HAZARDOUS WASTE AND DRINKING WATER

JOINT HEARING

BEFORE THE

SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT

AND THE

SUBCOMMITTEE ON TRANSPORTATION AND COMMERCE

OF THE

COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE

HOUSE OF REPRESENTATIVES

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HAZARDOUS WASTE AND DRINKING WATER

FRIDAY, AUGUST 22, 1980

HOUSE OF REPRESENTATIVES, SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT, AND SUBCOMMITTEE ON TRANSPORTATION AND COMMERCE, COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE

Washington, D.C.

The joint subcommittees met, pursuant to notice, at 10:30 a.m., in room 2322, Rayburn House Office Building, Hon. Henry A. Waxman, chairman, Subcommittee on Health and Environment presiding.

Mr. WAXMAN. The meeting will come to order.

The Subcommittee on Health and the Environment today continues its hearings on the implementation of the Safe Drinking Water Act.[1] We turn our attention today to the grave national problem of contamination of our precious ground water resources by hazardous waste.

We are pleased to be joined today by the Subcommittee on Transportation and Commerce. Under the leadership of my good friend, Jim Florio, the subcommittee has played a leading role in trying to protect ground water resources from improper waste disposal practices.

We will hear testimony today not only from the Federal Government, but also from State and local officials and citizen's groups seeking to focus public attention on this important problem.

I would like to especially welcome as our first witness the Hon. Norman Lent, our colleague on the Interstate and Foreign Commerce Committee. I anticipate that he and other witnesses will help find legislative answers to this vital national concern.

Mr. Florio.

Mr. FLORIO. Thank you very much. I appreciate the joint hearings on this subject of mutual concern to both committees.

I do not have to go through the prepared statement to indicate the extent of the problem of ground water contamination. Our involvement, that is, the Subcommittee on Transportation and Commerce involvement, largely is in the areas of hazardous waste as a major contributing factor to the pollution of our ground water supplies.

The potential size of ground water contamination is rather significant, and in examining 100 ground water contamination incidents, the Congressional Research Services found that over 1,300 wells were closed. Two of these incidents alone affected the ground water of nearly half a million people in my own State, the State of

[1] Three days of hearings were held June 6, 9, and August 18, 1980 and may be found under title Quality of Drinking Water—1980, Serial No. 96-188.

New Jersey. State officials have already closed 450 individual domestic wells and 32 wells operated by municipalities and the water supply companies.

The impact of ground water contamination extends beyond the increased risk of health defects, cancer, birth defects, and other adverse health conditions. Businessmen in a wide variety of enterprises, especially those that demand clean water, sustain substantial losses as a result of this problem, real estate developers, individuals, farmers.

In my own area, the cranberry industry is one of the major industries in southern New Jersey, and the cranberry industry happens to be a very water intensive industry that requires a very high quality of water purity and, accordingly, some development that has been taking place in that area is in the process of jeopardizing this very important industry in my State. In order to avert unpleasant possibilities in the future, we have to take action now to examine preventive meaasures to protect our ground water resources. This hearing is a step in that process.

The problem of hazardous waste contamination of ground water is related to the regulation of hazardous management and the protection of underground water supplies. The Resource Conservation and Recovery Act sets out a regulatory scheme for hazardous wastes. The Safe Drainage Water Act mandates a program for the protection of underground water supplies. Because these two statutes overlap, it has been the decision by Mr. Waxman and myself that our committees should work as closely as possible to attempt to formulate responses to the needs for a national approach toward ground water protection.

Hence, we are here today and we have a very impressive list of witnesses, and I am pleased to partake and look forward to hearing from our colleague from New York.

[Mr. Florio's prepared statement follows:]

OPENING STATEMENT

OF

JAMES J. FLORIO, CHAIRMAN

SUBCOMMITTEE ON TRANSPORTATION AND COMMERCE

Hearing on Hazardous Waste Contamination of Groundwater
August 22, 1980

IMPROPER HAZARDOUS WASTE MANAGEMENT IS THE MOST SERIOUS ENVIRONMENTAL PROBLEM FACING OUR NATION TODAY. IT IS THE ENVIRONMENTAL ISSUE OF THE 80'S. THE FACT THAT HAZARDOUS WASTES CAN CAUSE SERIOUS -- SOMETIMES CATASTROPHIC -- PROBLEMS IS INCONTROVERTIBLE. NAMES SUCH AS LOVE CANAL, VALLEY OF THE DRUMS, AND JACKSON TOWNSHIP SPEAK FOR THEMSELVES AS HAVING BECOME SYNONOMOUS WITH ENVIRONMENTAL ABUSE.

