date of enactment thereof.

SENATOR FRANK J. DODD (Chairman): I am Senator Dodd, Chairman of the Energy and Environment Committee. With me is Senator Parker of Burlington County, Michael Catania, the Committee Aide, Kathleen Crotty, the Assistant Director of the Senate.

Assemblywoman Leanna Brown is joining us and will monitor the hearings with us. The lead-off witness will be Senator John Dorsey whom I will call on in just one moment.

For those of you who have not registered, will you please do so at the podium on my right, and the people who will be testifying will be on my left. We will be dealing with two bills today, Senator Dorsey's bill and Assemblyman Jackman's bill, S-1492 and A-2020. The Dorsey measure is a complete ban on uranium exploring and mining. The Jackman bill sets rules and regulations governing the exploration and mining of uranium. Now, I know this is a controversial subject, and we will hear as many people as we physically can in the course of the day. We would ask that you not be redundant. If a point has been made, please go on to another point, but we just physically do not have the time. Just as a sidelight, there are several people here today that are extremely interested as we are in our water situation in this State. That will be our next immediate project with the Senate Energy and Environment Committee. We have introduced a packet of water bills. Unfortunately, none of the bills that have been introduced will do anything for our impending draught. We had a tour of the reservoirs yesterday, and they are nothing but mud holes, and I have the percentages. We are worse off now in January, 1981, than we were at the height of the draught in the sixties. So, you can imagine what we are looking forward to going into the summer, and we are going to need all the cooperation, effort, expertise, and some innovation if we expect to go through this summer without plant closings and job losses. We have a problem today. Let's get to it. Those of you who have written statements, it will be read into the record. We will have a published journal of this meeting.

With that, Senator Dorsey.

S E N A T O R J O H N T. D O R S E Y: Thank you very much, Senator Dodd, Senator Parker, members and staff of your Committee, and Assemblywoman Brown, let me begin by welcoming you to Morris County and to my legislative district. I want to express my appreciation for your Committee's prompt consideration of S-1492, and also specifically to thank you for coming here to Morris County where there appears to be the greatest interest in these two bills.

I wish to be very brief, because I have appeared in various forums, and see amongst those who are here to testify today some very prestigious and knowledgeable scientists in this particular field, particularly Dr. Montague of Princeton, Dr. Burnstein of Dover General Hospital and Dr. Johnsrud from Bucknell University in Pennsylvania. I think that they will offer to you the scientific justification for your selecting and recommending S-1492 over the bill submitted by Assembly Speaker Jackman. I think the point can be perhaps best and simply summarized and succinctly summarized in saying this: Based upon the scientific information that would be submitted to you here today, I think that you should be able to come to the conclusion that there simply has not been sufficient experience in terms of dealing with the issue of mining and milling of the uranium in this country in such a manner that it can be done in an environmentally sound manner. So that the population of this State, its water supply, its air quality can be sufficiently protected

at this point in time by the issuance of reguations and through the DEP which is suggested by Assemblyman Jackman's bill. Our prime contention with Assemblyman Jackman's bill and our difference is that we simply do not have the scientific body of knowledge today to adequately deal with mining and milling in an environmentally sound manner. And, that bill in contrast to S-1492 in essence and implicitly authorizes the exploration, mining and milling of uranium and gives to the Department of Environmental Protection to develop appropriate safeguards and standards.

We believe that at this point in time that bill is not adequate to deal with this particular subject. And, therefore, with that very brief introduction, Mr. Chairman, I would like to turn it over now to the numerous speakers who are here and who can throw a great deal more scientific light on the question than can I. Thank you again for coming to Morris County. (Applause)

SENATOR DODD: Thank you very much. Now I would like to call Senator Wayne Dumont, one of the, if not the, senior members of the New Jersey Legislature.

S E N A T O R W A Y N E D U M O N T, J R.: Mr. Chairman, Senator Parker, Assemblywoman Brown, thank you very much for this opportunity to testify. I will be brief. I also commend you for conducting this hearing in Morristown this morning. I want to support, particularly, Senator Dorsey's bill, Senate Bill Number 1492, as contrasted with Assemblyman Jackman's bill. I have great respect for Chris Jackman as a legislator, but my problem is that his bill would turn over to the Department of Environmental Protection, the making of within eighteen months of certain health and safety standards for the exploration of fissionable source material.

Having had a long and mostly unhappy experience with the Department of Environmental Protection - this is not partisan in any way, because my experiences have been throughout the creation of that Department some ten years ago when the name of it was changed from Conservation and Economic Development to the Department of Environmental Protection. I can say that I very truthfully would not want the standards and the regulations and rules to be promulgated by that Department. I think the answer lies in a complete ban on uranium mining, milling or exploration, which is what Senator Dorsey's bill accomplishes, and I am glad to be a co-sponsor of that, because he has bipartisan co-sponsorship on the legislation.

Some municipalities in his district, noteably, I would say, Jefferson Township, some in the district which I have the privilege of representing, mainly the fifteenth, which involves Ringwood Borough and West Milford Township along with all of Sussex and all of Warren, some municipalities in both districts have passed ordinances aganist uranium mining or exploration or milling in their municipalities. I don't blame them at all for having done so, and I am not one that has any particular fear of nuclear power. I say that because of the fact that as some of you know, I operate partly with a nuclear pacemaker which has kept me alive and well for almost six years. So, I understand the personal benefits of nuclear power, and I am not afraid of it in any way.

However, I think this is the kind of thing where there ought to be a complete ban until we know far more about it than we know today. Therefore,

Senator Dorsey's bill is - in my humble opinion, not because I am a co-sponsor of it, but because I believe in it - far superior to one that would place regulations and the standard making in respect to such mining and milling and exploration under the Department of Environmental Protection.

Senator Dorsey's bill also sets up heavy fines, where any person who violates the act would be fined up to $10,000. This is the kind of legislation we need at this time. There have been meetings on it. There was one just last Friday night which I unfortunately could not attend personally in Ringwood Borough which was sponsored by the League of Women Voters, and by an organization that is known as Prevention Against Uranium Mining Association, or something like that, and I am sure they discussed this in detail there, and they are represented here today.

That is really the sum and substance of my statement. There are many speakers I know that you want to listen to today. I thank you for this opportunity to be here, and wish you success in your work and also in ferreting out which you think is the stronger and better bill of those that are presented. Thank you very much. (Applause)

SENATOR DODD: Thank you. Senator Parker.

SENATOR PARKER: Wayne, I didn't ask John or the Chairman, but I want to set up the framework especially as far as preemption of the Federal law is concerned.

To your knowledge, or to any of our staff people, or to the prime sponsor, is there any problem involving preemption of Federal regulations by the Nuclear Regulatory Commission? In other words, do they or have they exercised jurisdiction as they have over the waste and the construction of the facilities. Have they exercised any jurisdiction over the mining of the source, the uranium or whatever---

SENATOR DUMONT: Not to my knowledge, Barry. But, on the other hand, I am not familiar with all the things they do. Mostly I was interested in what they were doing in connection with Three Mile Island when their investigation was going on there. I would think this is an area where the state certainly ought to be able to act and can act, and therefore, if we are in any way in contradiction with them, we better act and do what we think is right, and get some strong legislation in and then we can worry about any conflicts thereafter.

Frankly, I believe in state's rights and in states acting. I don't worry too much about the Federal interpretation or guidance, so called, that they might represent as far as we are concerned. I think we are entitled to act on our own and we ought to do so. And, I am sorry I didn't mention Senator Vreeland earlier. He is the co-sponsor of this bill also, and of course represents a large portion of Morris County, as well as some parts of Passaic and Union, as I recall it, as well.

SENATOR DORSEY: Maybe I can follow up with an answer. To our knowledge and those of us who have been involved, no one as yet has raised the concept of preemption by the Federal government or by the Nuclear Regulatory Agency. I suspect that if there was any existing regulations along those lines they would have come to light.

Let me also report to you and to the Committee that when I appeared in a forum in this matter in West Milford Township, Congressman Roe from Passaic County was also in attendance, and thereafter, he wrote to me and advised

at the time of the conference that he was in support of this type of legislation. I will read one paragraph from his letter. It says, "I have advised our mutual constitutents who wrote to me on this most important issue of your activities on introducing S-1492 and also that I would be plowing up further at the Federal level with similar legislation." So, from a Congressman in a district that is directly affected, he is in support of S-1492 and has offered his assistance at following up at the Federal level.

SENATOR PARKER: I would certainly endorse what you say anyway, Wayne. I think we ought to move first and let them worry second.

SENATOR DUMONT: Thanks a lot. I wish I could stay, but I have kind of a tough day.

SENATOR DODD: I know you will be with us when we start the water bill hearings.

SENATOR DUMONT: Yes, indeed. I will be with you on Thursday morning, because I have some grave doubts about some things in those bills.

SENATOR DODD: Thank you. I would like to introduce Senator Jim Vreeland, from the area, and he is co-sponsor of the bill.

SENATOR VREELAND: Thank you, Mr. Chairman.

SENATOR DODD: I would like to call on Dave Peifer, Upper Raritan Watershed Association.

D A V E P E I F E R: I am here today representing the Upper Raritan Watershed Association. We are a five hundred member conservation organization with offices in Bedminster Township. We are very much pleased to see that the Legislature is considering legislation of some type to regulate uranium exploration mining and milling. We favor legislation along the lines of S-1492, placing a total ban on these activities, rather than a regulatory approach as taken by A-2020.

We take this position for the following reasons: Potential permanent damage that could result from permitting these activities to take place is so great that public health, safety and welfare would be in constant jeopardy. The high level of potential risk to the State surface and groundwater supplies far exceeds the minimal public benefit that would accrue from permitting these activities. The socio-economic impacts upon host communities would strain already barely adequate municipal systems in many areas. These impacts have all too clearly been experienced in western mining areas.

In the event of a serious accident, present levels of technology, organization and finance are inadequate to permit clean up operations. There are several technological problems with the safe disposal of mine tailings, milling liquids and other waste products from these processes. In addition to the well-known problems of radioactive contamination from tailings, dust, radon 222 gas, and milling liquors, certain processes, noteably milling, consume large quantities of water. Deep rock mining always alters the groundwater levels by pumping. The allocation of New Jersey's scarce water reserve to these activities could endanger established industrial and domestic uses.

The establishment of a regulatory bureaucracy implicitly recognizes that such activities will take place. The establishment in administration of such a bureaucracy would prove costly and inefficient, wasting taxpayers money on a regulatory process that will provide us with little or not protection. There is no need to manage a problem that can be eliminated through legislation

at little public expense. We feel that the concept expressed in S-1492 is exactly what we would like to see happen. We would like to see any bill that is adopted include the following:

A statement recognizing the threats unique to New Jersey's residents arising from relationships between geographic location and water supply and population centers. And, this is a crucial point, I think, because the situation in New Jersey is far different from the situation in the southwest, and remote areas of the world where population centers are far from the sources of mining.

We would also like to see a recognition of the threats perceived by the citizens of Morris County and other areas by their acts of passing local ordinances, resolutions and petitioning the legislature for action. We would like to see a recognition of the rights of these citizens to receive maximum protection from the effects of these activities, and further that this maximum protection can only come from a complete ban on activities and that such a ban is clearly in the public interest.

As far as definitions are concerned in the various bills, we would like to see the definition of person as in A-2020 be adopted, which would include corporations, companies, associations, societies, firms, partnerships and joint stock companies, as well as individuals and government agencies; the definition of exploration and reconaissance in A-2020 is good. We would like to see a definition of fissionable source material that wasn't linked to concentrations of uranium authorium, but rather one that ties that definition to the economic process. What we are afraid of is that some time in the future, the mining of low grade ores and concentrating them with new technologies not presently available may make the mining of them practicable. We would like to see stiffer penalties for violations, and specific prohibition on the future establishment of the permitting system in the State. Thank you very much. (Applause)

SENATOR DODD: The most obvious question that must be asked, if indeed the bill is released and passed, and signed into law is that which will be from out of state, and they will be saying, "New Jersey, you want uranium fuels" - although I know a great many of us don't - "but you are not willing to open your own grounds to explore for it, as was the case during the exploratory period when the Federal government was issuing leases for offshore exploration of oil and gas.

Now, we do have some unique features, and I would tend to agree with you that we are the most densely populated state in the nation with the huge aquifer that underlines most of the surface of New Jersey, and the contamination from the tailings as was experienced in Colorado and New Mexico. I understand that there were several towns built on those tailings, with the attendant health hazards that have since developed. So, we should learn and can learn from those experiences in the past. But, we must be cautious as to how we are perceived throughout the rest of the nation. Our first obligation, of course, is to ourselves, we as New Jerseyans. Again, thank you for your testimony.

MR. PEIFER: Thank you.

SENATOR PARKER: May I ask you a question? When you are talking about the definition of fissionable source material, paragraph 2A indicates a weight of .01, which is--- Is there any reason as to why that is in there?

Why .01? Why not say, "totally prohibited?"

MR. PEIFER: I don't know the reason why that particular figure was included, but having experienced problems with water contamination, that is a whole can of worms, based on concentration, which no one can agree on are harmful. I would rather fissionable material--

SENATOR PARKER: Be totally prohibited?

MR. PEIFER: Be defined in such a way as in A-2020, which says, "economically recoverable" or words to that effect.

SENATOR DORSEY: I can answer your question factually. 1492 contains that because it was taken from the Vermont statute. Vermont, apparently, is the only other state in the nation which has been faced with a similar problem of which it was legislatively concerned and they supplied us with their solution and this is the definition which we, as non-scientific persons, picked up.

SENATOR DODD: Have they faced any legal challenge on that, John?

SENATOR DORSEY: Not to my knowledge. I think that they have been successful in adopting legislation similar to 1492.

SENATOR DODD: Okay, thank you very much. I would like to acknowledge Senator John Caulfield, Vice-Chairman of the Committee who has joined us, the City of Newark, Fire Director, who has had his hands full lately. The Chair will call Pat O'Connor from the Public Interest Research Group.

P A T O ' C O N N O R: Good morning. I would like to thank the members of the Senate Energy and Environment Committee for the opportunity to testify here today. My name is Pat O'Connor and I work for the New Jersey Public Interest Research Group, and today I represent its 25,000 members.

The New Jersey Public Interest Research Group supports Senate bill 1492. PIRG believes that the uranium mining industry must be prevented from entering the state. The record that the uranium mining industry has built for itself has been horrendous. Many incidents have been documented, such as violations of health, safety and welfare of workers and the communities in which they operate. One example of the uranium mining industry in New Mexico has been the case of the United Nuclear Corporation. On July 16, 1979, their tailings storage pond in Church Rock collapsed, sending approximately 100 million gallons of radioactive water and 1100 tons of tailings solids into the river. The dam, at the time of the accident was only two years old. To allow an industry with this kind of track record into this state would be an act of insanity, with complete disregard for the safety and welfare of the citizens of New Jersey.

The area where mining has been proposed is one of the most scenic areas in the State. It is also a major recreation area. If mining were permitted, this area of recreation would be destroyed.

The area of proposed mining has had problems with its drinking water. Residents of Jefferson Township, for the past two years, have been able to drink their tap water only after boiling it for ten minutes. Water has also become a major crisis in New Jersey. The uranium mining exploration territory is within a few miles of the headwaters of all the states northern rivers: The Delaware, the Musconetcong, the Walkill, the Raritan and the Passaic.

The mining of uranium in New Jersey will release large amounts of deadly radon gas. The mining of uranium will also generate large amounts of waste. For every 100 pounds of rock taken from the earth, only one pound, at the most, can

be used. The remaining 99 pounds are waste. The waste is known as "tailings". These tailings, while useless to the industry, retain 85% of their reaioactivity. The wastes are then stored in large piles above ground, subject to the elements. The largest pile in New Mexico is 60 feet high and approximately a mile long. A pile of this size in New Jersey would be an ecological disaster.

Citizens of thirteen towns in New Jersey have decided that they would not permit uranium mining within their borders. The towns of Jefferson, West Milford, and Ringwood, where uranium has been discovered, have banned mining. Other towns have passed resolutions supporting the ban. They are Sparta, East Hanover, Hillside, Bloomingdale, Clifton, Bayonne, Vernon, Hardwick, Piscataway, and North Bergen. Although these towns are geographically dispersed, they have all realized the importance of preventing uranium mining in New Jersey. Petitions have been circulated throughout the state and approximately 13,000 signatures have been collected.

The movement to ban uranium mining in New Jersey is a serious, well-organized, diversified, citizen action coalition. People from many different parts of New Jersey, from different political beliefs and organizational goals have unified for this one important cause. For the sake of the future of New Jersey, and for our children and for the children of tomorrow, I plead with this Committee to exercise the only humane option open to them, to ban uranium mining in the State of New Jersey forever. Thank you. (Applause)

SENATOR DODD: Thank you very much, Pat. I would like to call on Dr. Peter Montague. (Applause)

D O C T O R P E T E R M O N T A G U E: Thank you very much. I am Peter Montague and I am here as an individual, not representing any organization. I had a slide show about uranium mining in the western states. I was on the faculty of the University of New Mexico at Albuquerque for ten years from 1970 to 1979 in the School of Planning. In New Mexico, where half of the uranium that is mined in the United States is mined, planning for the problems associated with uranium mining is a major factor in a planner's education. I didn't bring the slides, anticipating that there wouldn't be time to show you a twenty to twenty-five minute slide show of that, but sometime in the future, if you would like to see this, it is an impressive physical record of what the history of this industry is. When you see them, you can try to transpose the pictures of enormous tailings piles to someplace in Morris County or, perhaps, even Middlesex County because that's where the milling might go on. You would get a better feel for what is really involved in this industry.

The fact is that regulation of this industry has not worked in any state in the United States where the industry is currently operating. New Mexico, Wyoming, Colorado, Utah have all tried to regulate this industry and they have failed. The results of this industry operating in those states are very widespred and very serious water pollution, continuous air pollution which, as far as I know, cannot be mitigated by any known technology, very serious community problems--in New Mexico it is called the "boom town syndrome", where a small group of outside workers or in some cases a large group of outside workers come into a rural area and disrupt the area in terms of need for public services and by failure of the community to be able to provide those services in the timely fashion, these communities are typically characterized by high rates of alcholism, high rates of drug use, high rates of divorce, suicide. So, there are social problems associated with this industry in addition to the physical and environmental health problems.

The Environmental Protection Agency, itself, in Washington, has tried for several years to write regulations that they believe would adequately control this industry and they also have failed and they are in their fourth or fifth year of trying to write regulations that they believe would adequately control the milling of uranium and they have not yet issued regulations. As I'm sure you are aware, they have resources at their command that the State of New Jersey simply does not have.

The Department of Environmental Protection which, under A-2020, would have responsibility for trying to regulate this industry, as it stands today, does not have the required expertise. In order to write a set of regulations or even in order to decide what is needed to be regulated, one would need, as a minimum, expertise in geochemistry, geology, hydrology, water resources, health physics, which is the physics and health aspects of radioactivity, epidemiology, medicine, mental health, economics--and this would be economics of the industry and economics of public programs--community planning, mining technology specific to this industry, milling technology specific to this industry and mine reclamation technology specific to this industry and that, of course, would involve agronomy, soil science and other aspects of ecology. The Department of Environmental Protection not only doesn't have this expertise, but I really wonder whether, under the State Civil Service setup, as it currently exists, I wonder whether the DEP could hire the necessary expertise. I am certain that they could not do so in 18 months. I am not indicating that I believe that the industry can be regulated. I do not believe that the industry can be regulated because I believe that the history of this industry is that attempts have been made and they have failed. I'm saying just to try to get a handle on thinking about the problem of what should be regulated, in other words, trying to decide whether or not this state really could regulate it, one would need the kind of expertise that I have outlined and I don't think the DEP has it and I question seriously whether they could get it.

New Jersey is not an agreement state. We have not agreed to take over the Nuclear Regulatory Commission's responsibilities for regulating this industry. The NRC currently regulates the milling industry. The EPA is supposed to set environmental standards, which they have not done. So, even in the absence of those standards, the Nuclear Regulatory Commission has legal responsibility for controlling milling activities. We do not have the option to regulate those activities, as I understand it. I am not a lawyer. It is my understanding--and I urge you to check into this--that we do not have the option, at this time, of becoming an agreement state and taking over, at the state level, those NRC activities. So, those activities would continue, as I understand it, to be regulated by Washington D.C.

The record of this industry is exceedingly poor, as far as I'm concerned. The regulatory mechanism has essentially broken down. The very large mill tailings piles that result from milling activities, the high exposures to workers who operate in the mills, the high exposures to people who live near the mills, are all, to me, evidence that the federal regulatory bureaucracy does not do an adequate job now.

I favor the moratorium or a ban on the further development of this industry in this state. I believe that S-1492 is preferable as a way of dealing with these problems as compared to A-2020. I would suggest that S-1492, perhaps, could be modestly amended to contain some "whereas" clauses to give reasons why the New Jersey legislators feel that a ban is desireable. It is my understanding that the legislation--and again, I'm not a lawyer--but I believe that the legislation might be more favorably received if it gave some health and safety reasons, which, to me,

are the principle reasons for wanting to control this industry or to not permit this industry to develop in this state. I would suggest something along the lines of, "Whereas New Jersey is very densely populated and already has evidence of the occurence of pollution related health problems, and whereas the experience in other states indicates that health problems are associated with this industry, and whereas solutions to the pollution from this industry may not exist at all, therefore, we take the following actions."

Let me dwell on that point very briefly and then I will stop talking. There does not seem to be, today, any technological solution for the leftover crushed rock that results from milling uranium. There is an excellent publication put out by the U.S. Geological Survey which is Circular 894. This relates, specifically, to the problem of what to do with so-called mill tailings, the leftover crushed rock which results from milling uranium ore. That publication suggests that those materials should be placed back in the ground in "deep, dry mine shafts," that is to say, mine shafts should be hollowed out of the ground for the specific purpose of sequestering these materials. This is probably too expensive for the industry to live with and probably not possible in the areas of the country east of the 100th meridian, east of the semi-arid sections of the country. In other words, in the humid sections of the country, I doubt that it is technologically feasible to find a deep, dry mine shaft. Mine shafts tend to become wet very fast in the eastern part of the United States. So, I don't know of a true solution to the problem of uranium mill tailings. I would not object to someone studying this problem from the point of view of seeing whether the technology does exist while the ban is in place. In other words, the ban could have a finite limit on it. You could say that this is a ten year ban during which the problem will be studied further and if the studies conclude that the technologies do not exist, then the ban would, at that time, become essentially permanent.