THERE ARE A NUMBER OF MECHANISMS BY WHICH IMPROPERLY MANAGED HAZARDOUS WASTES CAUSE HEALTH AND ENVIRONMENTAL DAMAGES. BY FAR THE MOST COMMON OF THESE MECHANISMS IS THROUGH THE CONTAMINATION OF GROUNDWATER.

PURE GROUNDWATER IS ONE OF THIS COUNTRY'S MOST VALUABLE RESOURCE. PRESENTLY GROUNDWATER SUPPLIES ABOUT 25% OF THE NATION'S FRESH WATER NEEDS AND ABOUT HALF OF THE NATIONAL DRINKING WATER SUPPLY. AND THESE FIGURES ARE LIKELY TO INCREASE IN THE FUTURE.

THE POTENTIAL SIZE OF THE GROUNDWATER CONTAMINATION PROBLEM IS SIGNIFICANT. IN EXAMINING 128 GROUNDWATER CONTAMINATION INCIDENTS, THE CONGRESSIONAL RESEARCH SERVICE FOUND THAT OVER 1300 WELLS WERE CLOSED. TWO OF THESE INCIDENTS ALONE AFFECTED THE GROUNDWATER SUPPLIES OF HALF A MILLION PEOPLE. IN MY OWN STATE OF NEW JERSEY, STATE OFFICIALS HAVE ALREADY CLOSED 500 INDIVIDUAL DOMESTIC WELLS AND 13 WELLS OPERATED BY MUNICIPALITIES AND WATER SUPPLY COMPANIES.

BECAUSE OF THE VERY SLOW MOVEMENT OF GROUNDWATER, THERE IS OFTEN A LONG TIME DELAY BETWEEN A CONTAMINATION INCIDENT AND ITS DETECTION IN AN AQUIFER. GROUNDWATER CONTAMINATION WHICH ORIGINALLY OCCURRED DECADES AGO MAY NOW BE APPEARING IN PARTS OF AQUIFERS BEING USED FOR WATER SUPPLY. SIMILARLY GROUNDWATER CONTAMINATION OCCURRING TODAY MAY NOT APPEAR FOR DECADES. THUS THE ULTIMATE MAGNITUDE OF THE PROBLEM MAY BE MUCH WORSE THAN IT CURRENTLY APPEARS.

THE IMPACT OF GROUNDWATER CONTAMINATION EXTENDS BEYOND THE INCREASED RISK OF CANCER, BIRTH DEFECTS, AND OTHER ADVERSE HEALTH EFFECTS. BUSINESSMEN IN A WIDE VARIETY OF ENTERPRISES -- ESPECIALLY THOSE WHICH DEMAND CLEAN WATER -- COULD SUSTAIN SUBSTANTIAL LOSSES AS A RESULT OF THE PROBLEM. A REAL ESTATE DEVELOPER, FOR

EXAMPLE, COULD EASILY HAVE A PROJECT DEVASTATED BY THE DISCOVERY OF GROUNDWATER CONTAMINATED BY HAZARDOUS WASTES. FARMERS WHO DEPEND UPON GROUNDWATER FOR IRRIGATION COULD FIND THEMSELVES OUT OF BUSINESS.

IN FACT, I AM AFRAID WE MAY FACE A WATER SHORTAGE CRISIS ONE DAY IN THE FUTURE AS SERIOUS OR MORE SERIOUS THAN THE CURRENT ENERGY CRISIS. PURE WATER IS OUR MOST IMPORTANT NATURAL RESOURCE. AND, UNLIKE THE ENERGY SITUATION, WHERE WE CAN SUBSTITUTE COAL FOR OIL OR DEVELOP NEW SOURCES OF ENERGY SUCH AS SOLAR POWER, THERE IS NO SUBSTITUTE FOR WATER.

IN ORDER TO AVERT SUCH UNPLEASANT POSSIBILITIES IN THE FUTURE, WE MUST TAKE ACTION NOW TO EXAMINE PREVENTATIVE MEASURES TO PROTECT OUR GROUNDWATER RESOURCES. THIS HEARING IS A STEP IN THAT PROCESS. THE PROBLEM OF HAZARDOUS WASTE CONTAMINATION OF GROUNDWATER IS ONE THAT IS CLOSELY RELATED TO BOTH THE REGULATION OF HAZARDOUS WASTE MANAGEMENT AND THE PROTECTION OF UNDERGROUND WATER SUPPLIES. THE RESOURCE CONSERVATION AND RECOVERY ACT OR RCRA SETS OUT A REGULATORY SCHEME FOR HAZARDOUS WASTES. THE SAFE DRINKING WATER ACT MANDATES A PROGRAM FOR THE PROTECTION OF UNDERGROUND WATER SUPPLIES.

BECAUSE HAZARDOUS WASTE CONTAMINATION OF GROUNDWATER CLEARLY OVERLAPS BOTH STATUTES, WE HAVE DECIDED THAT A JOINT HEARING OF THE TWO AUTHORIZING SUBCOMMITTEES FOR THE TWO STATUTES WOULD BE THE MOST APPROPRIATE MECHANISM TO INVESTIGATE THE PROBLEM. IT MAY WELL BE THAT SOLUTIONS TO THE PROBLEM WILL REVOLVE ON MORE CLOSELY COORDINATED AND INTEGRATED APPROACHES TO CARRYING OUT THE TWO STATUTES.

Mr. WAXMAN. Thank you very much.
Mr. Lent.

STATEMENT OF HON. NORMAN F. LENT, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK

Mr. LENT. Thank you, Mr. Chairmen, both of you, and I appreciate the opportunity to appear today and to testify on my own behalf and on the behalf of New York State. Assemblyman Thomas Gulotta, 13th District, who is a leader in Nassau County in the fight to protect the water supply.

My interest in being here today arises from the fact that the drinking water supplying the 1.42 million population of Nassau County, Long Island, is obtained solely from three underground aquifers. That is a rather unique circumstance in this country. Unfortunately, the water from the top, shallow aquifer has been serious by contaminated for many years and is unsafe to drink. We, therefore, must do everything possible to insure that the water from the remaining aquifers remains safe to drink.

I believe that in order to effectively deal with the issue of ground water contamination, it must be approached in a logical, rational fashion. Mr. Chairman, I applaud you both for taking such an approach as evidenced by these hearings today. Unfortunately, some do not agree with this approach. Recently the New York Public Interest Research Group—NYPIRG—a New York based public interest advocacy organization, released a report entitled "Toxics on Tap" which describes a 2-year analysis of Long Island's programs to regulate drinking water quality and prevent ground water contamination. This report, while seeking a worthwhile objective, detracts from its credibility by adopting an alarmist tone which has needlessly panicked the public about the quality of Long Island's drinking water.

In response to the NYPIRG study, the Nassau County Department of Health issued a point-by-point rebuttal. In preface to its rebuttal, the county health department said that the NYPIRG study drew conclusions that were "highly speculative, exaggerated, unsubstantiated, and replete with unfounded references and insinuations."

I have attached to my testimony a copy of the Nassau County Health Department rebuttal.[1] Since a representative from NYPIRG will be here to discuss the findings of its report, I believe the record of today's hearing would be incomplete without this rebuttal.

Mr. Chairman, I would like to preface my remarks by saying that, over the years, I have worked closely on many issues with the Nassau County Department of Health, headed by Dr. John J. Dowling, and with his deputy commissioner, Francis V. Padar. I have found them and their staff to be hardworking, highly professional and responsible. They have been instrumental in instigating an aggressive, outreach approach toward protecting and handling Nassau County's water supplies. In fact, protecting the quality of Long Island ground water has been designated by Commissioner Dowling as Nassau County's No. 1 environmental health priority.

[1] The Nassau County Health Department rebuttal referred to by Mr. Lent may be found in the subcommittee files.

Mr. Chairman, when the NYPIRG study was released, there was no chorus of self-interested denials by these Nassau County health officials. From their response, it was apparent that they are well aware of the menace and have been striving to catch up with it.

Here are just some examples of what has, and is, being done:

Nassau County recognized the potential health risks caused by organic chemicals as early as 1976 and initiated a crash innovative program to test all wells for the organic chemicals likely to be present.

The Long Island Regional Planning Board has recently conducted its own $5.2 million water study, which suggested many ways to deal with toxic wastes. Its executive director, Dr. Lee Koppelman, has criticized the NYPIRG report for using "scare tactics" and stated, "Our studies indicate that pulic drinking water which is drawn from the 'magothy' level * * * is a good quality water.

The Hempstead Town Department of Conservation and Waterways disclosed the results of a study of water pollution caused by the careless disposal of used crankcase oil.

About the time the NYPIRG report was being relesed, Governor Hugh Carey signed two bills designed to protect Long Island's water supply from toxic chemicals.

Governor Carey also signed a bill that gives the State's district attorneys the power to prosecute violators of environmental laws.