But, I think there are serious problems with trying to regulate this industry. As A-2020 is written, the DEP would be required to issue permits at the end of an 18 month study and that, to me, is buying into a great deal of trouble in the future. Thank you very much. I would be pleased to answer any questions that I can. (Applause)

SENATOR DODD: We don't have applause meters. I'm sure the speakers do appreciate the encouragement, but we can get more done if we don't have it. Doctor, there could be a legal problem with us not being an agreement state. The Committee will look into that. I had experience with the federal nuclear energy agency in Denver, Colorado last year. We were brought out as representatives from New Jersey along with other sister states, especially in Region 2, which we're members of, to deal with the disposal of uranium fuels from our nuclear power plants and we still do not have a federal method of disposal and what you are addressing today is very true as to branching off into another area where we have already experienced in other parts of our country horrendous ruination of parts of our environment. I think your key point is the water source in the Northeast, particular to New Jersey, our acquifers. I think that is probably the most telling thing and I think the sunset provision where the moratorium would have an end at some period where we would relook at this down the line is good. Senator Dorsey?

SENATOR DORSEY: I would just like to say that I have seen Dr. Montague's slide show and it is very impressive in the sense that I think all of you would be taken back if you could see the devastating effects which those slides show in terms

of the environment in New Mexico. It would look like something out of the 1700's that an industry might leave a swath of destruction as they have there. Dr. Montague, I would be happy to amend the statement on the bill to include some reasons. I thought they were rather obvious, but I'm wondering, just for the record, could you give us just a little of your professional background so it will be in the record along with your statement?

DR. MONTAGUE: Yes, sir. I am employed at Princeton University as the Administrator of the Inter-Disciplinary Study of the Generation and Disposal of Hazardous Substances in the State of New Jersey. We have 18 people on the project in civil engineering and chemical engineering and the Center for Environmental Studies. I do not have a PhD in any field relevant to uranium mining or milling. My professional training is as a planner, which I taught for ten years and I have written two books with my wife Katherine on the subject of toxic, heavy metals and for the last five years I have been exclusively studying radioactive heavy metals and their disposal. I am on a panel of the U.S. Congress's Office of Technology Assessment studying the disposal of radioactive wastes.

SENATOR DORSEY: Thank you very much.

SENATOR PARKER: Senator Dodd has alluded to it and we served with your colleague some years ago who was the head of the commission for which we adopted legislation, finally, having to do with the high level toxic wastes and our moratorium on that. As you know, New Jersey, as a result of those committees and those studies, have adopted a moratorium on all nuclear facilities unless there is a way to dispose of that toxic level waste. Let me just ask you a question and this goes, perhaps, to the technical expertise. I don't know what your background is. Maybe it isn't geology, but as I understand it, these uranium and thorium and some of the others are now in existence in their natural state and are subject to the same normal elements and the like. Can you tell us whether you know for a fact, without any mining, are any of these things getting into our system here in New Jersey?

DR. MONTAGUE: I asked the state geologist this question, Dr. Woodman--maybe he isn't the state geologist. He is aware of 125 places in the New Jersey highlands where there are outcroppings or surface expressions of radioactive materials. If a person had a shallow well for drinking water purposes sunk into one of those outcrops, they very well could have excessive quantities of radioactivity in their water supply. It is true that these materials are naturally occurring, but the vast majority of them occur below the surface where they are separated from human beings and other living things. It is when they are brought up to the surface by mining activities or,in the case of these 125 naturally occuring places, by erosion that they could cause problems and I've said this numerous times in public. If I worked in the New Jersey highlands and I was raising a family and I had a well, I would have my well tested to see if I was encountering radioactivity.

SENATOR PARKER: Let me ask you one other thing too and this goes to the limitation, although it did come from the Vermont statute. Why would there be any reason for us to limit it to .01 instead of just an absolute ban? Is there any reason that you can think of or any economic or environmental or geological reason why we would limit or put a limitation of any kind on the mining of it?

DR. MONTAGUE: Well, uranium occurs in most minerals. For example, granite will have very low concentrations of uranium in it. So, if you didn't put some kind of a limit on it, you might prevent people from mining anything, including granite and sand. I don't know why the .01% was selected. I personally favor

the kind of stipulation that the first speaker recommended--Mr. Peifer, I believe it was--that rather than putting a numerical limit on it, why not say economically recoverable uranium ore or word it somehow so that the "economically recoverable" relates to the uranium because sand is economically recoverable under some circumstances, under many circumstances, in fact. So, if you could word the limit so that it is not permissible to explore for or remove from the ground economically recoverable quantities of uranium ore, I believe that would be best. In New Mexico, they are currently mining 0.17% ore. So, the .01% is seventeen times more restrictive than that, but as Mr. Peifer pointed out, the technology can very well change and it might become economically feasible to mine .01% ore at sometime in the future.

SENATOR PARKER: The problem is--maybe I understand Vermont because that's the Granite State and they do ship a lot of that for economic benefits to their state as a major industry. I don't believe that's so in New Jersey. My problem, even with the economic aspect of it, is why should we give any leeway to the industry if it's going to do what we say it's going to do, affect the water, affect the beauty of an area? As you said, that is one of the prettiest areas of the state. Why should we even build in any economic criteria and/or any percentage criteria? Why not have just an outright total ban?

DR. MONTAGUE: As I said, there might be sand or gravel that might contain a very low acute parts per million or parts per billion of uranium and if all uranium is banned from mining, then you might not be able to have a sand or gravel pit. You might not be able to construct roads, for example. I really hadn't thought about this before this morning, about what the cutoff should be, but my rapid response was that I like the idea of saying that which is economically desireable is that which we don't want pulled out of the ground because if it is not economically desireable, then no one would want to pull it out of the ground anyway.

SENATOR PARKER: Well, that may or may not be so. I don't know. Maybe some of the other doctors or speakers that are coming after can address that specific point as to the amount that would be recoverable, the amount that is in sand, whether we should have some limitation or whether it should be a total ban. Maybe they can explain the geology of it.

DR. MONTAGUE: There should be some criteria for deciding. I wouldn't try to ban it all, for the reasons that I gave. I think uranium is very widespread throughout the surface of the planet and you might ban many, many economic activities that you didn't intend to ban.

SENATOR PARKER: Let me just ask one thing further on the tailings. You say the tailings--and maybe I missed you--came from the milling operation. That is removed or could well be removed from the mining operation.

DR. MONTAGUE: The problem is that, as the gentleman from PIRG pointed out, the economically recoverable portion of what is pulled out of the ground is a very small fraction, less than one pound for every hundred pounds. So, a person who mines this material can't afford to transport it very far before they crush it and take out that one pound because they're paying for the transport of that 99 useless pounds. So, the milling, because of the economics of the industry, typically the milling occurs as close to the mine as possible, right at the mine, if possible, and certainly not more than fifty miles away. So, milling is an integral part of the mining. They are not separate.

SENATOR PARKER: And there is so much residual that is still radioactive that we get the difficulties from it?

DR. MONTAGUE: Right. When you are pulling out the uranium, you have 85% of the original radioactivity left in the tailings. The decay chain is such that there are 14 other radioactive elements produced by the decay of uranium 238 and only the uranium is the desireable element. The other 14 radioactive elements are thrown away in the tailings. That's the problem.

SENATOR DODD: Doctor, using that again--I'm back to the definition--would that preclude us trying to take care of an outcropping, which you mentioned were numerous, if there were an accident, an earthquake, a slide or some type of thing, where we had to go in and actually move the outcropping? By definition, that possibly would preclude us from contracting someone to go in and adjust that.

SENATOR DORSEY: I think that's the answer, the bill. What is prohibited is the extraction, milling or processing. If you're just going to go and take away an outcropping to alleviate a situation, that would not fall into this category.

SENATOR DODD: That would be extracting. So, again, the other definition, we may have to take a look at that later down the line. Anything further? Thank you, Doctor.

DR. MONTAGUE: Thank you. (Applause)

SENATOR DODD: I would like to welcome Assemblyman Jim Barry who has joined us from Morris County. I would like to call on Linda Sacks, Association of New Jersey Environmental Commissions.

L I N D A S A C K S: Good morning. My name is Linda Sacks and I'm on the staff of the Association of New Jersey Environmental Commissions. The Association is a non-profit organization that represents individuals, civic groups and municipal and environmental commissions all over the State of New Jersey. Environmental commissions are a formal part of local government. Their role is to advise on environmental issues.

In this capacity, many of them in North Jersey have expressed great concern about the possibility of uranium exploration, mining and milling in our state. They have read considerable amounts of literature on this subject. They have attended public forums, spoken to industry representatives and they have concluded that uranium exploration, mining and milling pose unacceptable risks to the public through the radioactive contamination of air and water. They have also concluded that these problems cannot realistically be controlled by government regulation and that uranium mining and milling are not compatible with other land uses in New Jersey.

Last summer, the Jefferson Township Environmental Commission co-sponsored a public forum to inform residents of Jefferson and other surrounding communities about the hazards of uranium mining. That forum was instrumental in mobilizing overwhelming public opposition to uranium mining. That public opposition has convinced five municipalities to pass ordinances outlawing uranium mining and milling and a half a dozen other towns have passed strong resolutions calling for a statewide ban on uranium operations.

Since that time, people all over the state have been requesting information about uranium. People have been attending public forums sponsored by environmental, civic, public interest and safe energy organizations. Two new groups have formed to stop uranium mining in the state and a coalition of groups is also now working towards that goal.

What we've been hearing is that people and their local governments absolutely do not want the risks associated with this industry. They refuse to be

guinea pigs for an industry that has never operated in an area as densely populated as this and seems to have always operated with a well documented, flagrant disregard for the public health and safety. People refuse to spend their tax dollars to finance a new bureaucracy to run around after powerful uranium companies to try and make them obey regulations that haven't been successful in preventing contamination anywhere else.

No one has the right to decide that people must accept the unique risks associated with the uranium industry other than the people themselves. The Department of Environmental Protection does not have the right; the industry does not have the right; and the government does not have the right if the people have said no. So far, it seems that all the people who have an opportunity to express an opinion have said, "No, we don't want it."

On behalf of all those people and on behalf of future generations, to whom we should leave a legacy of pure water, clean air and a liveable planet, not a legacy of radioactive tailings that will remain hazardous for hundreds of thousands of years, the Association of New Jersey Environmental Commissions asks this committee to support a total ban of uranium exploration, mining and milling in New Jersey.

I would just like to make one sort of off-the-cuff remark. Senator Dodd you expressed concern about the way the rest of the country might perceive New Jersey if we said that we didn't want to take the risk, but yes, we did want the fuel. I would just like to say that so far, the people haven't been adequately informed by the government about the hazards associated with this industry. In many cases, I think the government has, I think, intentionally withheld information. When the industry began thirty years ago, we did not know then what we know now. So, this debate that we're having today, this controversy, maybe it should have happened thirty years ago. But, I still think that we've got to look at it now. We've got to debate it now and we've got to do what is right now.

SENATOR DODD: But, my job is to play the devil's advocate on many issues that I may or may not disagree with. We do not always go the easy route or what may be expediently popular at the time and we have to look at all aspects of every issue, and we do. An emotional issue like this, along with the economics and energy and all the other components, these are not minor decisions that we are being asked to make today. I bring these points up only from a devil's advocate position.

MS. SACKS: Oh, I'm glad you have. I think it's very important.

SENATOR DODD: Thank you very much. I would like to call Gary Gittleson, Prevent Uranium Mining Alliance of West Milford.

G A R Y G I T T L E S O N: Good morning. I am Gary Gittleson from Prevent Uranium Mining Alliance of West Milford. I live in Upper Greenwood Lake, approximately two miles from the Exxon drilling site and I suppose you could say that I have a vested interest in this because I think that two miles is not a safe distance. On the other hand, I own about 24 acres of land there and I also own the mineral rights. I found that out recently after careful checking. Maybe that is a contrary vested interest. I'm not sure. That places me in an unusual position, I think, perhaps similar to your position in making a decision on this issue, in that I'm not an expert in the areas that one needs to be an expert in in order to make a decision. I'm not a medical person; I'm not a geologist or a nuclear physicist nor any of the other things that Dr. Montague listed that one would have to be in order to make an intelligent decision on one's own. So, the question is, how does one do it?

I think, perhaps, you might benefit from my experience in this, because I've been at it for several months now. I made the decision early in the summer based on, essentially, taking testimony in a somewhat more informal way than you're doing now, but I listened to people speak. I read as many articles as I could find on the subject and I must say that I heard precious little from the other side. I've heard very little in favor of uranium mining in New Jersey or anywhere, but especially in New Jersey.

My wife recently received a letter from the Manager of the Department of Energy Office in Grand Junction, Colorado, which I intended to read to you, but I understand that Dr. Wagoner will be reading that to you. So, I would just like to refer to it, but listen for it when he speaks. It seems, to me, to be a typical point of view from that other side. It is full of bland, patronizing tones and completely devoid of facts.

I also spent a very brief moment with the President of Sohio when he was down at Jefferson Township and also when he spoke before the people of Jefferson Township and he referred to what he called the risks of uranium mining. He said that there are risks, but there are naturally risks in every endeavor and it seemed to me to be a subtle use of the word risk. I think, rather than risk, I would call it a danger. I think it has been well documented and demonstrated and I think you will hear people speak to that point today that if we have uranium mining in New Jersey, we will have a certainty of illness and death as a result. The only risk factor, I suppose, that we could put in is that we don't really know who is going to die. We don't really know who would get lung cancer or whatever other types of cancer or disease there are. In fact, there are probably innumerable kinds of diseases not even yet discovered related to uranium mining because uranium mining also releases a great number of pollutants besides the radioactive ones.

Now, I feel a little bit ashamed to have to raise a straw man here in the form of the President of Sohio, who is probably not here, and the same with the gentleman from the DOE. I have the feeling that there is probably no one here who would be in favor of uranium mining today and that's been my experience in dealing with this issue all along. We've been fighting an invisible enemy.

That too has helped me in making my decision or at least, in this case, reaffirming it, because I made my decision somewhat before that. In terms of these vested interests, it seems to me that the only people who will speak in favor of uranium mining that you will find--because they are the only ones that I found--are the people who have a direct, monetary, vested interest in uranium mining. I must say that the gentleman employed by the DOE is one of those, even though he is a government employee. That agency is on record of being in favor of all forms of nuclear energy and when you hear his letter, I think you will agree with me.

On the other side of the issue, that is to say, my side, we have vested interests too. We have medical doctors who have devoted their lives to protecting life and health. Sure, their interests, if that is their interest, and I'm sure it is, are definately served by preventing uranium mining in this area. That is the first vested interest that I have. I want to protect my home and my family. The question is, how do we reconcile these two things? How do we preserve the public safety on the one hand and the right of Exxon to earn money, Exxon, Sohio, Chevron and the others, and perhaps, indeed, the right of South Korea to obtain uranium, because that is probably where it would go, or at least, one of the places. It is ironic that we are asked to make an additional human sacrifice to that country. Now, I know

that it is often said that politicians--and you folks are politicians--

SENATOR DODD: Aren't we all?

MR. GITTLESON: Probably, yes. It is often said that politicians seek compromises to most issues and I think that is generally to be applauded. Generally, people hold compromise to be a good thing, but how do you find a compromise between these two positions without compromising the health and safety of the people of New Jersey? This is the point. The word compromise could be used in two senses. One is generally considered to be good and the other is not so good. No one wants to be compromised and in this case, no one wants his health or life to be compromised.

Now, I would like to talk, just for a second, about the two bills that are under consideration. I have been speaking to a few legal experts and I've gotten some confusing opinions. I'm not a lawyer and I don't claim to understand all of the intricacies. I think I understand them enough to know that perhaps nobody does. But, one of the opinions that I've gotten is rather disturbing and it relates to Assembly bill 2020. The suggestion is that because of the way New Jersey law is constructed, if that bill were to pass, it would effectively remove from the local municipalities the right to do any further regulation or banning of that industry. I see some concerns with that opinion.

SENATOR DODD: State law always supercedes local, as does federal supercedes state.

SENATOR PARKER: That's not always so.

MR. GITTLESON: But, there's a case where I wouldn't want to take the risk.

SENATOR PARKER: Generally, the municipalities only have delegated authority, that which the Legislature gives them. So, it's a little more complex than just stating that. If, for instance, they go to court and they hold that this power wasn't inherent in some of the zoning powers, they could be stricken. So, I don't know what this bill does. I don't know whether it specifically removes it or not. I don't see that language.

MR. GITTLESON: The opinion that I got was that it would remove it, according to this opinion. It would remove it unless it specifically granted the right to that regulation or banning.

SENATOR PARKER: I think that is probably a fair statement.

MR. GITTLESON: If that's the case, and I think it is at least possibly the case, I would like to suggest that as a last resort, if it looks like it is totally, politically impossible to achieve an outright ban, perhaps a regulation along the lines of the Vermont law, which I think is technically a regulation, not a ban, which specifically allows the local municipalities to impose further regulations or, in fact, bans would be good. I think that is specifically spelled out in the Vermont law. I would propose that that kind of thing be considered as an alternative, if a political alternative is needed. An alternative to what? An alternative to Senator Dorsey's bill.

I will say one further thing. I was slightly disturbed at the suggestion that we might put a time limit on Senator Dorsey's bill because I think, if there are technological developments in the next ten years that make mining safe and feasible in New Jersey, we have legal mechanisms for rescinding laws. We don't really need a built-in contraction. We can let it happen the way it would normally happen. The reason I fear that is that I think that it would tend to put the burden of proof on us, ten years from now, to show that the developments have not actually taken place

and that it is not yet safe. I think I would prefer an outright ban. I have to agree that, perhaps, some explanations for the reasons of it should be added to the bill and that seems to be no real problem. But, in general, I prefer Senator Dorsey's bill to anything that I have heard so far. As a second alternative, I think the Vermont law should be considered. Thank you. (Applause)

SENATOR PARKER: I would just like to make a comment. Those of you who have a copy of the bill, Section 3b does do exactly what you said. It would preclude a municipality from enforcing its own regulations in case Assembly bill 2020 were passed. So, it would effectively block any home rule effort or local effort to prohibit the use of it.

SENATOR DODD: Thank you very much. I would like to call Dr. Joseph Wagoner, Research Epidemiologist.

D O C T O R J O S E P H W A G O N E R: Mr. Chairman, other distinguished Senators and Assemblymen and Assemblywomen, I am here at the specific request of Dr. Walter Burnstein as a follow-up of my earlier briefing of the Morris County Medical Association on their deliberations on uranium mining.

I am a graduate of the Harvard University School of Public Health, having received my doctoral degree with a major in Epidemiology and Bio-statistics and a minor in radiation biology.

My role in the investigation and control of the adverse health and environmental consequences of the mining and milling and waste disposal of uranium bearing ores date from 1960, when I entered the United States Public Health Service. During the past 21 years, as a staff member of the National Cancer Institute and National Institute for Occupational Safety and Health and as a consultant to the U.S. Environmental Protection Agency's Waste Task Force, the University of New Mexico and the Navajo Community College, I have been engaged in studies involving the hazards associated with the uranium production industry. During the past several years, at the request of the Senate Human Resource and Judiciary Committee, Senator Kennedy presiding, the Senate Special Committee on Aging, the British Royal Inquiry on Uranium and the United Nations Council for Namibia, I have given formal testimony concerning these activities.

I come to you today with a deep sense of compassion, responsibility and trust. Compassion, because of the fact that nearly forty years ago, in the pursuit of nuclear weapons development, our society chose to disregard the knowledge that radioactivity within the European mines was associated with a large excess of lung cancer. As a result of that decision, miners of uranium bearing ores throughout the world, and most certainly in the United States, are and will be continuing to be dying at an epidemic rate of lung cancer and other respiratory diseases. Responsibility because of the firm conviction that today, in the pursuit of nuclear weapon development, our society has a moral obligation to insure that never again will it disregard existing information and thus repeat the tragedies of the past. Trust, because of the sincere belief that given the full benefit of the contemporary scientific data on uranium, you, the members of the New Jersey State Legislature, will take a posture consistent with a concern for the health of its citizens and the preservation of its environment.

Indeed, the exploration of uranium in the United States has left us with a lesson in history that we should not forget. Our experience with uranium can best be termed as one of the most shameful chapters in the annals of science, medicine, government and industry. With your kind indulgence, I should like to briefly

recount for you what we have learned over the course of the past twenty years and what that may mean to the current attempts for exploitation of natural resources in New Jersey and, more importantly, the human resources of your state.

As early as 1546, we knew that miners were dying of an unusually high frequency of fatal lung disease in Europe. To give you some idea of the magnitude of this, in 1913, Arnstein reported that of 665 Schneeberg miners dying, 40% of these or 276 of them died due to lung cancer. A couple years later, on the other side of the mountain, in Czechoslovakia, 40% of those miners were also shown to be dying of lung cancer. It was against this state of scientific knowledge that large-scale mining and milling started in the United States in the 1940's and I think it only natural that the scientific community should have expressed a public concern for this hazardous industry and, indeed, they did. As a result of that expressed concern, the United States Public Health Service initiated a major program in 1950 to delineate and hopefully mitigate those hazards.

As it pertains to New Jersey, let me give you some information that we now know for sure. Over the years, most of the uranium production in the United States has come from underground mining. As part of underground mining, ground water is carried by pipes, pumps from the ore body to the surface for release or use as mill process water. Dewatering rates,are currently known to range as high as 4000 gallons per minute in New Mexico. As a result of that, during the period 1956-1978, in four areas in New Mexico, a total of 127,371.4 million gallons of water have been withdrawn from the water table in New Mexico alone.

We also know that there have been significant concentrations of radon. I might indicate that in 1971, the U.S. government passed and promulgated a regulation concerning the control of the environment within those mines. Yet, in 1975 through 1977, the Mine Safety and Health Administration undertook a blitz program. Their federal inspectors entered into some 22 mines employing approximately 1600 workers. This audit demonstrated that 23% of the mines in the United States, in the western part, were currently exceeding one working level, a value that would automatically require a closure of that mine. Yet, none of those mines are closed. Maximum concentrations as high as 24 working levels were detected.

What do we know about the biological consequences of exposure. The Public Health Service has demonstrated that exposure in the uranium mines is associated with a variety of non-malignant disorders. By 1974, we've demonstrated that deaths due to non-malignant respiratory disease among U.S. uranium miners had reached epidemic proportions. From among 3300 of these miners that we've been studying, 80 of these individuals had died due to non-malignant respiratory disease, where only 25 should have died.