Clearly, the potential for serious ground water problems in Nassau County exists because the area involved is densely populated, lightly industrialized, has utilized cesspools and septic tanks for sewage treatment for years, and relies on underground aquifers as a sole source of drinking water. Fortunately, the potential for harm has never been realized. In fact, Long Island's drinking water quality is excellent and poses no threat to the health of the public. This result has been achieved by the aggressive approach toward preserving the water quality which has included the activities mentioned above and others which I will now discuss.

Mr. Chairman, at this point, I would only note that one of the ironies of the water quality problem is that it has resulted in part from a decision made in the early 1970's to alleviate another environmental problem. That decision involved the closing of garbage incinerators to protect air quality and the subsequent use of landfills to dispose of garbage. Now, with our increasing concern over ground water contamination, that decision is being reconsidered.

One major step toward abating pollution sources was achieved last year during a hearing on ground water contamination held at my behest on Long Island by the Oversight and Investigations Subcommittee. At that hearing, I revealed a previously secret internal Hooker Chemical Co. memorandum which showed that for 19 years Hooker had been dumping huge quantities of toxic chemical wastes into Long Island landfills.

As a result of this revelation, the New York State Department of Environmental Conservation ordered Hooker to immediately stop dumping. Legal action now is pending against Hooker for damages caused by this dumping and Hooker has been prohibited from dumping any wastes except its cafeteria garbage and paper wastes in the local landfills. Hooker's other wastes are held and hauled out of State for incineration or to approved landfills.

Mr. Chairman, the Nassau County Department of Health has pioneered in sophisticated, comprehensive ground water testing and identification and abatement of polluting sources. The following thumbnail sketch of its efforts will exemplify the variety and extent of actions taken over the years.

In general, ground water sources of drinking water in Nassau County are comprehensively monitored for inorganic as well as organic chemicals contained in spills from gasoline storage tanks and from chemicals listed in prevailing State drinking water standards and interim guidelines.

Regulation of industrial inorganic chemical discharges has been extremely effective. The monitoring program for these chemicals has been in place for many years, and has included testing for the full spectrum of inorganic toxic constituents in all public wells and many observation wells. In fact, the EPA list of 129 priority pollutants contains 13 metals, all of which are monitored routinely in Nassau County waters.

Detection of organic chemicals has been somewhat more difficult because the possible toxicity of trace amount of organic chemicals in drinking water was not known until recent years. Also, analytical procedures and laboratory equipment for testing organics was not generally available until the late 1970's. Since 1977, however, monitoring for organic toxic chemicals has been gradually expanded as quickly as analytical technology and laboratory resources could reasonably be developed.

To date, eight organic chemicals have been on a less extensive basis. Organic chemical contaminants are measured in parts per billion, and while trace levels of these chemicals have been detected in 30 percent of public wells in Nassau County, only 12 of the 438 public wells have levels which pose a potential health risk. These 12 wells are not being used.

Mr. Chairman, it is important to point out that Nassau County's Health Department has been forced to take the initiative in monitoring for organic chemicals. There has been no guidance from the Federal Government, even though the 1974 Safe Drinking Water Act required the EPA to set national standards for safe levels of organic chemicals. It is now 1980 and those standards have not been set. That is a pretty abysmal performance in my view.

In addition, in 1979, the Nassau County Health Department requested and received approval of State legislative funds to test 30 representative wells for the full spectrum of the 129 EPA priority pollutants to be followed by widespread testing for any toxics found in these wells. Special laboratory equipment has been acquired, test protocols developed, and the start of testing is scheduled for August 1980.

More funds currently are being requested to install monitoring wells and study leachate plumes in the ground water for the 129 EPA priority pollutants at two landfills in Nassau County. Testing for other landfills is planned for the future.

In its report, the NYPIRG recommended that each water supply and each discharger test for the 129 EPA priority pollutants. Such a drastic step is unnecessary and could double or triple the cost of water to the consumer. The EPA priority pollutants represent a full spectrum of toxic chemicals which can conceivably be dis-

charged considering all known industrial processes. Therefore, scheduled testing of ground water at 30 representative wells for the 129 priority pollutants, with followup testing for toxics found, should be sufficient.

Another source of pollution in Nassau County has been from nitrates originating primarily from cesspools. Soon, however, this source will no longer pose a problem. Nassau County recognized the need for a sewering system to abate nitrate pollution and a countywide comprehensive sewage disposal plan was developed. Today, 70 percent of Nassau's population is served by sewers. By 1985, 90 percent of Nassau's population will have sanitary sewers.

Mr. Chairman, in concluding my statement, I would like to offer several recommendations which I believe will help to control our growing ground water contamination problem.

First, I would urge quick passage of the superfund bill. Superfund will provide the authority and funds for cleanup of abandoned waste sites which are leaking toxic substances into our water supplies.

Second, I would exhort the EPA to immediately publish its regulations setting standards for acceptable levels of synthetic organic chemicals in drinking water. The 1974 Safe Drinking Water Act demands that EPA regulate them, yet even today, no regulations have been proposed. Synthetic organics are pervasive and highly toxic and demand our immediate action.

Third, I would recommend that the Congress authorize funds for research on ground water quality and improved technology for purifying drinking water. We are only now discovering the extent to which our ground waters are threatened by contamination. Unfortunately, that contamination is far more serious than anyone expected. We must, therefore, funnel more of our time and money into finding solutions to this problem.

This completes my formal statement and if there are any questions, I will be happy to answer them.

Mr. WAXMAN. Mr. Lent, I want to commend you for your statement and for your recommendations. I think those are very worthwhile recommendations for us to look at as we look at the problems that involve overlapping items of legislation, both the Safe Drinking Water Act, RCRA, and now hopefully the soon to be passed superfund.

In your area, what alternatives are there for your district communities who discover their supplies are contaminated? Are they all exclusively relying now on the local health department?

Mr. LENT. Yes, sir, the local health department has a number of laboratories which are available to it and there are, as I say, in place now extensive testing of the water quality for all of the wells. As I said earlier, there are several hundred of those wells and each one of them is being tested in certain respects.

Then we have the 30 wells which will be tested for the full spectrum of the 129 EPA priority pollutants.

Mr. WAXMAN. Should a community find that some of its wells are contaminated, what alternatives are there to that community? Can water be brought in from neighboring communities?

Mr. LENT. What has happened with respect to the wells in the Bethpage water district, which are located close to the Hooker

Chemical plant where there has been some extensive dumping. As I indicated, this was revealed by our own oversight committee last year. Those wells have been closed down and other wells have been dug.

There are applications pending now for one or two water districts along the spine of Long Island to drill wells into the bottom aquifer, the Lloyd aquifer, which until now has been fairly virgin. It has not been sought as a water supply for Long Island, but in at least one or two cases, on a temporary basis, permission is being sought for drilling down into that level.

Mr. WAXMAN. In our subcommittee, as we are looking at the Safe Drinking Water Act, there are those who are urging upon us changes in the law that would not have the Federal Government regulate but leave the regulations solely to the local and State governments. I was wondering if you had any thoughts on that question, to what extent should the Federal Government be involved?

Mr. LENT. Well, I can only speak for my own county where we have found time and time again, whether we are dealing with our own town of Hemstead Water Resources Commission, or Nassau County Health Department, generally speaking the professional level of the people who are working on the county level is higher and more professonal than what we are getting through EPA. In many cases, these older, more experienced professionals are teaching, educating if you will, the younger EPA people who are sent up from Washington.

But certainly I think that EPA ought to at least fix what these standards are under the Safe Drinking Water Act, because what happens is when a trace, so many parts per million of vinyl chloride or something is found in a well, the local health people are at a loss as to whether or not that well must be closed under standards or whether it can continue to be used. We know there are traces of chemicals in practically everything.

We ingest chemicals. Many of us took saccarin in our coffee this morning. Yet if the most minute trace of a chemical is found in a water supply the question arises, what should the local water department or the local health department do. I think these standards should be promulgated.

Mr. WAXMAN. Thank you very much.

Dr. Carter.

Mr. CARTER. Thank you, Mr. Chairman.

I would like to make a statement at this point.

Mr. WAXMAN. Without objection, that statement will be made part of the record.

[The statement of Mr. Carter follows:]

STATEMENT OF TIM LEE CARTER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF KENTUCKY

Mr. CARTER. Mr. Chairman, as a member of the Subcommittee on Health and the Environment, I am proud to have been involved in the development of the Safe Drinking Water Act in 1974, as well as subsequent amendments. In my view, the Safe Drinking Water Act is one of the most important pieces of environmental legislation to come out of the Congress in the last decade.

From time to time, I believe it useful to look at the progress that has been made in assuring a safe supply of drinking water for the American people, and to look in to some of the problems that have been encountered in that process. Today I am pleased that we will have the opportunity to hear from a variety of individuals and organizations about the implementation of this program as it relates to hazardous waste and drinking water.

However, Mr. Chairman, let me say at the outset that when we consider our environmental legislation, it is my view that we must come down firmly in defense of the public's health. As in many similar cases, we will look today at a problem where we must weigh costs and benefits. Clearly, as the superfund legislation demonstrates, there are real costs associated with protecting our aquifers from pollution by hazardous wastes. Moreover, there will be a great deal of uncertainty in our measurements of these costs and benefits, and some will attempt to capitalize on that lack of precision. Nevertheless, the risk of contamination of our drinking water supplies is real, and the resulting risks to health are also serious, and that is why I believe strongly that the burden of proof must be on those who would oppose our efforts to protect this most priceless resource.