As early as 1962, we were able to demonstrate a three-fold excess of lung cancer among underground miners. I would like to hand out for your benefit a series of studies that have been undertaken with the date of publication by the Public Health Service. What you see is that out of this group of 3300 miners, through 1978, we now have 205 of these people who have died due to lung cancer. There should have only been 40. That means that 165 of these individuals needlessly have died due to lung cancer because we did not pay attention to the information. The problem is not just unique to the underground miners. We've also showed problems among the Indians. In fact, a recent study out of the Shiprock Indian Health Service Hospital has shown out of 17 lung cancers that have occured in that hospital, 16 of them occured

among uranium miners. 14 of these were confirmed never to have smoked a cigarette. What that says is, if you are an American native and you don't smoke, you don't get lung cancer. If you don't smoke and you work in an uranium mine, you have an epidemic.

Now, since 1971, there have been a variety of additional studies in Canada, Czechoslovakia and Sweden, all of which report the inadequacy of our current standards for protection of the workers. In April of 1980, there was a petition filed against the United States Government requesting an emergency, temporary standard and, indeed, the government did respond to that because on June 30, 1980 the National Institute for Occupational Safety and Health acknowledged the inadequacy of the current standards and declared that the exposures were of such magnitude as to cause concern for major public health. The Director transmitted that information to the Assistant Secretary of Labor with a recommendation that the current standard be lowered. I am submitting a copy of that report for your benefit. It gives the whole chronology of the information.

Perhaps the largest potential health and environmental problem associated with uranium involves the waste discharge and disposal. During the underground mining of uranium bearing ores, a considerable amount of air is vented into the surrounding atmosphere. In 1975, the EPA undertook a study of outdoor radon at selected locations in the Grants area of New Mexico. The two highest radon values measured was 6.6 pCi per liter and 5.4 pCi per liter. Each of these were taken at different locations, one a U.S. post office and the other a trailer court, where there were sizeable opportunities for people to be exposed and at locations which had a mine ventilation exhaust duct nearby. EPA also determined that background levels were approximately .72 pCi per liter.

SENATOR PARKER: Excuse me, Doctor. What is that?

DR. WAGONER: Pico-Curies.

SENATOR PARKER: Would you spell it?

DR. WAGONER: P-i-c-o-c-u-r-i-e-s.

SENATOR PARKER: What is a pico? Can you tell us? I know what a curie is.

DR. WAGONER: Pico-curie is three orders of magnitude down. Now, there's been a lot of discussion about the amount of radiation that is left in the ore after the milling. There's been a lot of discussion about how it is put in tailings on piles. In reality, we know that that type of containment has not done the job and, for your benefit, I would like to release to you a report which just came from the New Mexico Water Pollution Control Bureau, talking about water quality data from discharge from the mines and mills, which documents mine for mine, mill for mill, the dessemination of hazardous materials in addition to radioactive materials, selinium, molybdenum, arsenic and the full array of toxic chemicals.

Now, two areas are of major concern and have only recently come to our attention. The first is the area of the impact on ground water quality. In 1977, the EPA reported the results of a detailed study in the Grants mineral belt in New Mexico. By way of this study, they've shown that the water systems of many of those communities have been severely impacted to the point of containing selinium at 340 times the current levels enforced by EPA. Selinium is a carcinogen. As a result the water of those communities have been declared hazarous and unfit for human consumption. Probably, the greatest concern now is in findings which have just come to our attention within the last year and a half and these address the issue of genetic hazards to

the next generation. An estimated fifty to seventy-five uranium mines have been, in the past, operating in the Shiprock, New Mexico area during the period 1954 to 1968. A mill opened in that area in 1954. This mill, located along the San Juan River, continued in operation until 1968. During its operating life, the mill processed 1,500,000 metric tons of uranium bearing ores. Today, tailings, abandoned in two adjacent piles, cover approximately 72 acres and are located in near proximity to a number of schools and a number of businesses. Now, we have done--and I say we because I'm working with the Navajo nation--we have done a survey and to date we have detected already sixty homes in the Red Valley area with gamma radiation exceeding background levels. These homes were built with materials from the mines, not mill waste, but mine debris. The current Mill Tailings Act, passed by the United States Congress, specifically exempts any regulation for mine waste. So, all of these homes have no federal remedial action after disposal.

In 1980, a provocative, abnormally low male-female sex ratio was observed among Navajo births at the Shiprock Indian Health Service Hospital. The secondary sex ratio for all births at the hospital was determined for the period 1964 through 1979. During that period of time, there were 5459 live male births and 5427 live female births. That gives you a male to female sex ratio of 1.005. This value differed significantly from that expected on the basis of normal statistics. Normally, 106 males should be born for every 100 females. So, in order to determine the normal sex ration for the Navajo Indians, we went into three other Indian health service hospitals where there was no uranium. In those hospitals, over a seven to eight year period, the sex ratios were 106, 105 and 105. Thus, that one area where we have abandoned uranium and where mining has taken place shows that less males are being born than should be. Now, the significance of this overt sex ratio among American Indians is further substantiated by studies of Mueller et al, who, in an earlier study in Caechoslovakia demonstrated an overall decrease in the proportion of male births among offsprings born subsequent to the mining of uranium. In that same study, when consideration is given to parity--that is, birth order--a significant decrease in male births was demonstrated.

On the basis of these and other findings, the March of Dimes' Birth Defects Foundation has now awarded a contract to the Navajo Community College to study the relationship between exposure to radiation from uranium mines and mills and the risks of birth defects. In addition, we are now conducting semen studies among the uranium miners. This is important because we now know that radon preferentially accumulates in the gonads.

In conclusion, I should like to state that history has provided us with a bitter lesson--that lesson being that all phases of the uranium industry from the exploration to the mining through the milling to waste discharge and disposal have been and continue to be adversely affecting the health and the environment. I think the question is clearly before all of us and most appropriately before you people in New Jersey. That question is: Will society have learned from history or will we repeat the mistakes of the past? As an aid to you in addressing that question, I should like to quote Mr. Willard Wirtz, former U.S. Secretary of Labor who stated in 1967, when addressing the uranium mining problem, "There is no more critical imperative today than this society's assertion of the absolute priority of individual over institutional interests and of human over economic values." I thank you and I would be more than willing to answer any questions that you have. (Applause)

SENATOR DODD: Doctor, we would like to thank you for an extremely detailed and very enlightening discourse on the subject. The water intensity, the use in uranium mining, what was that figure again?

DR. WAGONER: The dewatering rates in New Mexico range from 20 gallons per minute at very shallow mines, up to 4000 gallons per minute being extracted from the water table so that the mines can be sufficiently dry that they can process and remove the ore.

SENATOR DODD: And, this would certainly be the case in the northern part of New Jersey.

DR. WAGONER: I would suspect so, yes.

SENATOR DODD: As we understand the acquifer layout of northern New Jersey, which is basically the entire portion, this would be at a very high rate.

DR. WAGONER: Yes, very definately.

SENATOR DODD: What degree of contamination would that water have?

DR. WAGONER: The water, before it is put into a holding area--

SENATOR DODD: In proximity to the tailings.

DR. WAGONER: It has about two or three processes of decontamination. The use of that water is either to be used in the mill process and then put into holding ponds or for putting it in settling ponds, but we know it doesn't stay there. None of the ponds and the piles in New Mexico are lined with clay lining or with polyethylene type lining. As a result, into the water system, into the ground water and seepage downstream, we have detected molybdenum, we have detected higher concentrations of gross alpha and selinium and other toxic chemicals.

SENATOR PARKER: Let me just make an observation first. Your biggest fire trucks pump about 1000 gallons per minute. So, people can see what volume you are talking about when you are talking about 4000 gallons per minute. I just wanted to ask you a question about any neutralization of any of the toxic substances. I wonder if there is any way to neutralize, for instance, in this holding pond, any of the toxic substances. Molybdenum is a metal, right?

DR. WAGONER: Yes.

SENATOR PARKER: Can't that be extracted in some way?

DR. WAGONER: I suppose maybe the selinium and some of the other natural elements could be extracted. It would be a very costly process.

SENATOR PARKER: Are they carcinogenic?

DR. WAGONER: Selinium has been shown by the National Cancer Institute, within the last six months, to be carcinogenic. With regard to the full extraction of the radioactive nucleii in the tailings and in the ponds and piles, one has to recognize that we're talking about a half life of thousands of years for these. So, they are there for our children and our children's children and they will not disappear. Currently, there is no stabilized mine tailings, mill tailings in the United States, not one fully stabilized mill tailing. I know of no mine that has been fully stabilized in the United States, except one experimental mine under the control of the United States Government. That means that we have abandoned mine shafts for children to enter into. We've shown that this is the case on the reservation because we've seen coke cans and other soft drink cans in and at the mine shafts within the last year. I don't know of any existing technology to control those hazards. What that means with regard to your problem up here--we're talking about the western part of the United States with a very sparsely populated area and now we're talking about New Jersey and my home state, Virginia, where we're putting a very hazardous industry into the

confines of a very densely populated area which is already being adversely impacted because of the need for the ground water and, sir, in my estimation, this is pure madness. It is madness because what I cannot understand is why are we holding our mines down in New Mexico because we don't have a market for it and then turning around and saying, "We want to mine uranium in New Jersey where you can't control it." Those are some of the questions that I think really have to be answered.

SENATOR PARKER: So, as I take it, from what you are saying, there is no way to either naturally or artificially neutralize any of these by-products that would be coming out of either the tailings or the other toxic substances?

DR. WAGONER: Not that I know of. One of the ways that they have attempted to cleanse the water system is by an injection well system. What we have seen now is that they have taken water from above the mill, entered it into the injection well system and, indeed, the concentrations of selinium, rather than decreasing, have gone up because they are just forcing the contamination downstream towards a populace area.

SENATOR PARKER: In other words, it is just concentrating it, making it worse, than if they just let the tailings or the pumping out, otherwise, than just putting it into some holding pattern?

DR. WAGONER: Right.

SENATOR DODD: Well, I have viewed the mountains of tailings in the western regions bordering and in some places where the river actually cut through the mountains of the tailings. So, that it had to carry it through. In our case, it is underground water which we will soon be having for our own resources and our own dire needs in New Jersey.

DR. WAGONER: And, believe me, sir, they are not only mining uranium. They are mining water, water that is needed for agricultural purposes.

SENATOR DODD: Senator Caufield?

SENATOR PARKER: Let me just follow up on that. If it is then spray irrigated or put on the areas where we are growing crops, does it then get into that food cycle and the food chain, like lead and mercury does?

DR. WAGONER: There are studies that I believe have been conducted by groups out in New Mexico which have shown that the contamination in the soil area has preferentially been taken up in various types of grass and foliage that the life stock eats which means it obviously has to get into the human food chain, yes.

SENATOR PARKER: And, do your studies indicate that ingesting it in that way would be just as hazardous as breathing it or coming in close contact with either the water or the air?

DR. WAGONER: Well, I don't think we've got the answer, but I don't think we can afford to wait to find out the answer. It would seem to me that we're getting more of the long lived radio-nucleii. It is not the short radon daughters or progeny that we see in the mines, but the thorium and some of these elements. These distribute themselves differently in the body. Thorium concentrates in the lymph nodes whereas lead 210 concentrates in the bones and that is why we have an excess of bone cancer among the radium dial painters and it has been suggested that by ingestion of waters containing radium that there is an excess of this bone cancer.

SENATOR PARKER: I just wondered because I know strontium 90 and some of the others get into the atmosphere and then fall on the vegetation and then gets into our milk and the whole chain and I just wondered if these did also.

SENATOR DODD: Senator Caufield?

SENATOR CAUFIELD: No questions.

SENATOR DODD: Doctor, thank you very much for a precise and well done presentation. (Applause) The next witness is Doctor Walter Burnstein.

D O C T O R W A L T E R B U R N S T E I N: Ladies and gentlemen, Senators, Assembly-people, directors, aides, I have come here today to discuss the impact of uranium exploration, mining and milling on the health of all the citizens of New Jersey.

The American Cancer Society, in a recent publication, states that a majority of all cancer cases in the U.S. today are believed to be environmentally related, that is, associated in some way with our physical surroundings and our personal habits and life styles. They state, "We are in an era when people are exposed to multiple carcinogens, both chemical and physical, such as ionizing radiation." The medical literature has recorded an increased incidence of cancers, leukemias, and genetic defects in individuals exposed to radiation. Epidemiological studies have provided data correlating disease induction and radiation exposure at moderate and high doses of radiation. Now, there is much evidence of an inverse relation between radiation exposure and disease; a lower dose of radiation exposure such as occurs with uranium mining may produce even greater disease incidence than higher radiation doses. The high dose results in the reproductive cell death; lower doses of radiation result in cellular and chromosomal damage, while still allowing the damaged cells to reproduce. We have documentation of the health damage done by lower dose ionizing radiation due to the tragic history of medical x-ray in its early days carried out by physicians who meant well and who were living up to the standards of their time. There is a 40% higher cancer and leukemia mortality in children whose mothers were irradiated during the pre-natal period. Children who had radiation to enlarged thymus glands, which was a common practice when I started practicing twenty years ago, have a high rate of thyroid cancer, cancer of the Salivary gland and cancer of the para-thyroid gland. Children who had radiation of the scalp due to benign conditions such as skin rashes and ringworm have a much higher rate of tumors of the brain, the thyroid and the parotid gland. Cancer of the breast in women who in the early days had tuberculosis and were followed by multiple fluoroscopies, cancer of the breast in these women have been shown to be extremely high and much higher than the normal population. In fact, today, without technology, at one time, mammography of the breast was recommended every six months. Now, it is done only when there is an indication for it.

We must remember, though, that medical x-rays are dangerous, but presently, a patient with informed consent receives a definite dose, delivered over a definite time to a specific ara of the body and it is given to a known person or patient. Radiation from uranium sources is total body radiation, which occurs minute after minute, hour after hour, day after day, year after year for thousands of years. Radiation from uranium mining spares no one. The uranium mine does not question if the woman getting the radiation is pregnant, nor if there are children getting this total body radiation, nor if there are individuals who have serious medical illnesses and cannot tolerate any additional radiation.

When uranium is mined, two highly carcinogenic substances are released as decay products that we are discussing: radium and radon. Radium is soluble in water and causes extensive radiation injury if ingested or inhaled. Radium concentrates in the bone and in the skeletal structures. Radium's effects were known a long time

ago. In the early twentieth century, in the Oranges, right here in New Jersey, radium watch dial painters licked radium coated paint brushes to help shape their brushes, which were used to illuminate the numbers on the watch and clock dials. Though the radium paint contained a relatively low concentration of radium, the material concentrated well in the teeth of the individuals. The radium watch dial painters, as we all know, developed osteogenic or bone cancers, cancers of the paranasal sinuses and mastoids, leukemias and their children had high rates of birth defects. This is a tragedy that is well documented and well known to most people.

Radon is another substance released during uranium mining. Inhalation of radon daughter products is related to high rates of cancer of the lung in miners, as already stated by Dr. Wagoner. We must remember that when the mines are vented so that the workers will have a safe environment in which to work, when the working level gas is brought down to a safe level or what is thought to be a safe level for the miners, these radon gases and daughters do not disappear. They are vented into the air of the communities and if we have uranium mining in New Jersey, they will be vented into our communities. There is no escape from these gases. As has been proven in New Mexico, these radon daughter particles can settle and get into the food chain. Dr. Gottlieb's group in Shiprock, New Mexico, who did the original work on the cancer of the lung situation, and other researchers are now working on the frighteningly increased incidence of birth defects in the Shiprock area of New Mexico. There are at least 2½ times to 5 times higher birth defect rates in this area of New Mexico than is found elsewhere. The newborn children are manifesting enlarged heads and in a telephone conversation yesterday with Dr. Richard Siegel, who is doing a study in Shiprock, he said that at this point, they still do not know what the significance of these large heads are, but they are not normal and he anticipates problems such as retardation and downs syndrome being associated with this phenomenon. These children have convulsive disorders, retardation, downs syndrome, congenital heart disease, cleft palates, leukemia of the newborn in large amounts, much larger than the normal population, white cell counts of over 100,000 at birth, and death of the male fetus, as already stated by Dr, Wagoner, which, of course, is a defect and is a signal for other birth defects to follow.

At this time, I would like to discuss with you a very significant study done by the British Columbia Medical Society at the request of the government of British Columbia. The people of British Columbia have had a problem similar to ours, where companies wanted to come in and explore, mine and mill uranium and the British Columbia Medical Society did an intensive eight month review of all the medical literature pertaining to this issue. The physicians who did this study have become so committed to this issue and the dangers involved that they have established a permanent library of all the literature available and will mail copies of it to anybody who requests it. They state in their study that there is no safe level of radiation exposure below which there is no danger. There will be a biological effect at all levels. They also state that the risks of radiation at low levels are considerably greater than what was previously thought to be the case. They point out that it is a very complicated issue which we know little about, although what we do know is terrible. There are sub-groups in the population who are at greater risk, such as children who have allergies, simple allergies such as asthma or skin rashes. These children, this sub-group of children who have simple allergies, due to an evident immunological defect in their systems, have an 8 times greater chance of developing leukemia than the normal

population. Children who have had bacterial diseases, such as pneumonia, pertussis, or dysentery have relative risks of leukemia 4 times greater than the controls. One of the researchers stated that the data supported the findings that the effect of ionizing radiation is comparable to the effect of aging. When my wife and I were with the Hopi nation doing some work there, the medicine men and women of the Hopi tribe, the doctors, told us that they attempted to keep their people away from uranium mines, both as miners and living near it, because they knew it was dangerous because people aged rapidly. They didn't need any of the extensive, technological studies that we need in our society. They just observed that people who were 40 looked like they were 70. People who were 50 ended up looking like they were 80. There seemed to be an abnormal, rapid increase of aging at the very cellular level and these people, at the age of 40 and 50, were developing not only cancers, but every degenerative disease known to man which had never been present in the Hopi nation prior to uranium mining such as heart disease, diabetes, arthritis and so on. There are some medical studies which face this issue, but the research is evidently being done in something much more dramatic and that's cancer.

In a paper presented by the Radiation Protection Section of the Environmental Improvement Agency of New Mexico in 1977 to the state legislature of New Mexico, it was stated, "It is now apparent that the radiological dangers of uranium exploration, mining and milling have been severely underestimated in the past and may affect populations far removed from the mine or mill site." According to the U.S. Nuclear Regulatory Commission, uranium exploration, mining and milling are currently the most significant source of radiation exposure to the public from the entire uranium fuel cycle, far surpassing other stages of the fuel cycle such as nuclear power reactors or high level radioactive waste disposal.

As a result of this study, done, by the way, by the British Columbia Medical Society, British Columbia banned uranium for seven years.

In a paper presented at the first Internation Conference of Uranium Mine Waste Disposal in May of 1980, in British Columbia, by William Paul Robinson of the Southwest Research and Information Center, it was stated that exploration work typically involves drilling. This drilling can result in the contamination of ground water supplies as a result of interacquifer contamination, besides using up all of the ground waters that is available in many areas. This has been noted in many areas where uranium exploration has been carried out. Exploration also results in surface impacts such as increased erosion and reduced vegetation. Both these ground water and surface impacts occur whether ore found is economically feasible to develop or not. Just doing exploration in itself is dangerous. I am stating this information because there are some people who feel that we should explore for uranium, even though we may not intend to follow through with mining or milling and it is difficult to understand this reasoning when it is known that exploration can have a serious impact on the health of the population. The only benefit can accrue to the companies who are doing this exploration, not to the people involved in the areas. It is obvious that the exploration, mining and milling of uranium affects the water we drink, the food we eat and the air we breathe and the effects are always detrimental to the health of children, women and men, as well as all other living things, plants and animals. They are never beneficial. There are physicians, nurses, public health officials, scientists and many others who believe that radiation of our population may cause the final epidemic. The vector of a radiation induced epidemic is not a rat or a mosquito.

The vectors are men and women from all walks of life who bring this industry to us without proper knowledge of what they are doing. Ionizing radiation from uranium exploration, mining and milling may be the greatest health hazard we have ever faced in New Jersey, and God knows, we have enough environmental problems in New Jersey at the present time. (Applause)

Ladies and gentlemen, we must have a total ban, as in Senator Dorsey's bill. As we know from the tragic history of uranium mining, regulations do not work and cannot be enforced and are therefore worthless. As to this day, the present guidelines are inadequate to protect the lives of the miners and the people in the mining areas. Remember, we have the highest density population in the nation and the highest cancer rate. When we lived with the Hopi nation, the Hopi doctors--and I keep on quoting them because they have a lot of common sense that we don't seem to have--they asked me to bring this message back to our doctors. They said that the doctors of our culture understood the concept of a life support system of sick people. When people became ill, we have the finest intensive care units in the world. We understand about intravenous fluids, we understand about medications, we understand about oxygen, we understand about catheters. But, what we don't seem to understand is that all living things require a life support system, whether sick or not sick, and in order to stay alive, we all need a clean Mother Earth, clean air and clean water. The Hopi doctors also wanted us to know that we should not fool ourselves into thinking that with our environmental arrogance, that we are destroying the earth. They stated that the earth will survive, even if it takes thousands of years to purify itself. All man will accomplish is the destruction of himself. Thank you. (Applause)

SENATOR CAUFIELD: Senator Parker, any questions?

SENATOR PARKER: No questions.

SENATOR CAUFIELD: Thank you very much.

SENATOR DORSEY: I just would like the record to show that Dr. Burnstein is a practicing physician located at Dover General Hospital. I believe you are in charge of a department.

DR. BURNSTEIN: Family practice, Chairman of the Family Practice Department. I would like to also state, in regard to that, 20 years ago when I came to this area--and it is not a matter of population, that has been proven--when we had a cancer case at Dover General Hospital, every doctor would come and review the chart. I don't know if you recall this. There weren't that many cancer cases in this area and, evidently, in many areas. There were no oncologists; there were no oncology clinicians; there were no psychologists to handle oncology or cancer cases only; there was very little cancer therapy except pain relief. Today, we have an entire field in medicine in this area. Every hospital has a cancer ward. We have one or two hospices. We have 15 to 20 oncologists. We have cancer clinicians in every hospital as full time staff and cancer is not an oddity any more.

If I may take one more minute, so that this letter will be read, Mr. Gittleson related a letter before that he though would be read by Dr. Wagoner and it wasn't. This is a letter that was written to Mrs. Gittleson by Donald L. Everhart, Director of the Department of Energy in Grand Junction, Colorado--this is a government employee--who evidently is up there somewhere in the bureaucratic chain. I will cut out most of the letter and just read to you what he said in light of what's been reported to you and all the evidence that's been reported to you, of course, by myself and Dr. Wagoner and Dr. Montague and everyone else is all documented.