Thank you, Mr. Chairman.

I certainly appreciate what the distinguished gentleman from New York had to say, and it seems to me he must have quite a problem there in his area, and I notice he supports the superfund, which I think the majority of this committee also does.

Certainly I would like to see EPA act and set the standards in your area, if you are anxious for that.

Furthermore, I feel that we should authorize funds to find out what toxic substances are in the water and indicate to you the technology for purifying your water.

I regret to see that again the Hooker Chemical Co. is at fault in this area, as it was in Buffalo, N.Y.

Certainly I want to thank you for your remarks and commend you on them.

Mr. WAXMAN. Mr. Florio.

Mr. FLORIO. Yes, Mr. Lent, just to commend you for what you have done. Your three recommendations are very deserving of support by this committee. To raise two points in amplification of what you have stated, I share Chairman Waxman's feeling that this is a subject deserving of a national approach, because you cannot restrict the approach to the local level.

To give an example from my end of the State of New Jersey, an aquifer that stretches on both sides of the Delaware River, from the Pennsylvania side to the Jersey side, is in fact being infiltrated by inappropriately disposed of wastes on the Pennsylvania side which has already resulted in the closing of a municipal drinking water well on the Camden side. So we cannot arbitrarily draw local distinctions or even statewide distinctions for dealing with this problem.

I talked with Mr. Ambro in anticipation of this meeting, your colleague from Long Island, and he does not quite share your views with regard to the accuracy or appropriateness of the NYPIRG reports, and I suppose it is not understandable that there would be

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some differences of opinion as to what the appropriate level of contamination is, inasmuch as there are no effective standards for most of the materials that we are talking about.

There are some 700 chemical contaminants that have been found in water around the Nation, and there are only less than a handful of those materials that have been objective national standards in what is an appropriate level for human consumption.

So again, I suppose this is reenforcing our point, there is a need for national standards for these chemical contaminants so that we can know objectively whether something is appropriate for human consumption or not.

The fact that there are 700, and there is only something less than 20 standards, is something we are going to have to ask our EPA friends about when they testify this morning.

Mr. LENT. Well, my criticism of the NYPIRG report was not that the report was made but it was the manner in which it was made. You have to understand that the release of this report, suggesting as it did that the drinking water supply was an industrial chemical cesspool, that cancer was very likely to be generated from drinking the Long Island water—this had the effect of causing a panic.

The fact of the matter is, while there is a problem and we are alert to it, that the water on Long Island is perhaps the best quality water to be found anywhere in the world. It is fine water. It is better than anything you get down here in Washington, D.C. I invite you to Long Island to just drink the water. It is wonderful water.

We have to be careful with it. And my criticism was that these young people in NYPIRG, idealistically, nonetheless without any opportunities for peer review, without any indication of the credentials of the people who wrote this report, academically or otherwise, whether they had any experience with respect to water supply questions, waste water management and so forth, came out with this report with a big press release and all the devil broke loose, 1,400,000 people.

Now, I have attached to my statement—I refer you particularly to page 2 of the critique form the health department—which indicates some of the shortcomings of this particular report, and otherwise I commend the committee, I think that is itself an important issue and it is one that we should stay on top of.

Mr. FLORIO. Thank you.

Mr. WAXMAN. Mr. Dannemeyer.

Mr. DANNEMEYER. What is NYPIRG? Is it a recognized scientific body of experts or what?

Mr. LENT. That is the organization, the New York Public Interest Research Group, which made the report, that I am somewhat critical of. It describes itself as a not for profit, nonpartisan research and advocacy organization directed by New York State college students. It runs on donated funds and employs a professional fund raiser.

The critique of the Deputy Health Commissioner for Environmental Health, Francis V. Pader, which is attached to my statement, at page 2, points up the lack of objectivity of the report and say, in effect—if I can look at that—that the authors of the report are inexperienced in the complexity of ground water contamina-

tion, water treatment techniques, toxicology of organic chemicals in drinking water, and sources of organic contamination.

The critique further states that no where in the NYPIRG report are the qualifications of the authors in terms of their academic achievement and experience in water supply and waste water management identified.

Further, the critique points up the manner in which the report was prepared without the opportunities for peer review by professional and technical experts in the field and without opportunity for review by official regulatory agencies demonstrates, as the critique says, "complete lack of responsibility for the accuracy and validity of the report as well as its conclusions and recommendations."