"Ms. Gittleson, You and your associates are laboring under a tragic misconception. There is absolutely no inherent hazard in exploration for uranium deposits or in possible, subsequent mining and milling operations." His own state says that there is a gross hazard. "These operations are carried out daily in hundreds of localities throughout the world with absolutely no ill effects to the residents of those areas. The effects are quite the contrary. The economies of the areas are bolstered and operations are contributing to the development of uranium resources to fuel the cleanest, safest, cheapest, most viable source or energy known to mankind. The only substantial hope for the world civilization in the future is nuclear power. I plead with you and your associates to reconsider your position on this terribly vital issue and to educate yourselves on the actual facts of the situation from knowledgeable, experienced people. I urge you to discount the opinions of movie actors and actresses, professional lobbyists and others who simply are not dealing with the whole truth. If I can help with this education process, please let me know."

ASSEMBLYMAN BARRY: I have one question. Do you believe that the study called, "Study of Uranium Mining", called for in A-2020 may possibly be beneficial to those legislators that have to deal with this issue, the information that might be gathered through a study directed by the Department of Environmental Protection? Would that information be beneficial to us?

DR. BURNSTEIN: The only way it would be beneficial is if there is a stipulation that there will be a total ban and we are studying this for academic reasons and to help humanity, not if there is any possibility of this being done in this state. It is impossible to conceive from the public health issue. When I talk this way, I speak with passion and emotion and many people wind up saying that it is all emotion, but what I have to say, but what I have to say, the manner in which I say it may be partially emotional, but what I am bringing to you is not emotional. They are pure facts. If you review the issue of uranium mining of exploration and milling anywhere in the country or in the world, there is no way that anybody with any possible decency towards his fellow man can consider doing any exploration, mining or milling in this state. If you want to investigate it, education-wise and for humanity's sake, fine. But, not to consider doing it here or anywhere, but we will just worry about New Jersey at this time.

ASSEMBLYMAN BARRY: If I can read the Legislature, I would say that it is likely that the Legislature would vote for a ban, without question. I still believe that there are merits to A-2020. The information that might be gathered would be helpful in dealing with other related issues, the questions of high radiation content in some parts of our own area, Jefferson Township. I would be interested in knowing what benefits might be gained through this kind of study. Again, I just hesitate to say that A-2020 is designed to ban uranium mining. I personally believe that would be the result. However, I think the study and the concept of calling for a study before an outright ban makes a lot of sense.

DR. BURNSTEIN: Well, can't we ban it and then call for a study. I don't know why we have to live with that spector of possibly having mining.

ASSEMBLYMAN BARRY: The Committee will work on that and I look forward to the results.

SENATOR CAUFIELD: Thank you, Doctor.

SENATOR DODD: The Chair would like to call JoAnn Atlas, representing Prevent Uranium Mining Alliance of Ringwood.

J O A N N A T L A S: If I might, I would like to cut short my presentation and, instead, give the presentation of Senator Francis X. Herbert. I am his aide and I would like to speak for him. Is that okay?

SENATOR DODD: I am sure the Committee will entertain that, yes.

MS. ATLAS: This is from Senator Herbert. "I wish to express my appreciation to Senator Dodd and the members of this Committee for allowing me to make this statement through my aide, JoAnn Atlas. As one of the co-sponsors of Senator Dorsey's bill, I heartily endorse the purposes and effects of S-1492. I fear that anything other than an outright prohibition of the mining of fissionable material presents us with insoluble problems now and in the future.

"Let me offer some of the concerns which have troubled me during the past few months. First of all, I am deeply concerned by the immediate impact of uranium mining upon the quality of life in northern New Jersey. The proposed mining area is in one of the most beautiful and open areas left in the state. To envision the hoardes of trucks and equipment, miners and their families, stores and services which would inundate this area is to relive the history of many of our cities, once made prosperous by industry and now living in the dust and decay of a declining economy.

"The sociological effects of any new industry are always profound and protracted, but the effects of a short-lived uranium mining industry would be deep and lasting.

"Second, I am concerned about the long-term aesthetic effects upon our region and our state. Visitors who travel the New Jersey Turnpike already have a prejudiced and distorted view of New Jersey. Why add huge mountains of mill tailings, seething with hidden radioactive dangers? Why add empty mines and a devastated countryside to the already blemished image of this state?

"Last, I ask you gentlemen to consider the unmentionable, the long-term consequences which we will suffer when we untap the atomic bottle. We are already seeing the results of the use of Agent Orange in Vietnam. How can we possibly measure the genetic and physical effects of uranium mining upon our children and grandchildren? Much of our precious water supply is in the proposed mining area. What if we find that we cannot drink that water? Where can we possibly go to replenish our water supply? Gentlemen, speakers far more informed and qualified than I will be heard today. I ask that you carefully consider all the testimony and vote for caution and in the interest of safety. Vote to report this bill favorably."

If I may, I would just like to read a short statement of my own because I've been seething over this issue. I'm a resident of Ringwood. I'm a founding member of Prevent Uranium Mining Alliance of Ringwood. I might add also that a year and a half ago, my husband died of lung cancer. I just want to ask, where are the corporate leaders who are deciding that northern New Jersey should be a national sacrifice area? I would like to ask what mental process says it is all right to kill and otherwise destroy other people for the sake of a marketable energy source. It is a mind set that deems destruction of the planet virtuous and uses terms like "progress" and "development" the way victory and freedom were used to justify the Vietnam War. It involves the deep spiritualization of the universe, the trick being to mentally convert the victims into non-humans. So, let there no illusions about the nature of what they are doing. Thank you. (Applause)

SENATOR DODD: Thank you, JoAnn. The Chair will now call Dr. Christopher Hoy, Physicians for Social Responsibility.

D O C T O R C H R I S T O P H E R H O Y: My name is Dr. Christopher Hoy. I am a Board-certified internist and a member of Physicians for Social Responsibility. We are a group of physicians concerned with limiting the dangers of nuclear power, the spread of nuclear weapons and the threat of nuclear war. I am speaking at the request of a number of concerned citizens of Morristown.

As a physician, I deal on a daily basis with the tragedy of patients who have cancer. We are all seeing more and more of it reaching epidemic proportions. In fact, I doubt that there is anyone here who hasn't had a relative or friend die of cancer, probably someone relatively young.

Recent estimates are that 70% of all cancers are caused by environmental agents, most of them man-made and therefore preventable. I am here today to discuss one of those agents--ionizing radiation, and its relation to uranium mining and milling. I want to make three points: (1) Uranium mining and milling in New Jersey means that the population of New Jersey will be exposed to radiation; (2) there is no way to prevent that exposure, short of leaving the ore in the ground; (3) that exposure will result in significant adverse health consequences for the people exposed.

First, as Dr. Burnstein has already quoted, the NRC itself reported, "Uranium mining and milling are currently the most significant sources of radiation exposure to the public from the entire uranium fuel cycle." We're talking about two types of exposure here. The first is occupational to the miners. Dr. Wagoner has eloquently described this danger. One estimate is that 1000 of the 6000 uranium miners in the southwestern United States have died or will die as a direct result of their work in the uranium mines. There is no way to completely protect these workers.

Of more concern here is the exposure to the public. We are, first of all, exposed by the venting of the mines during the mining process. We are secondly exposed by the transportation of the enriched ore through our communities to the plants where it is fabricated into fuel rods or into bombs. The trucks are not completely shielded. So, passage near our homes exposes us to a small amount of radiation. Of course, if there is an accident, and this has happened before, and one of the trucks spills its ore an entire neighborhood can be contaminated.

Thirdly, we are exposed to radiation by the tailings of waste ore left after the mining and milling processes. There are hundreds of millions of tons of tailings in the southwestern United States and it has been estimated that these will cause and will continue to cause at least 45 new cases of lung cancer per year in the surrounding population for hundreds of years.

Last year the Morris County Medical Society stated, "If adequate standards could be adhered to by the companies and if the government could enforce them, then mining should be allowed." This is my second point. There is no way to completely radiation exposure from uranium mining. For example, background radiation levels in Grand Junction, Colorado are four times normal because of uranium mining. One Los Alamos scientist wrote, "Perhaps the solution to the radon problem is to zone the land in uranium mining and milling districts so as to forbid human habitation." Are the people of this area of New Jersey willing to move? That is the only way to prevent exposure to radiation from the mining.

Of note is that the EPA describes a model uranium mill as located in "an arid, low-population density area" with only 53,000 people within 50 miles. There would be 15 million people within 50 miles of these mines and mills. I can't think of a better experiment for finding out whether or not low dose radiation would have an effect. You certainly would have the numbers.

In addition, the industry has a miserable record of adhering to standards and the government a miserable record of enforcing them and the consequences have been serious. As noted earlier, in 1979, a tailings dam broke and 100 million gallons of radioactive water and waste spilled into a river in New Mexico. The water table of that area remains contaminated to this day. In July, 1979, the Washington Post ran an article about the contamination of the water of 15 western states with radioactivity, mostly from uranium mining and milling. In this time of severe water shortages, can the people of New Jersey even begin to contemplate the potential contamination of a number of large reservoirs and the head waters of 5 rivers with radioactive waste? I also want to mention something that came up briefly in Dr. Wagoner's speech. These substances are concentrated as they rise in the food chain. In other words, in small rodents, there 100 times more strontium or other radioactive substances than would be present in the water. This, inevitably leads to further exposure of human beings by eating the vegatables and other crops that have grown in New Jersey, one of the most important sources of those crops on the Eastern Seaboard.

SENATOR PARKER: Why is that, Doctor? Why, if you eat the grass, does it multiply when it gets to the rat and it goes up the chain? What physiologically happens?

SENATOR DODD: The same principle of mercury in fish.

DOCTOR HOY: They have a propensity to cluster or concentrate in particular tissues of the body. For example, strontium, which has similar properties to calcium, has a propensity to concentrate in bones. Cesium has a propensity to concentrate in muscle. As you eat substances that have those elements in them, the body concentrates them and as you continue to eat them, you continue to increase your exposure and you don't excreet them from the body.

SENATOR PARKER: In other words, in a human, would he throw off any of those at all?

DOCTOR HOY: Slowly. For example, the EPA, in 1977, had a study which came out with a description of the levels of strontium 90 in human vertebrae, bones, from 1950 on and there was none present in approximately 1950-1945. But, 1974, around the time of the test ban treaty, there were very, very high levels of strontium 90 present. Those have decreased somewhat presently, but, in the meantime, the people who have these elements in them are still being continuously exposed to the radiation from those substances. They are slowly excreeted, but very slowly.

Finally, if one maintains some faith in the ability of technology to solve these problems, the nearby examples of West Valley, New York and of Three Mile Island need only be cited to indicate that, at this time, we simply do not have the technology to protect us for the hundreds to thousands of years that these substances remain dangerous.

My final point is that low-dose radiation exposure is harmful. Radiation is different from chemical wastes. It is undetectable by any of the human senses. Its effects may not show up for years. Radioactive substances are among some of the most poisonous substances known to man. A microgram of plutonium, an amount smaller than a speck of dust, will cause a fatal cancer. One pound of plutonium dispersed evenly would kill every single human being in the world. These substances are active for hundreds of thousands of years. The half-life of plutonium is 24,000 years. In other words, in 24,000 years it loses only ½ of its activity.

Radiation works by breaking chemical bonds in cells. Some of these injuries are lethal, causing the death of the cell. Probably more serious are those

injuries which are not lethal, as they allow the cell to continue to multiply. Some of these result in genetic damage which may result in a deformed baby or which may be passed on to future generations in the so-called "gene pool". Others may interfere with the normal control mechanisms of the cell and lead to its becoming cancerous.

Ultimately, the issue is whether low-dose radiation is harmful. Dr. Burnstein cited many studies which showed cancer after exposure to doses of ten rads or more. There have now been many numerous studies which have shown an increased incidence of cancer after exposure to even lower dose radiation. Mancuso studies workers at the Hanford, Washington Nuclear Facility and found a 6% increase in various types of blood and tumerous cancers in workers who have never received more than the legal limits of exposure.

Bross, et all, found a correlation between the development of leukemia and previous exposure to medical X-rays.

Johnson found 500 excess cancers in people living downwind from the Rocky Flats Arsenal near Denver.

Stewart and Webb, and Stewart and Kneale found a 40% excess of cases of childhood leukemia after exposure of the pregnant mother to X-rays or of the children to X-rays while growing up.

Najarian found excess cancers in shipyard workers in Portsmouth, New Hampshire who had worked on nuclear subs, as compared to those who had similar jobs but without radiation exposure. Again, none of them had exceeded the legal limits of exposure.

Finally, Bertell, in a soon to be published study, has found an increase in perinatal mortality in infants in Wisconsin whose families live downwind from routinely operating nuclear reactors. Other studies have also raised questions of an increased incidence of respiratory infection and other respiratory illnesses, asthma and allergies.

The conclusions of these studies remain controversial for some people. To the extent that these issues are unresolved, given the very serious nature of the potential harmful effects, one can only conclude at this time that there is no known safe level of radiation. Let me repeat that. There is no known safe level of radiation. To increase the exposure of the general public at this time by mining uranium in New Jersey can only represent an unwarranted degree of optimism or a willful disregard of the public's welfare.

Each of us already has radioactivity in us from the bomb testing of the 50's, 60's and 70's and from the increasing use of nuclear power. What we are talking about here is not increasing that already significant body burden of radioactivity.

In summary then, uranium mining and milling in New Jersey will result in our exposure in radiation. This cannot be prevented and it will result in an increased incidence of cancer, congenital malformations, and danger to the existence of future generations. All of this so that a few large companies can profit and so that more bombs can be added to our already well established ability to destroy the world. Thank you. (Applause)

SENATOR DODD: Thank you. Dr. Dorothy Cinquemani?

D O C T O R D O R O T H Y C I N Q U E M A N I: I've never read a written statement before, but I decided I better this time.

Uranium mining and milling has been documented consistently as being

the most dangerous part of the entire uranium fuel cycle. When it is coupled with the already known existing pollution problems in New Jersey, it is fair to call it inexcusable to add additional problems that can still be avoided easily. Our toxic waste problem--often cited as the worst in the United States--and our nuclear waste dumps, known and as yet unknown, are already staggering in their proportions. Our cancer incidence is already among the very highest in the United States. How can we possibly add to these all but insoluble problems which will cost millions, probably billions of dollars to clean up.

When you also consider that we have an ever increasing crisis in our water supply and the additional use of water required for processing uranium, it becomes hard to believe that New Jersey would allow uranium mining and milling to occur here. What of the very high risks that significant quantities of radioactivity will enter the water used by an area all the way from Trenton to Newark?

We are often told not to worry about radiation, our government through the Nuclear Regulatory Commission will protect us. Finally, the NRC, in 1978, admitted there is no safe dose of ionizing radiation, no "threshold". It is especially insidious as it cannot be seen, tasted, smelled or touched and except in large doses, operates slowly but inexorably in creating serious or lethal health problems. As radiation's effects are largely cumulative, the background radiation is supplemented by our frequent dental and medical exposures. We must not be subjected to additional totally unnecessary exposures and thus further increase our cancer and genetic defects.

We have been told that nuclear power plants are safe. Yet, there have been many, many incidents, transients or whatever you care to call accidents, a number of which were near total. Among the most potentially total disasters have been Chalk River, Ontario, where a partial fuel meltdown occured, releasing over a million gallons of radioactive water; the Idaho Falls ERB-1 reactor which went out of control resulting in nearly half the core being melted; the SL-1, also at Idaho Falls, which killed three men when it went out of control. It was dismantled, yet after months of study it was unclear as to what exactly had gone wrong. The Fermi reactor near Detroit suffered a partial fuel meltdown. It has never returned to operation and as one Fermi Project engineer said, "Let's face it, we almost lost Detroit." The Dresden II Nuclear Power Plant in Morris, Illinois was out of control for two hours and additional problems surfaced during repairs. The Atomic Energy Commission in their "Nuclear Safety" stated, "It is unfortunate that procedural, mechanical and control inadequacies can be recognized only upon the occurence of some incident that puts them to the test." It was the emergency core cooling system. The Browns Ferry nuclear power plant near Decatur, Alabama suffered a fire that burned for seven hours and destroyed 1600 control cables, many connected to safety devices, including the emergency core cooling system for Unit 1 of the twin plant. It, as well as the more famous Three Mile Island 2 accident came close to total core meltdown and TMI 2 may yet go critical again and the wind could carry the radiation over New Jersey. These are just some of the most dramatic near total disasters in North America. There have been others in England and European Continent, not to mention, of course, in Russia, about which we hear very little. I bring these examples up to illustrate that the nuclear industry is not safe and to reiterate that uranium mining and milling is the most dangerous part of the cycle on a daily basis.

It is true that we can learn many lessons about how not to mine and mill uranium from past practices in the American Southwest. However, even with the

most strict regulations and very expensive enforcement, which would be money much better spent for other things in New Jersey, the operations could not be monitored constantly, even if we assume that the companies did not cut corners to save expenses, and this is a most unlikely assumption, as making a profit is the number one goal of commercial enterprise. Radioactivity can escape inadvertently as the number of power plant accidents attest to only too clearly.

The economy of the regions involved would suffer in so many ways. For instance, recreation areas do not attract people if they are known to be the site of dangerous mining and milling of uranium. A relatively small number of jobs would hardly balance the economic losses. Only the few large corporations would really profit.

And, what of the increasing level of physical, emotional and economic suffering that the increased medical problems would cause both individuals and families? And, it would not stop there. Medical costs to local as well as state government would increase tremendously.

Vermont, a state with a much lower total population and population density, as well as a much more depressed economy has banned uranium mining and milling. Are we, the citizens of the most densely populated state, to be less protected? Are we to become a "sacrifice area" for the U.S.A.? If we permit this mining and milling in New Jersey, it should encourage the federal government to choose our state as a repository for permanent nuclear waste storage. After all, if we do not care enough about our citizens to protect them from the beginning of the fuel cycle, why should the federal government protect us from the back end of the fuel cycle?

Last, but certainly not least, from an ethical standpoint, how can we possibly justify inflicting not only on ourselves,but also on future generations for thousands of years, the totally unnecessary devastating effects of uranium mining and milling? Future generations are not only not consulted, but are inflicted with all the negative without any of the possible minor benefits of the nuclear fuel.

Therefore, I call upon you to truly represent the strong sentiments of the New Jersey Citizens's Party and other New Jersey residents and strongly support a total ban on uranium mining and milling in New Jersey. Thank you. (Applause)

SENATOR DODD: Thank you, Doctor. I think this would be a good break time for us to get lunch. We will resume at 1:45 promptly.

(at which time a luncheon recess was taken)

AFTERNOON SESSION:

SENATOR DODD: Judith Howard, Stop Uranium Now.

J U D I T H H O W A R D: Good afternoon, ladies and gentlemen. Thank you for coming and thank you for listening to us, the citizens of the area that is involved.

Our group, the SUN Organization, Stop Uranium Now, is a relatively new organization made up of citizens from Jefferson Township and surrounding areas. We are partially responsible for the initiation of S-1492. It was through our visit with Senator Dorsey several months ago, and we advised him as to how we would like to have the bill written up. This bill is written through a citizen input, whereas A-2020 was written by a legislative service. So, therefore, we have the feeling that S-1492 is more applicable to the citizenry of the areas involved and also the areas of New Jersey.

It is interesting to note that Senator Dorsey was here to represent his bill, whereas Assemblyman Jackman's lack of presence was quite obvious. I, too, live less than two miles from the proposed sites. We have tried to be an education organization, and we pride ourselves in the fact that we have educated many people. Senator Dodd, we have sent you packets of information and members of your committee, and we have visited with the President of Sohio, Hugh Evans, and we spoke with him for nearly three hours. We have been to Sohio on top of the mountain, the location of the site of the proposed uranium mine. We have, of course, been with Senator Dorsey, Assemblyman Barry, and Assemblyman Jackman.

Gentlemen and ladies, I would like to read to you at this time our statement for the day.

SENATOR DODD: That wasn't the statement?

MS. HOWARD: No, that was just my introduction. The Stop Uranium Now Organization of Jefferson Township urges you to consider the detrimental effect of uranium mining within the State upon the health and safety of its citizens who consume the surface and ground waters and breathe the air within their airshed. Today we are more aware than ever before that man's intrusion in the watershed and airsheds is producing unnatural and destructive reactions affecting our health and food chains. We, the cancer state, are also painfully aware that the burden of proof rests with the technologists, but the price of accountability both physically and financially falls on the public.

Our position remains the same - uranium might have its proper place in the far future, but right now we feel that man just does not have the technology to extract or use this energy source safely. And more importantly, the integrity of the oil companies, regulatory agencies, and some legislators on all levels is just not there to protect the concerns of the citizens of today and those of future generations.

The people's voice of opposition and desire to have a statewide ban is loud and clear. Over 13,000 signatures have been obtained by petition and the following towns which was stated earlier, so I will not read them, have also put through bans or resolutions, and various mayors have written to our mayor of Jefferson Township supporting, though not passing,legislation. These figures do not include the many organizations that have also written resolutions or expressed support to the same, such as the Morris County Health Association, the North Jersey District

Water Commission, the Upper Raritan Watershed Association, Upper Rockaway River Watershed Association, Pumo of Ringwood, Puma of West Wilford, Perg, SUN, Rise, SEA, Weiss Ecology Center, New Jersey National Organization of Women, New Jersey Tenants Organization and many others as well.

The costs both now and in the future are of great concern to us. Charles Rate, the State Geologist for Vermont summarized his report following a trip to the Schwartzwalder Mine in Golden, Colorado, in February of 1979, with the following statement:

"One last significant fact that was impressed upon us by Colorado officials was the value of having more stringent state laws and regulations - than those imposed by federal agencies - which then enable a state to become an"agreement state." However, in order to accomplish this, a state must be prepared to finance and equip the extraordinary staff and facilities required to enforce, regulate and monitor the industry. They choose wisely not to allow this industry to demand such a burden be placed on their taxpayers."

On October 3, 1980, final regulations of Uranium Mill Licensing Requirements, U. S. Federal Register 45 FR 65521, were issued reflecting conclusions of the final Generic Environmental Impact State on Uranium Milling - NUREG -0706, Vols. I, II, III - and provisions of the Uranium Mill Tailing Radiation Control Act, include requirements that assure, among other things, that "Unless determined to be unnecessary to protect the public health, and safety and the environment, as may be the case in rare circumstances - such as may occur with deep burial where no ongoing surveillance will be required - disposed tailings and the lands used for such disposal are required to be transferred to the State or Federal Government for long-term custody, upon license termination. Do you choose to put this burden on the present and future citizens of New Jersey?