Mr. DANNEMEYER. Thank you, Mr. Chairman.

Mr. WAXMAN. Mr. Lee.

Mr. LEE. Thank you, Mr. Chairman.

Mr. Lent, first, I would like to congratulate you for the leadership which I know you have demonstrated in the past in identifying the toxic chemical problems in Long Island. I think you have been a leader, the record clearly demonstrates that, and I would like to personally and publicly compliment you for that.

What I would like to go to is the issue of national standards versus the local standards. You know that our State, the State of New York, has been a leader—my recollection is that some 13 years ago that the taxpayers of our State approved a pure water bond issue in excess of $2 billion to attack and address the cleanup of our sewage treatment plants, the pure water objectives which the Safe Drinking Act I think has in mind, too.

While we are concentrating the effort of trying to level up the standards of some of our sister States, to an improved standard under EPA objectives and goals, do you think that States like New York that have demonstrated superior leadership should have incentive grants or financial rewards above what they are involved currently in the law?

Mr. LENT. Well, my answer would have to be yes. New York has been a leader in many fields, and this is one of them. I can tell you that we passed the bond issue years ago in New York for clean water under the illusion that ultimately we would be reimbursed for that by the Federal Government. To my knowledge, that reimbursement has never been forthcoming and the people of the State still are burdened with the obligation of amortizing that bond issue.

But certainly where a State has been a leader there ought to be some financial recognition of that fact by the Federal Government.

Mr. LEE. I thank you.

I would like to reemphasize that one point, that the State of New York, to the best of my knowledge has not been reimbursed for the 12½ percent share that supposedly was going to flow to it for the initiative that we demonstrated. Hopefully the committee here in addressing this issue, will take that into consideration as well as the potentiality of incentives for States that want to exceed a national standard.

Thank you, Mr. Lent.

Mr. LENT. Thank you.

Mr. WAXMAN. Thank you, we very much appreciate your testimony and your contribution.

Before we begin hearing from our next two witnesses, we have a call to vote on the House floor. This would be, I think, a good time for us to break and respond to that call and return as soon as possible.

[Brief recess.]

Mr. WAXMAN. We would like now to hear from two witnesses, Swep T. Davis, Associate Assistant Administrator for Water and Waste Management, Environmental Protection Agency, and Edward L. Strohbehn, Jr., Executive Director, Council on Environmental Quality.

STATEMENTS OF EDWARD L. STROHBEHN, JR., EXECUTIVE DIRECTOR, COUNCIL ON ENVIRONMENTAL QUALITY, ACCOMPANIED BY DR. DAVID E. BURMASTER, SCIENTIST; AND SWEP T. DAVIS, ASSOCIATE ASSISTANT ADMINISTRATOR, WATER PLANNING AND STANDARDS, OFFICE OF WATER AND WASTE MANAGEMENT, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY GARY N. DIETRICH, ASSOCIATE DEPUTY ASSISTANT ADMINISTRATOR, SOLID WASTE PROGRAMS; AND VICTOR J. KIMM, DEPUTY ASSISTANT ADMINISTRATOR, DRINKING WATER PROGRAMS

Mr. STROHBEHN. Thank you, Mr. Chairman.

My name is Edward L. Strohbehn, from the Council of Environmental Quality. With me is Dr. David E. Burmaster, the scientist on our staff with the expertise on water quality matters. I would like to submit my written statement for the record and emphasize for you the reasons why one of the council's priority concerns is ground water contamination. [See p. 16.]

Ground water is an important source of water. About 50 percent of all U.S. residents use ground water as their principal drinking water supply. About 25 percent of all fresh water used in the country is supplied by ground water.

Ground water is highly vulnerable to contamination. In particular, soils and rock strata do not eliminate many toxic organic chemicals so that they can reach ground water aquifers if improperly disposed of in a recharge area.

Once contaminated, ground water can remain so for hundreds of thousands of years, if not for geologic time. Highly contaminated ground water is essentially not treatable, so that many wells have had to be closed permanently.

There are serious ground water contamination incidents reported from every part of the country. Surprisingly—and unfortunately—the levels of contamination are in many cases orders of magnitude higher than those found in either raw or treated drinking water from the most contaminated surface sources, such as the Ohio and Mississippi Rivers.

Many of the organic chemicials recently found in ground water are known or suspected carcinogens or mutagens. At concentrations on the order of 10 parts per billion, some of the contaminants found in drinking water supplies pose unacceptable health risks to humans.

Let me underscore these facts by noting just a few of the cases of ground water contamination that we know have occurred.