Our organization, as well as the populace mentioned previously, cannot in any way accept the proposed legislation as stated in A-2020, as New Jersey is not an "agreement" state - in accordance with Sec. 274 of Atomic Energy Act of 1954, providing for the discontinuance of the Nuclear Regulatory Commission's regulatory authority. Therefore, we would have to abide by the regulation stating the State must be responsible for the mill tailings once the Company licensed to mine leaves, as well as come under the following rulings: NUREG - 0706.

A. Emissions of radioactive materials and other contaminants will be as low as reasonably achievable during milling operations.

B. Prior to license termination, all site areas and structures, with the exception of areas devoted to tailings disposal, are decontaminated and decommissioned so as to allow unrestricted future use;

C. Prior to license termination, all areas devoted to tailings disposal are reclaimed so as to ensure long-term physical isolation of the buried wastes, and reduction of residual releases of radioactive radon gas to levels within the normal range of those arising from natural background radioactivity in natural soils;

D. As a condition of their license, mill operators are required to provide effective financial assurance that sufficient funds are available to satisfy detailed tailings disposal and mill decommissioning requirements.

Again, at tremendous cost to the taxpayers of New Jersey, you would have to establish a new "empire" to establish and monitor those volumes of Federal

regulations and/or become and "Agreement State" creating our own "Monsterous Bureacracy."

A long time ago Albert Einstein said, "The splitting of the atom has changed everything save our modes of thinking, and thus we drift toward unparalleled catastrophe."

Expert testimony was what was called for today. All of the aforementioned populace are experts. Expert as defined by Webster's: 1. experienced; 2. having, involving, or displaying special skill or knowledge of a particular subject through training or experience. They are experts at some of the following: eating, breathing, drinking, paying taxes, owning homes, being parents, living and voting. Under the United States Constitution we all are guaranteed the right to life, liberty and the pursuit of happiness. Because radioactivity can be created, but can never be eliminated, if uranium mining in any of its stages were to take place in our state, it would surely take away these Constitutional rights.

There is not a place in the world where uranium exploration began, that mining did not follow, except perhaps Vermont. It will be your decision and action that will determine whether New Jersey will be willing to prohibit this activity. We pray that the members of the State Energy and Environment Committee agree to keep our air and watershed free from any adverse use or pollution due to uranium exploration, mining, or milling and demand that this sensitive watershed and airshed remain unexposed and protected from such haphazard, unnecessary, and detrimental development anywhere from within our State.

Gentlemen, I would like to leave you with one brief and final statement that summarized the feelings of the majority of people here today both in body and spirit - uranium, leave it in the ground. Thank you.

I would like to make one other brief statement, if I may, Dr. Wagoner's statement about radiation in the highlands watershed, would it be at all possible to initiate a federal and/or state grant be immediately available for us, the populace, to determine whether we do have radioactive water within our wells?

SENATOR DODD: The Department of Environmental Protection, upon request, will test for this. (Applause)

Thank you very much, Judith. We are going to break at three-thirty. We all seem to be going in the same direction. I have yet to see our first representative from any industry to counter any of the statements or from the experts, or your personal feelings on this issue, which is why we are here. We have thirty-two listed additional speakers. Now, out of courtesy to hear as many as people and as many viewpoints as possible, those of you with prepared statements, if you would submit them, and they will be read into the record and published, please give your comments to us, in courtesy to the others who would like to be heard today.

With that in mind, I would like to call on Susan Sergey, Middlesex Mental Health Department.

S U S A N S E R G E Y: I will be brief. I represent the Borough of Middlesex. I am employed by the Middlebrook Regional Health Commission as a Sanitarian for the Borough of Middlesex. My testimony here today is probably something a little different than you have heard before, because Middlesex has a serious problem, which people are just not very well aware of. I am not here to give you technical expertise as to what the problems can be with uranium mining, but I am here to share with you the factual account of what has happened in Middlesex directly as a result of uranium milling, an enterprise which consequently

occurs along with uranium mining. In 1943, the United States Government, as a part of the now defunct Manhattan Project, began refining crude uranium and thorium ores at the site known as the Middlesex Processing Plant. This program continued until 1955. The mill tailings were deposited on this site adjacent to seven buildings which are used for offices and processing. The site was then sold to the United States Marine Corps which used it as a training site for reserves until 1978.

Comparatively little was known about the effects of radiation in 1943, and consequently few precautions were taken in handling the crude ore and the mill tailings which were left after processing. Sometime during the processing years, 1943 to 1955, the tailings which were considered nothing more than waste at the time, were removed by area contractors and used as fill in various sites in Middlesex Borough in the Township of Piscataway. It was not until the mid 1960's that the contamination of off-site properties was discovered. A Civil Defense drill on a municipal landfill site in 1963 was progressing rather routinely until geiger counters started going off scale. At this time, again, Middlesex has struggled to determine the extent of the contamination, the deleterious effect it may have caused to health and environment and the agent responsible to remove the dangerous substance from its midst. It was not until July of 1980 that excavation finally began at the most contaminated site. This was done under the auspices of the Department of Energy. The radioactive soil which has been excavated from a number of offsite locations still sits at the original processing plant site with a rubber and asphalt pad. There has been no data given to us by the United States Government for the removal of this contaminated soil from Middlesex Borough. To date the government has spent from three to four millin dollars for the monitoring of radiation and the excavation of radioactive soil. This figure does not even take into account the cost of time spent by a government official in the Department of Energy on this problem. All this, because in 1943 no one could foresee the potential problem for handling uranium ores. There are many unanswered questions concerning the effects of the levels of radiation that has been present in Middlesex for the past forty years. We do not know if the effects have been at a local cancer rate or death rate. The government has not done any comprehensive study to this date.

We do not know all the harmful effects that this has had on our environmental quality. Most of the environmental measurements that have been taken have been done within the past four years. There is no telling what those readings would have read, twenty, thirty or forty years ago. What we do know is this: Middlesex Borough and its residents have been profoundly and irreversibly affected by the presence of radioactivity within its boundaries. The effects have been economic. There is still land that is adjacent to the processing site which is not and may never be desireable for development. The economic effects have been very expensive. The federal government, as I have stated, has already spent from three to four million dollars and will continue to spend money to "clean up the radioactivity and monitor its presence there for an undeterminable period of time."

The municipality has been required to spend a great deal of time and money in an attempt to protect the health and welfare of its residents. By pursuing the issue of having this radioactive contamination removed, the effects have been environmental. Government officials do not believe there to be a

serious hazard at present, but admit that a lack of data from previous years and lack of data currently seriously weaken the credibility of that claim. It is clear seeing the testing that has already been done - some of which has been done in wells, and these wells are residential wells, and people are living directly adjacent to this site - so that radium is in their drinking water anywhere from one to one hundred times the recommended levels. There is no way to determine how far this contaminated water has traveled, nor how high the levels may have been in previous years, although it seems clear that levels must have been higher when the mill tailings were present at the prospecting site, and leaching directly into the ground water system. Usage of the mill tailings for fill meant that not only was the processing site eminating radioactive nucleii, but so was the municipal landfill and two residential sites within a mile of the plant. As to what effects these additional sites may have on the environment one can only guess. Radon gas, the decayed product of uranium and thorium has been measured at outdoor levels from two to ten times the background level. Indoor levels of radon in occupied residences have been as high as 100 times the recommended level. And, in case this hasn't been said before, radon inhalation causes lung cancer.

Gamma rays, which are similar to X-rays have been found at the site at 20 to 50 times the background levels. Drainage and runoff water from the site flows into a feeder stream which reaches the Raritan River and canal within two miles. The Raritan River at that time was used for drinking water, and to this day will be used for drinking water. In 1978, the drainage ditch along the site was found to be at such a high level of radioactivity that the area was immediately fenced in to prevent area children from any further exposure. Clearly there is a relationship between the presence of the mill tailings and the increased radioactivity in a given area. The few parameters which I have mentioned here are merely a brief illustration of the scope of the problem. The effects of it cause great stress and anguish. Since I began working in Middlesex in early 1979, I have spoken to hundreds and hundreds of residents who are all very concerned about what has happened in their town and what those effects might be on them, especially those residents who lived there for a long period of time. I have no assurances to offer. It may be another twenty years before we can say by looking at such morbid statistics as the death and cancer rate just what the effects have been.

Just this past Friday a man came into my office who lived directly behind the processing site. He said for years that he had eaten blueberries that were in the runoff water from the plant, and used the tailings as a play site. He expressed concern about his welfare, and the more than likely high dosage of radioactivity he had been exposed to for years, for he knows fully well that only time will tell just how deleterious the effects of this exposure heave really been.

To members of the Committee, I have stressed today the facts which we do know and those which we do not know. I hope that one thing is very clear. Middlesex has and will continue to pay a very high price for having within its boundaries the substance which was not very well known in 1943, but which affects our very home at present. And, now almost forty years later we are still dealing with the effects which will in the end have fostered a tremendous amount of dollars and time, an inexorable amount of environmental quality, and will cost us the

inevitable quantity of decreased health and shortened lives. We have painfully learned this lesson. It is not necessary for any other municipality, region or county in the State of New Jersey to have to deal with this problem again. We will continue to deal with these effects for an untold number of years. As long as known radioactive soil is stored in Middlesex, there is always a possibility that there will be greater and increased exposure in the future. This problem cannot be wished away nor bureaucratically discarded. The Borough of Middlesex nor any of its residents would desire for any other town to enjoy the magnitude and the scope of the problem which the presence of uranium mill processing has caused it. The hindsight we have gained in looking back at the seriousness of the radioactivity, we can clearly see that the only solution to the problem is to prevent this from ever happening again.

As a representative of the Borough of Middlesex, and as a public health official, I hope that his testimony has illustrated to each of you not only what can happen, but what already has happened. I thank the Committee for the opportunity to speak, and the Borough and Health Department are at your disposal for any further information. (Applause)

SENATOR DODD: Susan, I don't know if you are aware, but this Committee has done,for the last six months, extensive work on our hazardous waste bill which is now in final form, and as a matter of fact, you have two landfills in your county that were classic cases of neglect, Kimbuck and the Jandis landfill. The toxic waste problems that we have heard over the last six months are not dissimilar to what we are discussing today, except this lasts quite a bit longer. The similar situation which we can adjust to now is the water quality that it immediately affects. But, the uranium certainly over a long-term period is much more dramatic.

Again, thank you, and your county is to be complimented on the action that it has taken on the toxic waste problems.

MS. SERGEY: I can tell you in addition, I understand that as part of one of the bills, it would be the Department of Environmental Protection's duty to regulate the uranium ore mining, and any kind of health effects and environmental effects that went along with it. I can tell you from my experience as a sanitarian and with this problem that I would be extremely hesitant to even consider the Department of Environmental Protection to do that at this time, because it just doesn't seem they can handle what they have to do right now. (Applause)

At no time have they been regulating any of this. It was done in Middlesex only as a subcontractor of the Federal government.

SENATOR DODD: Well,Kimbuck was supposed to be monitored right along.

MS. SERGEY: I am representing Middlesex Regional, which is not quite the whole county, so--- It is a little bit smaller. Thank you.

SENATOR DODD: Thank you. I would like to call Dr. Judith Johnsrud, New Jersey Coalition to Stop Uranium Mining. (Applause)

D R. J U D I T H J O H N S R U D: Senator, my name is Judith Johnsrud. I am Co-Director of the Environmental Coalition on Nuclear Power, which is a multiple-state organization of citizens concerned about the entire nuclear fuel cycle and alternatives to the use of nuclear energy.

I am a member of the Pennsylvania Governor's Energy Council Advisory Committee, and on the sunnier side of things, the Vice-President of the National

Solar Lobby, trying to get solar legislation in place. I hold a Ph. D. degree in the field of geography from the Pennsylvania State University who have specialized in the geography of energy and particularly nuclear energy and the nuclear fuel cycle. That concern in Pennsylvania, a state that has been blessed with a great many reactors, with a rather uneven performance to date, has led me to my particular concerns with matters that go beyond the actual functioning of a nuclear power plant - most importantly, those aspects that relate to the beginning and the end of the nuclear fuel cycle.

In my capacity as the legal representative for the Environmental Coalition on Nuclear Power, along with Dr. Chauncey Kempford who is a radiation chemist, I represented the public interest as the sole intervenors in the operating license for Three Mile Island Unit Two, and there is ironically a connection between that severely damaged reactor and the problem that you are addressing today. The connection is very simply this: TMI-II was allowed to go into operation in the absence of a completed license. The issue that remained unresolved when the plant was allowed to start was the issue of the quantities and the health effects of uranium mining and milling and the mill tailings piles that remain following the conclusion of milling activities. It is, in fact, the issue that you are hearing today that radon 222, emitted from uranium mill tailings piles into the atmosphere to become part of both an inhalation dose for those who live in the immediate vicinity of the plant, and even more significantly, an ingestion dose, a matter that I think is frequently not quite understood. If I am repeating things that you have heard and fully understand, please cut me off, and we will move on to another aspect.

The significance of the ingestion dose, of course, lies in the fact that the radon gas, which is emitted from the uranium mill tailings piles, from the fine sand, is allowed to disperse then into the atmosphere and in its 3.8 day half life, disperses down wind, decaying through the short-lived radon daughters in to lead 210, and the lead 210 with a half life on the order of 22 years has been available for take up in the grain crops that are grown in the entire food producing interior and eastern portions of the United States. Now, the amounts of radon emitted are quite small each year from each mill tailing pile that is produced in order to produce the fuel to run a single reactor for a single year, and therefore, in the eyes of the regulators, this amount of radon associated with a single fueling of a nuclear power plant is what they term deminimum, latin survives at least slightly. But, in what I would have to say, a perverted form.

And, now, I will go back to TMI-II. Ordinarily in the licensing of a nuclear facility, the full nuclear fuel cycle effects that are consequent on the operation of a single reactor are not allowed to be considered. This was done in a perfunctory, three-day proceeding in 1973 by the then Atomic Energy Commission in a generic rule making hearing that had no sworn testimony, no cross-examination of witnesses, merely declaratory statements about the safety of the nuclear fuel cycle. Out of that proceeding in 1973, there subsequently developed a standardized table that applied to each nuclear power plant in the course of its licensing. That table in the code of federal regulations referred to as Table S-3, 10CFR Part 51.20E, if you would care to examine it, includes supposedly all of the environmental impact associated with a single year's operation of a nuclear power plant.

Strangely, in the course of the Three Mile Island license proceeding in 1977, the Nuclear Regulatory Commission staff raised the testimony to compare

the fuel cycle health defects associated with nuclear power compared with those associated with the coal fuel cycle, a power plan of comparable size. In the course of our examination of the NRC's testimony, we discovered - Dr. Kempford discovered - in fact those regulations, Table S-3, contained a recognition of only the first year's release of radon gas associated with the operation of the plant for one year. The amount was 74.5 curies of radon per year. However, the NRC had simply ignored the fact that the year later another 74.5 curies of radon would have been emitted, and the year after that, and the year after that, ad infinitum. Therefore, it appeared that the environmental effects and the health effects of the radon were very minimal, extremely small.

However, if we now go back - as Dr. Kempford did in that proceeding - and begin to add up the number of curies per year for the full detoxification period, we find that the radon gas associated with uranium mining and milling - and we are talking here just about those mill tailings - becomes the largest single source of radioactivity in the entire nuclear fuel cycle over the full period of toxicity.

Now, perhaps a bit of history here would be in order, namely, in 1975, it was Dr. Robert Paul a Cornell University Physicist who had first raised this issue of the longevity effects of the radon. He, in turn, was followed by the petition to the Nuclear Regulatory Commission that same year by the New England Coalition on Nuclear Pollution to take into full consideration the effects of radon and other long-life materials. That petition was not touched until the TMI proceeding. Now, Dr. Paul had been looking at the immediate precursors of the radon. For, we must understand first that the radon is preceded by a 1600 year half life, radium 226, which in turn was preceded by the thorium 230 with an eighty thousand year half life, both of which are in toto remnant in the uranium mill tailings. However, Dr. Paul had not gone back to what is in fact the long-term source in those mill tailings, namely, the residual amounts of uranium 238 that are not removed in the milling process. It is simply not economic to get all of it out. So, generally, the mill tailings are still contained on the order of 5% to 10% of the original uranium content.

Now, because U238 has a half life of four and a half billion years, it is reasonably safe to say that the radon gas associated with the mill tailings piles from uranium mining and milling will remain - or I should say will continue to be emitted to the environment forever.

Now, the NRC's assumption, you see, said that only one year was to be considered. Had the NRC honestly admitted to the full magnitude of this problem, they would have had to count not 74.5 curies of radon, but rather many billions of curies, over that full detoxification period. Subsequent to the licensing proceeding for Three Mile Island, Dr. Kempford took this issue to the U. S. Court of Appeals for the D. C. Circuit in 1978, a full year before the TMI accident occurred. By a split vote, the court failed - by the vote of only one judge - to declare invalid the TMI license. And, the plant was allowed to operate. However, Judge Skellywright took this issue under advisement, requested of the NRC that it complete appropriately a full environmental impact statement of the long-term effects of uranium mining and milling. While a final environmental statement has been published, it nonetheless does not address the full detoxification period. Of course, I would remind you that NEPA, National Environmental Policy Act, does require that we do consider all pollutants assosicated with a major

federal action such as the licensing of a power plant. In this instance, NEPA gives no cutoff date, and in two separate decisions,one from the Circuit Court of Appeals in 1976, and again from the Supreme Court in 1978, we have the very clear guidance that the courts intend that NEPA must consider the full detoxification period. That is their wording. So we must look at the long-term impacts of a nuclear power plant, and in this case the impact of mining and milling associated with it. That issue remains unresolved.If you look at the code of federal regulations today in Table S-2, you will find that there is a blank where the number for radon should be, and it was in fact in consequence for the issue raised in the TMI-II proceeding that this blank remains, which is to say that the NRC has yet to date been willing to recognize the full magnitude of the radon emissions associated with the operation of even a single nuclear plant for a single year. Obviously, there are many other sources of radon that would be associated with the uses of uranium that might potentially be mined here in New Jersey, weapons program, possible industrial source used, that give us cause with respect to this issue, so I do want to clarify that my concern here far transcends that of a single power plant, although I put it in that context, because that is the way the NRC has dealt with it legally. They have not done a complete NEPA review of the impacts of uranium mining and milling.

However, not long ago rules and regulations ostensibly governing uranium mining and milling were in fact published by the federal government. Within the last six weeks, the Tenth Circuit Court of Appeals in Denver has received and consolidated for consideration three petitions for review of those federal regulations governing uranium mining and milling, and because the regulations in question are considered by the miners of uranium to be "arbitrary and capricious, unsupported by the evidence, and not in accordance with law, and because those regulations exceed the authority of the Nuclear Regulatory Commission," the uranium mining companies are asking that the Federal regulations to govern uranium mining and milling be set aside in toto - in other words, that they be allowed to continue the practice. That has exemplified the mining industry for uranium these many years, namely, to be allowed simply to mine, to mill, and to walk away from the remains. Now, if you are up for a little levity, Dr. Kempford refers to this as the pussycat method of radioactive waste disposal. For, if you are acquainted with pussycats, the tendency of the mining companies thus far has been simply to scratch a little dirt over the mill tailings pile in the hope that that would cut the emissions, and simply leave.

I am sure that you have heard the evidence from other speakers today of the uses of the mill tailings, the erosion of mill tailings piles and so forth. When I visited the Edgemont Mill in South Dakota, which is a TVA facility now, I found that the management was even unwilling to allow outsiders to examine the condition of their mill tailings. It was reasonably evident from a cursory examination outside the fence that very little cover protection was being offered and certainly while the regulators in the east may assume that scattering a little grass seed on a mill tailing pile is going to result in a lush, dense, vegetation to stabilize it, those of us who are acquainted with the western states in even the most minimal way are well aware that it is pretty tough to make any grass grow out west. Some of us have even found in the drought this past summer that it is pretty tough to get much grass to grow here in the east.

Even the optimistic assumptions of the cover of uranium mill tailings, I find to be unrealistic. The 15-foot cover that is required is certainly not adequate for the duration of time that we can anticipate the release of radon to contain. We are talking about geologic time. And, we are talking, therefore, about people' of the future. In the course of the TMI proceeding, Dr. Kempford compared the numbers of health effects which is the euphemism for death of human beings, premature death from cancer, leukemia and other radiation related diseases. Dr. Kempford compared the numbers of deaths that we could anticipate if the U. S. population was to remain no larger than it is today, 225 million and projected that into the distant future, it is not a trivial number. It is in fact, by the minimal estimate, in excess of one million human deaths in the future in consequence of each year's fuel supply for our nuclear power plant. Now, that was based upon the data that the NRC has provided and the dispersion models that the Environmental Protection Agency had made available. In fact, subsequently, the Nuclear Regulatory Commission has indeed admitted that the numbers of curies released from each mill tailings pile is substantial, at least 25% larger than they had indicated in 1977; they have further admitted to comparable numbers of curies released per annual fuel requirement per reactor from uranium mines.

In summary, I think we are on reasonable ground to assume that the Federal government is not going to do an adequate job of regulation or of prevention of the release of radon. It takes a good hundred foot cover to reduce the emissions to zero, at least according to the Environmental Protection Agency studies. Maintaining such cover over the period of longevity involved seems problematic at best. The way that the Federal agency has attempted to by-pass this problem, then, is, as I said before, to declare it de minimus, which is to say minor compared with naturally occurring sources of radon. And, to this point, I would address your attention that we are finding increasingly that other sources of radon are present in our environment. Much of EPA's work over the past several years has been directed toward radon in the home, radon in stone buildings, concrete block, the work place, as well as home, for most of us.

Therefore, we are already receiving in our customary lifestyle a pretty substantial dose with an impact that I am sure has been addressed to you by Dr. Wagoner and by others today. The quantities of radon that would be associated with uranium mining and milling must be looked upon as additive, as having their primary impact upon the people who live in the immediate vicinity of a mining or milling facility, and as cumulative over a very, very long period of time. I spent a good dozen years of my life dealing pretty intimately with the operations of the Atomic Energy Commission and the Nuclear Regulatory Commission. I must say to you that I am not in the slightest encouraged about their willingness to learn the lessons of safety that should have been learned from the TMI accident. And, in fact, I would like to point your attention to a move that I think definitively explains a major shift in policy by the Nuclear Regulatory Commission within the past four months.

I have given to you a copy of a letter of mine that was published in the New York Times December 20th. Do you have a copy of it? It clarifies in our minds the shift in regulations taking place within the NRC to resolve the problems of low level radioactive waste that are being produced in rapidly accumulating quantities from other aspects of the nuclear fuel cycle and from the use of medicine and research - radio isotopes. The intent of the NRC is

very clearly to allow the de-regulations of these wastes, the dispersion of these materials into ordinary landfills and in the case of smelted alloys and in the future other metals associated with the nuclear industry, the recycling of contaminated materials into a large range of consumer products.

I bring this to your attention partly because I am sure that you will all be pretty concerned about landfills in New Jersey having even more radioactivity added than you have already been getting, from my understanding, and because I am sure you are equally concerned with the dispersion in consumer products of contaminated metals and smelted alloys. To me it is a very clear indication that the NRC has no intention whatsoever of sufficiently providing for prevention of the release of either these materials or the radon which constitutes an enormous source of low level radioactive waste, if you will, into the environment with subsequent detrimental effects for human health. Therefore, representing the members of our organization who live here in New Jersey as well as citizens elsewhere who are going to be affected by the dispersion of radon, I would strongly urge your adoption of S-1492. I can only say, although I do not represent the views of all members of the Governor's Energy Council or its Advisory Committee, I can only say I wish we had such a bill as close to passage in the Commonwealth of Pennsylvania as you seem to have here in New Jersey. We would appreciate having you lead the way, and we will do our best to have our Pennsylvania legislators following along with you in the interest of protection of the public health. Thank you very much. (Applause)

I have one embarrassing note. I got into my car to go to a meeting last night in the Philadelphia area, and got halfway here and realized that I had left all the supporting materials in the middle of Pennsylvania. I didn't go back for them, but with your permission, I would like to send some of the documents that back up the things that I have been saying to you today.

SENATOR DODD: We would appreciate that. If you could send over some coal from Pennsylvania, we would also appreciate that.

DR. JOHNSRUD: I will work on that.

SENATOR DODD: Thank you, Doctor. Mary Berger Miller, Sea Alliance, of Somerset Hills Peace.

M A R Y B E R G E R M I L L E R: I am probably the grayest headed woman here. I have seven great grandchildren to prove it. My paper is scratched up. I was deleting everything that everyone else said, and that left me with not much to say.

SENATOR DODD: I feel the same way many times, Mary.

MS. MILLER: The name of this place is very appropriate for today's meeting. It is the Freeholder's room and as free citizens it belongs,or it should belong,to us, not to Exxon or Sohio. I suppose that is because they have not gotten around to leasing it yet. (Laughter)

The end result of uranium mining can mean a giant radioactive cancer cocktail that fills our rivers and reservoirs and runs from the tap in our kitchens. We would then drink radon 222 in our orange juice, feed it to the baby in his milk, bathe in it. What we are talking about here goes far beyond the boundaries of this State. We are talking about more Three Mile Islands, more hydrogen bombs, more red alerts, more cancer, more inflation. Every utility bill you pay is loaded with costs resulting from human error and computer malfunction. Albert Einstein said, "With the cracking of the atom everything changed, save our mode

of thinking." And, thus, we drift toward unparalleled catastrophe. Today we are no longer drifting; we are rushing toward catastrophe. Because of the one megaton bomb we dropped on Nagasaki, thousands of Nagasakians are still dying of cancer. Today we have bombs that run as high as thirty megatons. Like Vermont, we need a statewide ban on uranium mining and we can hope that a majority of other states will ban mining and all other nuclear operations too. (Applause)

SENATOR DODD: Thank you. I call on Linda Searles, National Organization of Women Against Nuclear Power Task Force.

L I N D A S E A R L E S: My name is Linda Searles and I am here representing the Women Against Nuclear Power Task Force of the National Organization for Women in New Jersey, and the 5000 members of our organization.

NOW-New Jersey is unequivocally opposed to nuclear power and every facet of a nuclear fuel cycle including the mining and milling of uranium. We have initiated a petition campaign in the past two weeks and already have several hundred signatures of New Jersey residents demanding that uranium mining and milling be banished in this State. With our membership of 5000 women and men working to further educate New Jersey residents as to the hazards involved with the mining and milling of uranium, we expect to obtain several thousand signatures in the next few weeks and we are but one of the many organizations in the State working at this campaign - most of whom are represented here today.

The National Organization for Women fights for the right of women to control our reproductive lives. The mining and milling of uranium denies us our freedom to choose by increasing the chances of sterility, miscarriages, genetic diseases, congenital deformities in our children. Pregnant women are especially vulnerable to the adverse effects of radiation. The rapidly dividing of cells of an embryo or fetus are readily damaged by radiation. This is why pregnant women and small children were advised to evacuate Harrisburg during the Three Mile Island crisis. This is why health clinics around Harrisburg were crowded with worried women seeking advice concerning their reproductive options.

The National Organization for Women supports and works for health and safety in our communities and work places. We recognize that the radiation produced in the nuclear cycle is a threat to our health and to worker safety. Uranium mining and milling releases the radioactivity contained in uranium into the air and water and then into the food chain. Again, every doctor has attested to this today. We know that this added radiation would bring greater risks of lung cancer and birth defects among minors, their families, and those living near the mining and milling facilities and/or using the contaminated waters.

In February of last year, the National Organization for Women, which is the largest feminist organization in the world with more than 100,000 members, adopted a resolution in favor of safe energy alternatives to nuclear power. This national position opposes all facets of the nuclear cycle, including uranium mining. NOW-New Jersey adopted a resolution calling for the banning of uranium mining and milling in New Jersey just this past November. We support Senate Bill 1492 and feel that the only safe and economical thing to do with uranium is to leave it in the ground. Thank you. (Applause)

SENATOR DODD: Thank you. Kathy Hall.

K A T H Y H A L L: My name is Kathy Hall. I am not a doctor, and I am not a lawyer, and I am not running for President. I am, however, a native New Jerseyan

and I am somewhat of a New Jersey chauvinist. I am also a very concerned voter. I live in Union County, which is the next county from Morris County, and I am here today basically as a private citizen to register my concerns for the notion that we would do uranium mining in New Jersey. The experts have already testified to the incredible problems of radiation, the incredible problems of waste disposal, probably later on there will be testimony as to the incredible problems of the economics of uranium mining.

On a more personal level, I am one of those statistics who got cancer from radiation. It was done by a doctor during radium treatments. He did it in good faith, but I still have the emotional problems from it. The cancers that will come from the radiation from uranium mining is not being done in good faith, and I feel very strongly that the Committee and hopefully the Senate and the Legislature of New Jersey will help to prevent at least partially this cancer epidemic and not allow uranium mining in Morris County or in New Jersey at all. Thank you very much. (Applause)

SENATOR DODD: Julie Ryan Leed.

J U L I E R Y A N L E E D: My name is Julie Ryan Leed, and I am eight months pregnant, so that stands to speak for itself, I think. I am a supporter of Senate Bill 1492 as opposed to the S-2020 bill, because I think the fines are too low in the S-2020 bill. (Applause)

SENATOR DODD: Thank you. Ronnie Kleinhans, Somerset Hills.

R O N N I E K L E I N H A N S: We of Somerset Hills Peace strongly support S-1492, the Dorsey bill, which bans uranium mining. What the people of the most densely populated state in the nation will have to bear from uranium mining cannot be estimated. Should Exxon and Sohio reap monitary benefits by the wanton exposure of the population of the tri-state area to the hazards of radiation, we have only to look at the effects of uranium mining on the Indian population in Mexico, Wyoming and Utah to see the effects. Thank you. (Applause)

SENATOR DODD: Thank you. Marlene Genaud.

M A R L E N E G E N A U D: I am here from Jefferson Township, and I am here in support of S-1492. I am impressed with the testimony that has been given prior to this. I have only to add that I am what is called the Jefferson Jug Lugger, which I think people in this area may be familiar with. But, that refers to people in Jefferson in a community that is going into its third year of boiling its water. We live a quarter of a mile north of another community that is going into its twelfth year of boiling its water. There were both New Jersey and federal regulations preventing this from occurring. They were not enforced. And, my question to you is, how can we expect any regulations that may be put into effect concerning uranium mining to be regulated any better than the potable water regulations.

SENATOR DODD: How was your water contaminated?

MS. GENAUD: Our specific water supply came from a lake that was contaminated by a septic system. Most of the contamination problems were of fecal colinform. But, of course, the potential for contamination of anything anyone wanted to put into their septic system was present. But, Rockaway Township and Rockaway Borough are south of us just a few miles and their contamination is entirely chemical.

SENATOR DODD: We have a similar situation in Jackson Township in South Jersey.

MS. GENAUD: Yes, and again, there were regulations preventing all of those things from happening, just as this bill would be preventing or regulating uranium mining would have.

SENATOR DODD: The Star Ledger on Sunday and Monday had articles about the PUC regulating one aspect of toxic dumping, as to what what allowed or not allowed to be dumped, and they were setting rates for things that were not allowed to be dumped, and the other agency in Environmental Protection didn't know it. And, it is a classic example of the one hand not knowing what the other hand is doing in government. Unfortunately, it does not give confidence to you or anyone else in the same situation.

MS. GENAUD: No, that is why there is no question in my mind that S-1492 is the one that must be put into effect. Thank you. (Applause)

SENATOR DODD: Thank you. Steve Levinson.

S T E V E L E V I N S O N: My name is Steve Levinson. I was asked to speak for Mark Guarino on behalf of the Morris County Public Health Association. Basically, we have prepared a statement, but it will be somewhat modified in light of all the information that was offered today.

Basically our concern was that Assembly Bill A-2020,with the shortcomings after extensive review that we had noted in it, had passed the Assembly with virtually no opposition. Our concern was that I believe after speaking with Assemblyman Jackman that A-2020 was destined to be sent to your Committee for review and then on to the Senate. What our concern was basically was that in the present form of A-2020 there are some dramatic dangers which have not been addressed. I would like to read the statement that basically addresses those concerns.

State policy regarding uranium mining in New Jersey is presently being determined by legislation which in its present form could promote uranium mining in our state. In a news release dated August 19, 1980, the Morris County Public Health Association took a firm stand against the introduction of uranium mining and milling in New Jersey. The Morris County Public Health Association's position was based upon the alarming environmental and epidemiologic statistics relating to uranium mining which are further accentuated by great population and industrial concentrations characteristic to New Jersey. Extensive industrialization and its resultant pollution is considered a significant factor contributing to our unusually high cancer rate.

During September of this year, Assembly Bill A-2020 was introduced to the State Assembly by Assemblyman James Barry and Christopher Jackman. A-2020 was subsequently publicized and described as strict regulation of this inherently dangerous industry. After reviewing A-2020, the Morris County Public Health Association felt obliged to inform the public of certain shortcomings in this important legislation. A-2020 requires the Department of Environmental Protection to study uranium mining impacts in New Jersey during an eighteen month moratorium, and then to adopt rules and regulations which establish health and safety standards for the exploration, mining, and milling of uranium. Several fundamental weaknesses in A-2020 are evident.

There are no realistic provisions in this bill to adequately fund a project to study the impact of uranium exploration, mining and milling on health and environmental quality. A-2020 charges the Department of Environmental Protection

with the development of standards and regulations to promote "safe regulations" and thereby assumes that uranium mining can be safely regulated in New Jersey although current health and environmental statistics indicate otherwise.

A-2020 stipulates an eighteen month moratorium to enable an appropriate studyt o be performed. This time restriction could not possibly permit a comprehensive statewide, environmental impact statement given the limited $50,000 appropriation indicated in A-2020. Since the Department of Environmental Protection would regulate the conduct of uranium mining activities within the State, local governing bodies would lose their home rule authority to ban this historically hazardous industry within their own jurisdiction.

These are some of our concerns, but I think the important thing here is to focus on the fact that A-2020 has passed the Assembly, and that there has been very little movement at least prior to this meeting, and hopefully that will change. There has been very little movement with Senate Bill 1492. We hope that this misrepresentation in the local media regarding the strict regulations in A-2020 are realized in terms of A-2020 in its present form, which really affords virtually no protection against uranium mining in New Jersey and the Public Health Association of Morris County wanted to clarify this misrepresentation to the general public. Thank you. (Applause)

SENATOR DODD: Thank you. Mr. Witt.

E U G E N E W I T T: Thank you. I appreciate the opportunity to present some information. Last year in Jefferson Township, as you are all aware, we had quite a series of meetings on the uranium issue. At that time, I was the Chairman of the Jefferson Township Environmental Commission, and I prepared these charts based upon population density, which I think you may find sort of interesting, especially if you have never been out to New Mexico. Now, this is a chart here of New Mexico and part of Arizona. The blue boxes are counties, and the number in each county is the population. The spot up here is the Grant's mineral area, where most of the uranium in New Mexico was mined and processed. I drew three circles around there. Those three circles represent 25, 50 and 75 miles from the site of the activity. Within the 50-mile circle, approximately, based upon the area in these counties, 150,000 people live. As I say, if you have been out to New Mexico, you know much of the area is very, very sparsely populated.

Now, when we talk about similar activity in the State of New Jersey, let's see where we stand in a relative population situation. Now, first of all, I would like to make a comparison here, because things are quite small in these parts of the country and sometimes we don't realize that. This little map here - these three rings also represent 25, 50, and 75 miles. This is the whole State of New Jersey here, the little green spot. About the size of one of these larger counties here in New Mexico. So, we are dealing now with a very much smaller piece of geographical territory. This is an enlargement here of the area in which we live, and I drew the circles around Jefferson Township approximately here in Morris County. Again, the counties are outlined in blue with the population. But, there is one striking difference, not only the fact that there are more counties, but the population is so much greater. If we draw a 50-mile circle around Morris County, we include something like 16 million people, roughly 100

times more people live within a given radius of this area than they do in New Mexico. Unfortunately, some people even believe that this part of northern Morris County where I live is sort of a rural sparsely populated area, but it is not a sparsely populated area. It is a very densely populated area. Any environmental problems that are generated are going to affect many, many more people in this part of the country than they do in New Mexico. And, New Mexico does have problems as you have heard from the many people who have testified.

So, that basically is what I wanted to present to you, some of that idea on the differences of geography on the two areas. One more point I would like to make. As the Chairman of the Environmental Commission for many years, we in Jefferson Township have had terrible problems with drinking water, and I think Marlene Genaud has pointed this out. The State has regulations which supposedly are to govern the withdrawal of water of surface sources. In other words, they require a diversion permit. The water company from which we obtain our water has been obtaining water without a State permit for over fifteen years. Even though the State has been aware of this, time and time again the State has not been able to enforce its own regulations. Now, the regulation of water is a simple and straight thing. It doesn't involve the esoteric professional disciplines that Dr. Montague mentioned to you this morning. The regulation of uranium mining, if it ever comes to that, is going to be more difficult than the regulation of water, and even with water, we do have problems in this State.

So, I contend that any thought of regulating uranium mining at this time would be disasterous. Thank you. (Applause)

SENATOR DODD: Thank you very much for the graphics. That has put things into perspective. Our legislative reapportionment commission is accutely aware of the shifts in population.

Isabelle Sayen, Mercer Safe Energy Alternatives.

I S A B E L L E S A Y E N: I want to thank you for the opportunity to speak today and for holding this really remarkable hearing. I have never heard so many people so articulately express the dangers of an issue the way this has been handled today. The only thing that is very strange is that the industry people have not shown up to plead their cause. Are you having another hearing for the other side?

SENATOR DODD: Isabelle, I think your point speaks for itself.

MS. SAYEN: We must have scared them away. They knew they couldn't stand up under what is being offered here today.

SENATOR DODD: It has been the policy of our Committee to bring our group to wherever the problem is. We started that with the Pinelands bill two years ago, and with the opposition, we brought the Committee and all our people down smack in the middle of the pinelands, and we wanted to hear the worst. We did contact the industry and invited them. We told them that the hearing was going to be today. We solicited their testimony. As you well point out, their absence, I think, speaks for itself.

MS. SAYEN: Well, our group, the Mercer SEA Alliance who I am speaking for today is a group that tries to educate the public about the dangers of nuclear technology and to inform the public about the availability of clean, safe, sustainable and economical energy alternatives, and to oppose policies which place in jeopardy the health and safety of the entire human race. So, I am not going to make a

very long statement here. I have not gotten anything written out formally anyway. It seems to me that it is hubris, fallibility, ignorance, and greed that have characterized commercial development of nuclear power. Fallibility to me is the key word and the key understanding in this whole thing, and daily we discuss how fallible we are, that our knowledge is limited and what we knew yesterday was wrong, and our assumptions have to constantly keep up.

At Three Mile Island, it was not the laws of nature that failed. It was the human beings. It was the experts in the industry and in the regulatory agency that failed to protect the public's health and safety. That accident is far from over, and there will be others. The economics of that disaster are absolutely unbelieveable. The ripple effects to every utility company in this country is beyond anything that is put in the newspapers now as to the cost of that accident. They have come to a dead-end on cleaning the tridium out of the water that has collected in the bottom. They really don't know how to proceed. The years are constantly growing in how long it is going to take to clean that up, and the money also. It is a case of mismanagement and ignorance, and as I say, hubris. And, the hubris is that you can possibly inject a technology of this magnitude with these inherent dangers on to the public without having completed that technology. It is an inherently dangerous insoluable technology. Mindful of your job to try to weigh both sides of the picture and to protect the health and safety of the public, I just want to read a statement from George Wald. It is a quote from him. He is a biologist emeritus from Harvard University and nobel laureate. "The earth is our home first, and the place of business of various corporations only secondarily and by our sufferance. We are not just the human resources of big business. Our personal and communal safety is of the highest priority, not just a marginal factor in somebody's profit picture."

So, I would like to say that the Mercer Safe Energy Alternatives Alliance fully supports the ban. I do not agree with Dr. Montague. I know him well, but I do not agree with him that it should be a ten-year moratorium. I don't see there is any way to ever make it safe over the millenia that is going to be damaging to the environment and the people on this planet if there are any left.

If a study is needed to satisfy the industry, then I say have another bill to cover that, but I don't think we should have a moratorium. I think we want it gone once and for all. I hope that the testimony today has given that overwhelming picture to you. I see all kinds of problems with A-2020. It seemed to me it came up too fast. Nobody knew what was going on. If a bill like that ever came up, it seems to me that it is assuming that it can make it safe when all the doctors here have said there is no such thing as a safe level of radiation exposure. It is completely lacking in a licensing process. There is no call for public hearings after the regulations have been set by the DEP so that if an oil company makes a real estate deal and complies with the DEP, the public might not know about it. I feel that the public has to be involved. This is a public issue. The public now knows - and a great many of them should be educated as soon as possible - and they should have a chance to stand up and say, and it seems to me that the locality should have a jurisdiction over whether it wants that operation within their borders. So, on that note I will say thank you very much for the opportunity to register our feelings today. (Applause)

SENATOR DODD: Constance Stroh, Upper Rockaway River Watershed Association.

C O N S T A N C E S T R O H: My name is Constance Stroh, President of the Upper Rockaway River Watershed Association. I am a member of the New Jersey Clean Water Council and the Morris County Toxic Substances Task Force, and Chair the Upper Rockaway Sub-basin Coordination Group of the Passaic River Basin Flood Management Program. I live in Randolph Township.

The trustees of the Upper Rockaway River Watershed Association, an organization whose primary purpose is to protect and improve the quality of water in the Rockaway River and its Watershed have strong objections to uranium exploration and mining operations in Morris County. Our objections have already been stated very thoroughly by many speakers already today, so I won't repeat that. But, we consider these hazards and their impact on ground water and on the surface water sources of the potable water for Newark and Jersey City a strong reason for banning the exploration and mining of uranium. Because of our concern for potable water in the Upper Rockaway Basin, we have filed a petition with the United States Environmental Protection Agency to designate the area as a sole source acquifer. If so designated, all projects seeking federal funds would be subject to review by the Federal government to insure that the acquifer would be protected from contamination as a result of haphazard planning. Sole source designation also serves to emphasize the value of the acquifer to other governmental jurisdictions, such as local,county and state agencies. We believe that an attempt to control uranium activities by regulation or zoning ordinance is fraught with legal and environmental unknowns. The trustees of the association therefore recommend that the Legislature and the Governor act to prohibit statewide the exploration, mining and milling of uranium. (Applause)

SENATOR DODD: Kate Donnelly.

K A T E D O N N E L L Y: I represent the Safe Energy Alternatives Alliance. It is a statewide organization that has chapters in almost every county. Last summer when we found out there was going to be the prospect of uranium mining in New Jersey we became very concerned, because we are familiar with the problems that have happened in the southwest and in Australia and many other places as a result of the uranium mining. So, we began to learn about it and study and inform other people through different forums and events throughout the State. In the process of this time, we began a petition campaign and that petition campaign has gotten signatures from people in every county of New Jersey, primarily from northwestern New Jersey, and I want to present to the Committee these 13,000 petitions of people all over the State - and this represents not only these 13,000 people but many, many other people, many families have signed, and many people have not signed our petition yet because they have not seen it, and we are going to have more for you later. (Applause)

SENATOR DODD: Kate, your message is well taken, thank you.

Evelyn Witt.

E V E L Y N W I T T: I am Evelyn Witt from Jefferson Township and I am a Jefferson Jug Lugger. Perhaps because of this, and particularly because of this, I am going to express my support for the bill 1492 which would ban uranium mining, and my concerns on that bill 2020 that would permit it with regulations and a moratorium involving the DEP. I believe you have heard already that we have found that we cannot rely upon the DEP for a simple things such as water. Therefore, we feel it is very unlikely that the DEP could handle a complex issue such as uranium.

In addition to this, I believe that it is unsuitable to say that we will have any regulations or that corporations will assure us in any way, shape or form, even by putting tremendous amounts of money in escrow that they will be able to maintain a safe control of the milling and mining or processing of any sort. We have only to look at West Valley New York where the Getty Oil Company simply disbanded the company which was supposed to be caring for nuclear rods, radioactive rods. There is no way that you can legislate that a company must stay in business for 750,000 years, which is the half life of these chemicals and these particles that you would be unleaching on us. Until you can come up with such a system, I heartily recommend that you ban uranium mining and that you go to New York and Pennsylvania and anybody else who has anything similar and ask them to do the same. Thank you. (Applause)

SENATOR DODD: Dr. Frederick Schwartz, St. Clair's Hospital in Denville, Department of Environmental Protection.

D R. F R E D E R I C K S C H W A R T Z: Good afternoon, my name is Dr. Frederick Schwartz. I am an ex-member of the Executive Committee on St. Clair's Hospital in Denville in Morris County, and I am the ex-president of the Dell Society in St. Clair's and I was before the American Medical Association meeting in Morris County when we interviewed the engineers from Sohio and from Exxon and the medical doctors at first were more sympathetic with uranium mining and some of them wished that they had stock in uranium mines and some of them wished they would find some in their backyard.

Upon hearing some of the testimony from the engineers and upon turning down the fact that it was safe to wear watches on your hands as the engineers from Exxon would have us believe, and that the plaster board and the walls had radiation and that plates with red dye had radiation, the medical doctors from Morris County decided to turn down all the mumbo jumbo about the safety of nuclear energy and they decided to vote for a paper, a printed paper that I am sure you are all familiar with about the banning of nuclear energy from Morris County and hopefully from New Jersey and we would like it banned not for now but forever. Thank you. (Applause)

SENATOR DODD: Are any of the mayors here from Mount Arlington, and Roxbury or Hopatcong? They were in attendance earlier today.

Councilman Paul Nagle, Ringwood, represented by Nadine Shaw.

N A D I N E S H A W: I will summarize a letter, so as to save time, possibly. Councilman Nagle asks that you pass a ban on the statewide level and not at all consider any bill that asks for regulation. I also have my own testimony here which asks the exact same thing. I just want to say that I pray to God that you make the right decision. Thank you.

SENATOR DODD: Theodore Goodman, the town of Morristown.

T H E O D O R E G O O D M A N: Senator Dodd, fellow citizens, my name is Theodore Goodman. I live in Morristown. I am a licensed professional planner. I am currently serving as the President of the New Jersey Municipal Planners Association. You have heard authoritative descriptions today of the dangers which uranium mining and processing might hold for us in New Jersey. I would like to take just a couple of minutes to talk about how that would affect a particular community, and that community is where we are now, Morristown.

I am a Planner for Morristown employed full time for the town. I think a few facts about Morristown might clarify the impact, the potential impact

of uranium mining. We in Morristown where we are talking now are down wind and downstream from the probable sites of uranium mining if it were permitted. Most people do not realize that the density of the population in Morristown is 5,000 per square mile. That is equivalent to metropolitan inner city population - 5,000 per square mile.

The town and the adjoining township of Morris and Borough of Morris Plains had a total population of between 50,000 and 55,000 which is a considerable amount of people. Our problems with the environment are serious and are particularly in the field of air and water. And, both of these environmental problems would be potentially impacted by uranium mining to a degree that we can't measure at all, and that is the problem. We don't know the extent of the negative effect.

Let me just say briefly that our water supply is from the large acquifer that runs under most of this part of the State. The dangers of contamination of the acquifer by uranium mining are apparent and I am sure are well known to you and your study of the water supply. The river that flows through Morristown is a tributary of the Passaic. It is the Whippany River here. We have a lot of problems with water quality and flooding. We have a DEP ban on sewer connections to the Whippany River. Our sewer plant is on the Whippany River and has not been able to keep pace with the growth of population in recent years. We are improving it, but it is not ready yet.

Our air quality is so seriously threatened today by carbon monoxide that we are among the two or three worst locations in New Jersey for concentrations of carbon monoxide, primarily caused by automobile traffic. The monitoring position established by the DEP is around the corner from here on Washington Street. The problem is one which is serious enough so that people feel ill from the carbon monoxide in this area. It cannot be readily corrected by changing the traffic patterns, since our streets and highway pattern goes back to before the time of the automobile, back to the revolution, actually. The main state highway and federal highway go around the Morristown green as you know. The new highways have gaps - Route 24 and Interstate 287 are not complete and do not help solve the traffic congestion, so our air quality problem is accute.

Now, if we take the existing serious problems with air quality and water quality and the density of population that we have here. You can see in microcasm immediately right here where we are talking the dangers that might come upon us if we permitted uranium mining or processing in New Jersey and that were close to us, close enough so that this community would be impacted by it. Therefore, because the risks are unacceptable it is my opinion that we have no recourse except to enact a ban on uranium mining and processing. It is my opinion that we should support the legislation now pending which has been sponsored, I am happy to say by a Senator from Morris County, and we support Senate 1492 and hope that it will be passed by the Legislature in short order. Thank you. (Applause)

SENATOR DODD: Ladies and gentlemen, we are running out of time. We have completed most of the speakers. There are a few that we are not able to get to. What I would ask is that you submit written testimony and it does not have to be anything fancy. It can be on a yellow pad handwritten. You may deliver that to our Committee staff, Mike Catania, and that will be entered into the record.

What we have done today, I think, was very clear, and I think it was pointed out by the lack of any counter arguments to what you have presented to this Committee today. Within the legislative process, we want a bill that will be passed and signed into law, and as someone said earlier in the day, our business is the art of compromise. What I would look to recommend to the rest of our Committee and indeed the rest of the legislature and to the governor himself for signature, there has to be something that will work, and that is acceptable to 120 people plus one, the Governor. That is the reality that we are looking for. We don't want a piece of fluff that will look good today and say, "Gee we did a great job," and go home and not become law. That is self-defeating.

I have been through many of these hearings. What I will recommend will be a sunset provision on a ban. The sunset is a thing that we have been doing in the Legislature recently that would be a ban on uranium mining for five years, seven years, ten year, whatever would be negotiated. Some of the language from the Jackman bill that we addressed earlier on the hot spots that will not lock our hands in where we cannot go in and take care of those things using the .01 percentage as opposed to the "economically feasible." That may indeed strengthen the bill.

The sunset provision itself may strengthen the bill legally so it could withstand a legal challenge. These things we will research and this will be my personal recommendation to the Committee. I think with those provisions we can indeed pass this bill for the ban. DEP has been remiss in many areas, and it would be easy to blame just one agency. A lot of that has been our fault in the Legislature where we constantly heap upon them as the intent of the Assembly Bill, but yet we provide no additional dollars for them to implement the programs that we mandate. So, it is not entirely their fault. They have not been able to regulate the toxic waste industry to any degree of satisfaction. I think we have seen that very clearly. As we go into our next project, which will be the water issue in our state, a package of seven bills--- Again, none of those bills will solve our problem coming this summer. I would ask all of your collective help and you are obviously concerned citizens. You are active citizens, or else you would not have taken the time and effort to come here today and express your opinions. My toxic waste bill, S-1300 will be up for a vote in two weeks in the Senate, a major piece of legislation, the first of its kind in the nation. I believe I will need some help from those of you who will take an interest in this. It has been negotiated over six months. We have the virtual full support of every environmental organization within the State, the League of Municipalities and the Industry themselves reluctantly. So, this we are looking for and it will be landmark legislation. I do indeed ask your help.

Our most crucial issue going into the summer and into the spring is water. For those of you who were not here this morning, our Committee toured the northern reservoirs in our State. And, on an average we have now approximately 15% or maybe 18% of capacity right now in January. That is worse than at the height of the sixties water crisis and with no rainfall and snowfall this winter, we will be closing factories in June, and by July and August you can just imagine what it will be like. This we have never experienced before in the depth that we are looking for. I am not saying this as a scare or whatever. But, I was quite frightened myself yesterday.

Again, you have been a great audience, and I thank you for your participation today.

(Hearing Concluded)

104 Davey Laboratory
The Pennsylvania State Univ.
University Park
Pennsylvania
16802

28 January 1981

Mr. Michael Cattania
Office of Legislative Services
Room 128
State House
Trenton
New Jersey
08625

Dear Mr. Cattania:

Enclosed is my statement which I would like to have included with the record of the hearing on uranium mining held by the Senate Energy and Environment Committee, on January 20 in Morristown.

Please note that this statement is my own, and does not necessarily represent the opinion of The Pennsylvania State University. My affiliation is given here for identification purposes only.

Sincerely,

William A. Lochstet

William A. Lochstet

BIOGRAPHY

William A. Lochstet

Assistant Professor of Physics

Education

B.S. University of Rochester, 1957
M.A. University of Rochester, 1960
Ph.D. University of Pennsylvania, 1965

Experience

1957-1958, Graduate Research Assistant, Computer Center, University of Rochester
1959-1961, Graduate Teaching Assistant, University of Pennsylvania
1961-1965, Graduate Research Assistant, University of Pennsylvania Research with Tandem Accelerator
1965-1966, Instructor, Physics Department, The Pennsylvania State University
1966- Assistant Professor of Physics, Research with Van de Graaff Accelerator

Publications

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The Levels of ^{15}O Observed in the $^{13}C(^{3}He, n)^{15}O$ Reaction. H. F. Hinderliter and W. A. Lochstet. Nucl. Phys. A163 (1971) 661

Spectroscopy Of ^{15}O by use of the $^{13}C(^{3}He, n)^{15}O$ reaction. P. D. Georgopulos, W. A. Lochstet and E. Bleuler. Nucl. Phys. A183 (1972) 625

An Assessment of Uranium Mining and Milling in New Jersey

by

William A. Lochstet, Ph.D.

The Pennsylvania State University*

There is currently a proposal which could lead to the operation of a uranium mine in Morris County, New Jersey, near Lake Hopatcong. I wish to present an evaluation of the expected consequences to human health if such a project is carried out. At a uranium mine, ore containing uranium is removed from the earth. This uranium occurs in three isotopes all of which are radioactive. Of the uranium present, 99.3% is in the form of the isotope U-238. This U-238 decays with a half life of 4.5 billion years, thru many intermediate steps to an isotope of lead, lead-206. One of the intermediate steps is thorium-230 which decays with a half life of 80,000 years to radium-226. This radium decays with a half life of 1620 years to radon-222. Radon-222 decays with a half life of 3.8 days. Radon is a gas and can be carried by air movements. It is the health consequences of this radon which I wish to consider.

Unlike some other minerals, uranium does not occur in high concentrations in the ore bodies of the earth. In the western United States, uranium typically is present to 0.1% in the ore. This means that a ton (2000 lb.) of ore will contain only about 2 pounds of uranium. For this reason, the

* The evaluation presented here is my own, and not necessarily the opinion of The Pennsylvania State University. My affiliation is given here for identification purposes only.

uranium ore is taken to a "mill" where most of the uranium is extracted. To decrease the cost of hauling ore, the mill is located near the mine. Thus, economics dictate that a mill will be built and operated in Morris County also. The uranium concentrate is called yellowcake and is shipped from the mill in 55 gallon drums, typically. The ore from which the uranium has been removed is called tailings and is discharged from the mill as a slurry and accumulates to form a pile. This mill tailings pile will contain almost all of the radioactivity of the origional ore, but only 5 to 10% of the uranium. Thus, due to the radioactivity of the uranium and the decay process mentioned previously, the origional ore and the tailings contain specific quantities of thorium-230 and radium-226. It is the presence of these radioactive materials in the mill tailings that present a severe hazard.

In the mill the ore is crushed to a fine sand and treated with chemicals to disolve the uranium. The resulting tailings contain radium in a form which is more likely to disolve in water. Thus there are frequently problems with high concentrations of radium in groundwater. In addition, radon gas , created by the radioactive decay process, can move between the sand particles and escape into the air. This movement is slowed considerably if the tailings is wet with water. If a quantity of radon takes too long to reach the atmosphere, it may decay (radioactively) due to its 3.8 day half life. The origional ore body is now, today, one hundred (100) or more feet below the surface of the earth. That covering soil is very wet, and this prevents any significant amount of radon from escaping to the air. Thus, the ore body does not release radon into the air in its origional state, to any significant amount, and the health consequences are not significant.

The U.S. Nuclear Regulatory Commission has recently completed its environmental impact statement on uranium milling (Ref. 1). This document proposes that uranium mill tailings piles be covered sufficiently that a maximum of 2 picocuries escape from each square meter of the pile surface during each second, for radon-222. That is, the maximum emission rate shall be

2 picocuries of radon-222 / meter square/second(Ref. 1, P. 17). This value of radon emission will be used here. Although deeper burial would reduce the radon emissions, it would increase the problems with water contamination. Therefore it is reasonable to assume that the regulations will be met.

It is important to understand the relation between exposure to radiation and the health consequences (such as cancer or leukemia) which result from that exposure. There is considerable debate over the relationship between these quantities. In particular, there is much discussion as to wheather the effect per amount of exposure is the same for small and large exposures. The traditional approach taken in the public health area is to assume that every quantity of exposure has the same effect as every other quantity of exposure, that is that there is a linear relation between exposure and effect. This is the position taken by the Advisory Committee on the Biological Effects of Ionizing Radiations of the National Academy of Sciences (Ref. 2). This position will be used here.

The Nuclear Regulatory Commission (NRC) evaluation considers a uranium mill of typical size which creates a tailings pile of size 50 to 100 hectare (123 to 246 acres). To be conservative, the smaller size of 123 acres (50 hectare) will be used here; With the radon-222 emission rate noted above of 2 picocuries/ square meter/second, this emits a million picocuries each second. Over the course of a year this would add up to 31.5 curies of radon-222. This is the rate of release after the mining and milling has been completed, and the tailings have been covered over and abandoned. This rate of radon release will continue year after year, century after century, to be decreased by the 80,000 year half life of thorium-230 , and the 4.5 billion year half life of uranium-238. The model mill evaluation of the NRC (Ref. 1) prescribes an average mill efficiency of 93% for the extraction of uranium. In this case, 7% of the uranium is discarded with the mill tailings. With this information, it is possible by the laws of radioactive decay to calculate the total amount of radon-222 which will be released into the air. That amount is 14 billion curies.

The health condequences of the release of this 14 billion curies of radon-222 will be evaluated in the usual proposition of a linear relation between exposure and effect as mentioned previously. The NRC evaluation estimates a dose rate of 2 mrem/yr for each person 50 miles from a mill during a year when it emits 4430 curies of radon-222 (Ref. 1, Pages 6-28, 5-8, G-13). This is a ratio of 0.000,000,45 person-rem for each curie released. With 14 billion curies that would mean a dose of 6,500 person-rem if the population was fixed at one person out to the 50 mile limit. At present there are about ten million people in the down-wind direction, towards New York City. As a point of beginning, I will assume that this population does not change. This is a point of beginning from which alternative populations can be chosen and results obtained. Thus, with ten million people living in the downwind direction, within 50 miles of the tailings pile, the total dose would be 65 billion person-rem. Other populations would have proportionate doses. For instance a population of one million would recieve 6.5 billion person-rem. This dose is recieved by the bronchial epithelium tissue and leads to lung cancer.

The NRC estimate of cancer incidence is 72 premature deaths per million person-rem of exposure to the lung (Ref. 1, Page G-59). In this case the health consequences of the 65 billion person-rem estimated above is 4.6 million deaths, due to lung cancer. Even if the population in the area were to decrease to one tenth of its current value, the health consequences will be almost a half million (0.46 million) deaths.

It should be noted that this estimate expects about half of these deaths to occur in the first 4.5 billion years, assuming there are no changes. That is a death rate of less than one person per year. The problem is that the toxicity continues for a very long time. This legacy for our future generations should not be ignored. It is also here assumed that the buried tailings are not disturbed by erosion, digging, or deeper burial. Deeper burial would decrease the radon emissions and decrease the

number of resulting deaths, whereas erosion or digging would tend to uncover the tailings and increase the number of deaths.

The radiation doses presented here are muchless than the background radiation levels present in the area at this moment. This background radiation will also cause health consequences whinh are greater than those estimated above. This does not excuse an action which will kill more people. The question before us here is the effects of uranium mining and milling, not other events, whether natural or the result of human actions. Thus, any comparison with background radiation is an irrelevant statement meant to confuse the issue.

It has been shown that if a typical (model) uranium mill as described by the Nuclear Regulatory Commission in a recent study (Ref. 1), were to be placed in Morris County, New Jersey, the result could be expected to be 4,600,000 deaths due to lung cancer. It ishoped that the State of New Jersey considers these consequences in its evaluation of the desirability of having uranium mined and milled in its jurisdiction.

References

1 "Final Generic Environmental Impact Statement on Uranium Milling", NUREG-0706, United States Nuclear Regulatory Commission, September 1980.

2 "The Effects on Populations of Exposure to Low Levels of Ionizing Radiation", (BEIR report) The advisory Committee on the Biological Effects of Ionizing Radiations, National Academy of Sciences, National Research Council, Washington,D.C., November 1972.

141 Beechwood Avenue
Middlesex, New Jersey 08846

January 20, 1981

Senate Energy and Environmental Commission
Room 302
State House
Trenton, New Jersey 08625

Dear Sirs:

The following is offered as written testimony concerning your hearings on the subject of uranium mining in the State of New Jersey. I am a resident of the Borough of Middlesex, a member of the Middlesex Board of Health, a member of the Environmental Health Committee of the Delaware-Raritan Lung Association, and am employed as Professor of Biology at Rutgers, the State University. My educational background includes the B.A. degree from Harvard University, the M.D. degree (cum laude in biochemistry) from Harvard Medical School, and the Ph.D. degree (in Zoology, with additional training in biochemistry) from the University of Florida. I have written four books and numerous scientific papers on environmental subjects. I have been a member of the Middlesex Board of Health during all the recent efforts to control the radioactive hazards in that borough, and am thoroughly familiar with these activities.

I do not believe that it is possible under any circumstances to mine uranium anywhere in the State of New Jersey in a manner consistent with the health and safety of the citizens of New Jersey. My reasons are as follows:

1. Psychological Fear of Radiation: New Jersey is now surrounded by one of the densest concentrations of nuclear facilities in the world. There are already nuclear power plants at Oyster Creek, Salem, and Indian Point. More are being built at Limerick and Shoreham. A functional unit at Three Mile Island, directly upwind from us, is scheduled to go back on line shortly. A number of corporations in the region, such as Union Carbide and Squibb, either operate research nuclear reactors or have large inventories of dangerous biologically active radioisotopes. Many university and corporate laboratories now work with large quantities of lower level but still dangerous radioactive compounds, and if the proposed revised regulations are put into effect they will soon be able to empty their radioactive wastes into ordinary drains.

In addition, there is the well-known high incidence of cancer in our state. The connection between radiation exposure and cancer is proven beyond doubt, and the public is aware of it, as they are aware of the connection between radiation and birth defects. Mining is always a messy operation, even when the inevitable accidents are not occurring: dust blows from the site, ore (which may be distinctly colored) leaks from trucks or other conveyances, spoil piles are conspicuous. Hundreds of newspapers, TV stations, radio stations, activist groups, and more than 12 million people are within 75 miles of the uranium sites. This mining will have a

high profile and it will be constantly noticed and in the news. Protests and accidents will keep it in the news. Fear and anger, perhaps on an unprecedented scale in our state, will be the inevitable, and justified, response.

In the Borough of Middlesex the bulk of our radiation cleanup involved moving contaminated dirt from one small yard to a place a few blocks away. Yet in spite of coordinated, bipartisan activity by the Mayor and Council, vigilant monitoring by the Board of Health, ceaseless efforts by local health officials, and soothing words from the N.J. D.E.P. and the U.S. D.o.E., we had great difficulty calming public fears. Imagine what it would be like in a really big operation. New Jersey is not Colorado. North Jersey is more densely populated than Japan or China. There will be no hiding uranium mining here, corporate claims of locally low population density to the contrary.

2. The Failure of Safeguards: In the Middlesex radiation cleanup we were promised many safeguards. The principal contractor was experienced in radiation cleanup, the U.S. Department of Energy lent its expertise to the planning, and federal monitoring was supplemented by a team from the state Department of Environmental Protection. Yet it is fair to say that this trivial, simple operation was a mess from start to finish and left us little better off than when we started, a testimonial to the incompetence of the supervising federal and state agencies.

Planned safety procedures were ignored or didn't work. Contaminated dirt dribbled on to streets and lawns; contaminated dust drifted into windows. Monitoring equipment was in place too late and checked too infrequently to be of any immediate use or long-term value. The statistical methodology of the monitoring operations was farcical. Frightened local residents were intimidated with scientific doubletalk by state and especially federal representatives. Protective covers at the excavation and dump sites were often not in place. Strangers (and possibly children) walked in and out of gates that were supposed to be locked; fences could be easily climbed anyway. Contingency plans were inadequate or non-existent. Cleanup personnel supplied conflicting information and occasionally lied to town officials. Coordination with local public safety authorities was poor. Subcontractors were badly supervised. There was no clear chain of command or responsibility.

In the case of uranium mining in New Jersey there will be the added complications of corporate secrecy and huge scale. No real safeguards will be possible, regardless of what is promised in advance.

3. Surface and Ground Water Pollution: The hydrology of northern New Jersey is very complex and not entirely understood. Mining and ore processing operations are notorious for both consuming and polluting surface and ground waters. The Passaic River watershed and other nearby watersheds and regional aquifers provide water that is used by millions of people. It is already polluted; in fact water pollution (and supply) has reached crisis proportions in New Jersey. Proponents of uranium mining will claim, but cannot prove, that they will protect regional water supplies from radioactive contamination, and that they will not use excessive

quantities of water. The history of serious (and long-lasting) water pollution from uranium mining in the West refutes such claims. On July 16, 1979, in the nation's worst radioactive accident, the United Nuclear Corporation's uranium mining facility at Church Rock, New Mexico, spilled 100,000,000 gallons of radioactive water and 1100 tons of contaminated debris into the Rio Puerco River, rendering it unfit for human and animal use for 60 miles downstream. That is just one of many possible examples. Do we really need to ask the public to accept the very real risk that the claims of safety for our water supply will turn out to be wrong?

4. Health Care of Miners: Uranium miners are a high health risk group. Insurance underwriters can easily confirm this statement. The burden of care for uranium miners with acute, chronic, and terminal illnesses will fall on local and regional health facilities. Are they prepared to cope with this burden, including the inevitable costs that will accrue regardless of compensation and insurance?

5. Support of Regional Nuclear Expansion: Permission to mine uranium in New Jersey, even on a small scale, will provide the nuclear industry with a foot in the door. Soon they will want to expand mining operations. Then they will want to add ore processing facilities to minimize freight charges. Then satellite industries using the processed ore will proliferate. This is all highly undesirable and dangerous, and will change the character of the state.

6. Environmental Degradation: Tiny New Jersey has been blessed with magnificent natural environments for the enjoyment of its enormous population. The state has been wise and generous in its provision of public parks and recreation areas, and private landowners have preserved many other tracts, but we do not have any such land to spare. We cannot afford to have even small areas declared off limits because of uranium mining, let alone the larger areas that could be lost in case of accidents. Nor should we believe claims of restoration and new "parks" made by the mining companies. Restoration or reclamation technology is mediocre at best, especially in hilly terrain; and in the case of parks, the public's rejection of New York State's Nuclear Lake should not be forgotten.

IN SUMMARY, based on my knowledge of health and environmental problems in the State of New Jersey, it is my opinion that uranium mining anywhere in the state would inevitably lead to unacceptable health damage (psychological and possibly physical) to the citizens of the state, would damage some of our finest scenic and recreational lands, would probably contaminate and possibly deplete surface and ground waters, would add the burden of acute, chronic, and terminal health care of uranium miners to the existing problems of local health care facilities, and would probably lead to the dangerous expansion of nuclear industry in the state. Furthermore, from the history of uranium mining, of the nuclear industry in general, and of nuclear regulation, it is clear that safeguards do not work. New Jersey has already accepted the nation's greatest proportional share of the risks and damage associated with the chemical industry. Our environment and people are already strained to the

breaking point. We cannot afford any more of these terrible sacrifices.

Sincerely yours,

David W. Ehrenfeld

David W. Ehrenfeld

the Mountain School and Montessori Preschool

962-4742

P.O.Box 11
Ringwood, New Jersey
January 19, 1980

Senator Frank Dodd
Senate Energy and Environment Committee
The State House
Trenton, New Jersey 08625

Dear Senator Dodd:

Our staff members at Mountain School/Montessori Preschool will be teaching tomorrow in Ringwood and will be unable to attend your public hearing on uranium exploration, mining, and milling in New Jersey. As citizens of this state who are deeply involved in the lives of young children, we are therefore putting our position down on paper to you, and we sincerely hope that you will consider our written testimony just as seriously as the words of those who were able to drive to Morristown to present their opinions.

We unanimously agree that the only way to protect the health of these children we are currently teaching, as well as the health of future generations of children, is to have a total ban on all uranium-related activities within this state. We will not accept the concept of a regulated uranium industry, nor would we believe that our interests would be protected by a moratorium while further

the Mountain School
and
Montessori Preschool

962-4742

study is done. In other states, the mining companies have not followed the guidelines set forth by government agencies, and there is no good reason to expect them to change their behavior in the future in our state.

For the sake of all school children in New Jersey, please support a total ban.

Thank you for considering our position.

Sincerely,

Mary Veitch

Pat Delo

Pat Fraser

Mary Loudin Gittleson

Miriam Green

Robert Campbell

Steven Peabody

Roy Jakubowski

mlg

January 26, 1981

Senator Frank Dodd
Senate Energy & Environmental
Committee
State House
Trenton, N.J. 08625

Re: S-1482 - Uranium Mining in the Township of West Milford

Dear Senator Dodd:

This is to inform you that my husband and I are residents of the Township of West Milford and are completely opposed to the mining or uranium in our community.

We hope something can be done in the near future to put a stop to this.

Sincerely,

Carol & Lea Den Heyer

Mr. & Mrs. Leonard Den Heyer
58 Chatham Road
Hewitt, N.J. 07421

Shelter Our Sisters, Inc.

109 First Street • Hackensack, New Jersey 07601
Business Phone 9 - 5 (201) 487-7800
Hot Line (201) 944-9600 24 Hours

"Never Another Battered Woman"

Sandra Ramos
Executive Director

Michael Catania
Office of Legislative Services
Room 128
State House
Trenton, N.J. 08625

Jan. 19, 1981

Dear Mr. Catania:

For the past 39 years in general, and the last 11 more specifically, I have been devoting my life to the service and survival of humankind. As the director of Bergen County's only Battered Woman's Shelter program, I have been desperately trying to eliminate violence and destruction in the family. This must take place so that we can stop the cycle of violence that is perpetuated from one generation to the next.

If uranium mining is allowed to take place, we will have a whole new generation of CRIPPLED, DEFORMED MUTES. Is this what we want for our children's children? If not, we must look clearly at the unredeemable genocide we are perpetuating on ourselves and our inheritors of the world. I join all those who have seen the light and will fight to stop this genocide in its early stages, i.e. uranium mining, milling and exploration, before it stops us.

For the survival of our people and our planet, I remain

Yours truly,

Sandra Ramos E.J.

Sandra Ramos
Executive Director

Summer home:
150 Snake Den Rd.
Ringwood, N.J.

S.O.S. is a Tax-Exempt, Non-Profit Corporation, funded through the Bergen County Board of Chosen Freeholders, Title XX, Community Development, and Private Sources.

TOWN HALL
1480 UNION VALLEY ROAD
WEST MILFORD, NEW JERSEY 07480
TELEPHONE: (AREA CODE 201) 728-7000

January 21, 1981

Mr. Catania
Senate Energy Committee
302 State House
Trenton, N.J. 08628

Dear Mr. Catania:

Enclosed is a copy of my comments recommending the adoption of Senate Bill S-1492.

Due to the lengthy testimony on January 20th in the Morris County Freeholders Conference Room, I was not able to present this in person.

Yours truly,

Kenneth R. Hawkswell

Kenneth R. Hawkswell
Director of Health

KRH/mw
enclosure

TOWN HALL
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TELEPHONE: (AREA CODE 201) 728-7000

Testimony Prepared for
The Senate Energy Committee Hearing
on January 20, 1981

Ladies and Gentlemen and Legislators. My name is Kenneth Hawkswell, and I am representing the West Milford Township Council.

West Milford Township enacted an ordinance prohibiting the test boring, mining and milling of uranium on October 1, 1980. Within two months of that date, suit was initiated by a large property owner, challanging our ordinance. The enactment of S-1492 into law would assist us and other municipalities in challenges to our ordinances.

The uranium mining and milling problem goes beyond municipal borders:

1. West Milford Township is the collection watershed for the potable water supply for more than 10% of the population of the State of New Jersey. Mine water discharge is a serious threat to these supplies.
2. Our aquifiers supply numerous individual and public wells.
3. Windblown radiation ladden dust can be carried across municipal borders.
4. Radon released from ore exposed to our atmosphere will travel distances.

Our dense population does not lend itself to uranium mining and milling activities. The proximinity of New Jersey residents to the proposed uranium mining and milling operational areas would create adverse public health conditions.

West Milford believe[s] that such activity is potentially dangerous to the health, safety and welfare of the residents of the Township of West Milford

and other citizens of the State served by the watersheds lying within West Milford Township.

The governing body of West Milford Township recommends the adoption of S-1492.

ANGRY CONSUMERS AND TAXPAYERS, INC.

ACT!

Jan 21 1981

N.J. Senate Energy & Environmental Committee
Trenton, N.J.

I have attended the Morristown hearing of your committee and was not afforded time to give testimony. The testimony presented was so overwhelming and uncontestable (and uncontested by the mining interests) that there is absolutely no question that a a firm total State ban must be put into law.

What is extremely ominous about uranium mining in New Jersey is that hauling and dumping by teamster organizations is so corruptable, and their operations so apt to skirt regulations, that it would open another hazardous garbage can to be covertly trashed around in hidden locations without heed to environmental control-- certainly beyond inspection capabilities — so as to draw a shroud around safety. The lobbies representing the haul-interests should of course be forced out in the open before the Senate takes up the bill, so that their position and last minute maneuvering can be reported on, so concerned citizen groups can send out further warning. In this way the public serves rational environmentalists in the legislative bodies to serve the interest of landowners and businesses in the targeted areas. Anyway, we all want to clean up New Jersey -- I hope.

Therefore it is urged that S1492 be brought out of committee in tip-top shape for passage.

I regret that there was not more time for further testimony the following day, and particularly in the evening of the 20th, so that working people could get their licks in. Perhaps it will prove to have not been necessary.

yours,

E. Tuyere

Edison Tuyere

8 HIGH STREET, MORRISTOWN, NJ (201) 455-9760

POST OFFICE BOX M, WHARTON, NEW JERSEY 07885

20X

Statement on behalf of the Peace
and Community Action Center,
P.O. Box 143
Maplewood, N. J. 07040

The Peace and Community Action Center of Maplewood-South Orange wishes to express its communal dismay over the latest and perhaps greatest threat yet to our health and well-being which is represented by the uranium exploration, which is already taking place in New Jersey, and by the mining and milling of uranium projected for the future. We are bone tired of reading every day of some new and as yet unsuspected threat to our environment. We have learned that New Jersey is already one of the most dangerous places in the United States in which to live since it has the nation's highest incidence of cancer. Most of us do not have the option of escape to some possibly safer location, and, in any event, that is no answer. The answer is for our legislators to represent the will of its citizens by voting a total ban on uranium mining and processing as expressed in Senate Bill S1492 and not for a moratorium only.

NEW JERSEY SENATE

FRANCIS X. HERBERT
SENATOR, 39TH DISTRICT
167 FRANKLIN TURNPIKE
WALDWICK, NEW JERSEY 07463
201-652-5605

Statement by Senator Francis X. Herbert before the New Jersey Senate Energy and Environment Committee at a public hearing held on January 20, 1981 in Morristown, New Jersey.

I wish to express my appreciation to Senator Dodd and the members of this committee for allowing me to make this statement through my aide, Joanne Atlas.

As one of the co-sponsors of Senator Dorsey's bill, I heartily endorse the purposes and effects of S-1492. I fear that anything other than an outright prohibition of the mining of fissionable material presents us with insoluble problems, now and in the future.

Let me offer some of the concerns which have troubled me during the past few months:

First of all, I am deeply disturbed by the immediate impact of uranium mining upon the quality of life in northern New Jersey. The proposed mining area is in one of the most beautiful and open areas left in this state. To envision the hordes of trucks and equipment, miners and their families, stores and services which would inundate this area is to relive the history of many of our cities, once made prosperous by industry, now living in the dust and decay of a declining economy. The sociological effects of any new industry are always profound and protracted, but the effects of a short-lived uranium mining industry will be deep and lasting.

Second, I am concerned about the long term aesthetic effects upon our region and our state. Visitors who travel the New Jersey Turnpike already have a prejudiced and distorted view of New Jersey. Why add huge mountains of mill tailings, seething with hidden radioactive dangers? Why add empty mines and a devastated countryside to the already blemished image of this state?

Last, I ask you gentlemen to consider the unmentionable - the long term consequences which we will suffer when we uncap the atomic bottle. We are already seeing the results of the use of Agent Orange in Viet-Nam. How can we possibly measure the genetic and physical effects of uranium mining upon our children and grandchildren? Much of our precious water supply is in the proposed mining area. What if we find that we cannot drink that water? Where can we possibly go to replenish our water supplies?

Gentlemen, speakers far more informed and qualified than I will be heard today. I ask that you carefully consider all the testimony and vote for caution and in the interests of safety - vote to report this bill favorably.

NORTH JERSEY DISTRICT WATER SUPPLY COMMISSION

AMENDED AT MEETING OF 12/10/80

RESOLUTION

WHEREAS, there are watersheds in northern New Jersey which are the sources of drinking water and these same areas are possible sources of fissionable source material (uranium or thorium); and

WHEREAS, the mining of this fissionable source material with the waste tailings involved present a potential threat of radioactive contamination to these water sources; and

WHEREAS, the degradation of these irreplaceable water sources would have a profound effect on the economic well-being of metropolitan New Jersey in much greater ratio to any benefits which may be derived from opening any of these mines;

THEREFORE, BE IT RESOLVED that no subsurface exploration for fissionable source material, or mining of fissionable source material, be permitted on any watershed serving as the source of a potable water supply, and

BE IT FURTHER RESOLVED that this Commission support Senate Bill No. 1492 and this resolution be communicated to all Senators and Assemblymen in the State of New Jersey.

Lorraine Gold and
WILLIAM J. GOLD
ATTORNEY AT LAW
RD 3 BOX 107
BLAIRSTOWN, N. J. 07825

TELEPHONE 362-9321

January 20, 1981

New Jersey Senate
Committee on Energy and the Environment

Dear Legislators:

We are unalterably opposed to the mining and/or exploration of uranium in any form in New Jersey. We offer this letter in the form of written testimony in today's hearing.

It is becoming more and more obvious that the human species does not have much time left unless we wake up to our responsibility to live in harmony with the natural systems that support life. Every day in the paper, on the radio, TV, and magazines we read of another neighbor with a polluted well, rain so acid it can burn our crops, soil erosion, poor air quality. The New York Times on Jan. 11th, 1981 had a U.S. map with states white for clean, striped for endangered and black for polluted. New Jersey was black; the Garden State is colored black.

Well, we've been taught that there is a basic instinct called preservation of the species, and that is why we are attending this hearing.

We want to stand up and say loud and clear that it does not make sense to mine uranium in New Jersey. They want to dig up our earth, mine tons and tons of radioactive material, extract a tiny percenatage and leave mountains of seething garbage. Just what N.J. needs, more mountains of seething garbage!

Now they may want us to believe there is economic opportunity in this for us. But the ones who will profit are the Oil Companies. We're not willing to further endanger our life sustaining environment to cooperate with the short-sighted ideas of Exxon, Sohio and company.

Mining uranium is opening Pandora's Box. As soon as the process begins, radioactivity begins to seep into our world. We are beginning to be aware of how lethal this is - as a cancer causing agent and as a genetic altering agent. This nuclear experiment means more suffering, more pain, more worry; about our retarded children, our weakened immunilogical systems, our poisoned earth, and our ever increasing power to annhililate ourselves with nuclear weapons.

We are told that the nuclear power uranium will provide will save us from the energy crisis, but any careful study of the whole system shows this to be a false dream with fatal flaws. It is more expensive in dollars and in human costs than we can tolerate if the human family is to survive. It seems to us that we are at

a crossroads. Some call our choices the hard path and the soft path. Let's turn our human ingenuity towards solar, wind and other renewable resources and renew our commitment to life.

Very truly yours,

Lorraine Gold

William J. Gold, Esq.

Borough of Ringwood

COUNCILMAN PAUL E. NAGEL

60 MARGARET KING AVENUE
RINGWOOD, NEW JERSEY 07456
(201) 962-7037

January 19, 1981

Senator Frank Dodd
Senate Energy and Environmental Committee
The State House
Trenton, New Jersey 08625

Dear Senator:

As a member of Ringwood's Council, I welcome the opportunity to express opposition to Uranium mining and milling. I oppose such activity in the Borough of Ringwood, where a local ordinance banning it was passed unanimously on December 17th, 1980. Furthermore, I oppose Uranium mining in North Jersey and ask that you support a State-wide ban.

Although it is unclear whether exploratory drilling has as yet occurred in Ringwood, our local ban is intended to preclude the possibility henceforth. Concern for residents' health and water purity prompted our action.

I ask you to support our efforts with a State-wide ban and exclude from consideration any bill calling for regulations. Please keep me advised of any action you take on this matter.

Sincerely,

Paul E Nagel

Paul E. Nagel
Councilman

PEN:kc
cc: Hon. Mayor & Council
Borough Administrator

We are against the mining, milling or any other form of releasing radiation into our environment. We do not favor a legislative solution to this potential problem. However, seeing little or no other recourse, we support S-1492. We will protest any measure, bill or statement which do not address first the health aspects of this issue.

David Epstein
65 North Franklin Tpk.
Ramsey, New Jersey 07446
(201) 327-6669

Rosemary Gismondi
New Milford, New Jersey 07646
(201) 261-0743

Robert P. Hennelly
(201) 327-6669

John Migliaccio
155 Myrtle Avenue
Fort Lee, New Jersey

22 Wanaque Terrace
Ringwood, New Jersey
January 20, 1981

Senator Frank J. Dodd
Senate Energy and Environment Committee
State House
Trenton, New Jersey 08625

Dear Sir:

I welcome the opportunity to speak to you about this matter. My name is Nadine Shaw and I am from Ringwood, one of the towns with a local ordinance banning uranium mining. When this ordinance was passed, it was done so unanimously. I am thinkful that Ringwood has taken such action to protect itself and its residents.

Uranium mining and milling is an entirely inappropriate activity for our area and for New Jersey. We are located in a watershed serving Newark, Paterson, Kearny, Passaic, Clifton, Montclair, Glen Ridge and Bloomfield. Besides being concerned for the water supply of these areas, I am also concerned for the quality and quantity of Ringwood's water supply. For many months out of the year, for the last several years, the town has been under water emergencies because of inadequate supplies. In light of the water difficulties, it is absurd to suggest a uranium mining or milling operation be located here. Just recently, the town was dismayed to find potential sources of water contaminated with benzene and like compounds because of past dumping of the Ford Motor Company. We must avoid any further contamination due to unwise and dangerous land use.

It is often said that there is nowhere left to run in this abused environment. However, if uranium mining comes to Ringwood or New Jersey, I, along with many others, will be forced to leave. However, the true tragedy will be those who are forced to stay. They will be the guinea pigs of a technology with a horrendous record of disregard for life. It is an unspeakable burden to have to live in fear of the air we breathe, the water we drink, and the genetic health of our descendants.

Unless you Senators vote for a ban on uranium mining, you will be placing these burdens on millions of people. I do not want any bill which calls for regulations, but only a bill which effectively bans uranium mining. It is your responsibility as our legislators to bring this about.

There is no safe level of radiation and uranium mining and milling yields the highest radiation dose of the nuclear fuel cycle. Women and children and old people are the most susceptible to the effects and each year we are all accumulating radiation in our bodies.

It is time for us to stop uranium mining in New Jersey before it starts. I pray to God to guide you.

Sincerely,
Nadine Shaw

I support the banning of uranium mining and milling activities in the State of New Jersey because I feel that the very foundations upon which past and present radiation exposure regulations are based are unsound.

Stellman and Baum have stated in their book, "Work is Hazardous to your Health" that the legal standards for exposure to radiation (adopted September 17, 1965) has set a limit of five rems per year for radiation exposure, but a worker who is exposed to this much radiation has a 50% greater chance of developing cancer than an unexposed person. This legal limit, in essence, guarantees a higher incidence of cancer for exposed workers. They also stated that independent researchers have not been able to determine a level of radiation that did not produce some biological damage.

In a report of The Panel on Practical Problems In Actinide Biology in a workshop held on research needs in actinide biology, April, 1977, by Battelle Seattle Research Center, it was stated that nearly 250 cases of lung cancer have occured among uranium miners of the Colorado Plateau, six times the incidence of lung cancer compared to unexposed individuals.

In this report, it is stated that risk estimates used in determining legal radiation exposure standards are based on poorly known imcomplete epidemiologic data, guessed at exposure history, and involves a large degree of uncertainty. Experimental verfication is needed of cause and effect relationships and more refined dose estimates in miners are urgently needed.

Other studies have also demonstrated that the standards for the allowable doseage of radiation are not adequate to protect both workers and community.

Radon gas and its radioactive daughter products pose one of the greatest hazards in the form of radiation released to the environment from the uranium mining and milling processes.

A statement from the U.S. Nuclear Regulatory Commission's draft of the general environmental impacts of uranium mining and milling (1979), as cited in the Uranium Mining and Milling Primer, coordinated by David Riccitiello for the Southwest Research and Information Center, said, "Ventilation shafts which remove radon gas from the uranium mines to reduce miners exposure raise the general level of alpha radiation in the vicinity of the mine. Individuals living within about 4 kilometers (2.5 miles) are also ar greater risk because present radiation standards could not be met. Also, populations thousands of miles away from the source may be subjected to radon gas."

In the standards set for operations associated with the milling of uranium ore, the maximum permissible organ or whole body dose equivalent for persons in the general public as the results of exposures to planned discharges of radioactive materials to the general environment from uranium fuel cycle activities and radiation from these operations is .025 rems/year.

These standards exclude dose equivalents attributable to radon and its daughter products. This standard also does not apply to off-site wind blown tailings and operations at waste disposal sites, according to the EPA Federal Registrar, 1977, cited in the Uranium Mining and Milling Primer.

In New Jersey, the most densely populated state in the nation, a tremendous number of people could be exposed with the health risks and hazards of exposure to radiation and radioactive materials.

How can we justifiably allow these risks to be placed on so many people when we are not even certain of the foundations upon which these regulations will be based?

Laurette Heiser
141 Ralph Avenue
Hillsdale, New Jersey 07642

I would like to urge this committee to support a total ban (S-1492) against uranium mining and milling within the State of New Jersey.

This would prevent an industry from developing within watershed areas that provide approximately 100 million gallons of water per day or 10% of the water used within this state to residents of Northern New Jersey. Jeopardizing this supply from processes inherent in uranium extraction would create serious problems for individuals nearby and for many others miles away.

We can see the need for water currently being hard pressed by the drought conditions that prevail and thus this presents a scenario for what may occur if contamination became evident as did radio-active contamination in a number of areas within the United States where uranium mining is occuring. A tremendous initial cost of maintaining potable water for the residents of the affected area would have to be carried by the State.

For example, the initial cost that the State of New Jersey had to bear for the laying of the pipeline from Lake Hopatcong is $.4 million. We were lucky that the federal government laid out an additional $1.1 million. These funds, particularly those funded by the State, will then be paid back to the State by the users in the form of higher water bills. I would also like to make it clear that this amount of funds was used to supply ¼ of the water needed by Northern New Jersey.

If future supplies are lost due to contamination, there would be a tremendous problem produced that would affect the economic burdens of all individuals in Northern New Jersey, not to mention the more drastic problems if a replacement supply was not found.

For these reasons, and many others presented here today, I hope that the State of New Jersey will not allow an industry with both hazardous physical and economic potential to become rooted within our state.

Thank you,
Kevin Kratina
113 Dewey St.
Garfield, New Jersey 07026

The fact that the possibility of exploring and mining of uranium in New Jersey has reached political levels is one manifestation of the emotionally charged issue. Concerned people in sections of our state have considered all aspects in relation to the process of extracting uranium from the earth. As a consequence, communities have passed local ordinances banning such activities in their towns.

Presently, there are two legislative bills under consideration. One bill would place restrictions on the exploration and mining of uranium based on population levels. The other bill would place a ban on these activities. It is my hope and desire to see bill S-1492 proposed by Senator Dorsey passed, banning such activities.

My thoughts are based on information I've listened to, read and watched. The sources were reputable and both pro and con on this issue. I've weighed the risks and benefits for New Jersey and based on its population and present problems, I see no alternative but to pass this bill. Currently, the State of New Jersey is undergoing a severe chemical backlash which threatens our natural environment, pollutes our water and air, and decreases our life expectancy. In a state where industry is pervasive, adding the additional burdens associated with uranium mining and milling would surely create consequences of an immeasurable and undesirable degree.

Possible effects would include pollution of our water, land and air. These factors would lead to greater health risks. There undoubtedly will arise socio-economic problems associated with an influx of this type of temporary industru, including a shift in the economic base of the communities. There will be housing, educational, food and water shortages. Regulatory weaknesses will occur, as methods of enforcement are lacking. Most importantly, the exploration, mining and milling of uranium will lead to a proliferation of nuclear energy. Nuclear energy has proven to be an overcentralized, costly, unclean, and dangerous mode of energy production.

We need to realize that sage energy can be produced successfully utilizing alternative sources of production. An emphasis on conservation, solar, wind, biomass, co-generation, and the other safe energy sources should become our focal point. A step towards this goal would be accomplished by the passage of this bill.

Respectfully submitted,
Craig Mangeau
28 Windermere Ave.
Mt. Arlington, New Jersey 07856

DATE DUE