In January 1980, California public health officials closed 39 public wells in the San Gabriel Valley due to trichloroethylene—TCE—contamination. TCE is known to cause cancer in mice. The wells supplied water to nearly 400,000 people in 12 cities, and the pattern of contamination suggests multiple, widespread sources of pollution. One well had 600 parts per billion TCE.

In 1979 a special Massachusetts Legislative Commission on Water Supply found that at least one-third of the Commonwealth's 351 communities had been affected to some degree by organic or inorganic chemical contamination of drinking water supplies. In 22 towns, private and public wells were restricted or closed.

For example, Groveland and Rowley each had to close all of their municipal wells due to trichlorethylene—TCE—contaminations. North Reading found over 900 parts per billion of TCE in two wells supplying 30 percent of the town's water. The maximum contaminant level adopted by the State of Massachusetts for TCE is 10 parts per billion.

Over the past two decades, Hooker Chemical Corp. discharged pesticides, their precursors, and their degradation products into ponds—some lined and some unlined—near Lathrop, Calif. An analysis of water from a highly contaminated well near the location where pesticides were discharged showed that both DBCP and EDB, which are extraordinarily potent carcinogens, are present in large concentrations.

In May 1978, four of the wells that provide 80 percent of the drinking water to Bedford, Mass., were found to be contaminated with up to 2,100 ppb dioxane and up to 500 ppb trichlorethylene. Town officials closed the wells.

In sum, ground water contamination is a serious, national problem—one which warrants priority concern. Over the next several months, CEQ will compile and analyze data which will enable us to assess more accurately the nature and extent of the problem, particularly the health risks involved. EPA has a number of important research efforts underway, and is developing a national ground water strategy. Many States, such as Michigan, Massachusetts, and California, are at the forefront of our efforts to deal with ground water contamination problems. These congressional hearings emphasize the importance that Congress assigns to the issue. Together, all of these efforts will enable us to act responsibly in defining the problem, developing solutions, and implementing programs.

Thank you very much, and Mr. Davis will testify next.

[Testimony resumes on p. 28.]

[Mr. Strohbehn's prepared statement follows:]

STATEMENT OF EDWARD L. STROHBEHN, JR.
for the
COUNCIL ON ENVIRONMENTAL QUALITY
before the
SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT
and the
SUBCOMMITTEE ON TRANSPORTATION AND COMMERCE
of the
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE
U.S. HOUSE OF REPRESENTATIVES

AUGUST 22, 1980

Thank you, Mr. Chairman, for the opportunity to testify on an issue of growing concern. I am Edward L. Strohbehn, Jr., Executive Director of the Council on Environmental Quality. With me today is Dr. David E. Burmaster, a scientist on CEQ's staff who provides the Council with expertise on water quality.

Drinking water drawn from the ground has historically been viewed as a pristine resource. My testimony today focuses on the contamination of drinking water wells by synthetic organic chemicals. However, I will first provide background information on the nature and the size of this resource and on the extent of our reliance on it.

GROUND WATER: CHARACTERISTICS AND USES

Ground water may be defined as subsurface water that occurs beneath the water table in soils or rocks and in geologic formations that are fully saturated. Aquifers, or subsurface, permeable geologic formations that can yield significant amounts of water to wells and springs, underlie most of our country.

The volume of fresh ground water under the United States is estimated to be about 50 times the volume of annual surface water flow. The U.S. Water Resources Council estimates that approximately 36 quadrillion gallons of fresh ground water occur within one half mile of the surface (this

quantity is more than four times the volume of water held in the Great Lakes). The natural water cycle, through rainfall and snow melt, recharges ground water at a rate of approximately 300 trillion gallons per year (or 1 part recharge to 120 parts of total volume). In the absence of human intervention, an equal volume of ground water would be returned to the atmosphere, rivers, or oceans and recycled.

Ground water supplies 25 percent of the fresh water used for all purposes in the country. As shown in Table 1, approximately 30 trillion gallons of fresh ground water were withdrawn for all uses in 1975, with this breakdown by category: irrigation, 69 percent; industry, 14 percent; urban drinking water supplies, 13 percent; rural drinking water supplies, 5 percent. In addition, in the 25-year period 1950-1975, for these 4 categories combined, the use of fresh ground water increased by over 140 percent.

Approximately 50 percent of all U.S. residents rely on ground water as their primary domestic drinking water supply. This requires the use of about 18 percent of the fresh ground water withdrawn each year. Ground water is relied upon for drinking water to differing degrees in different states -- more so in rural than in urban areas.

Shallow ground water is usually of high quality because soils and soil microbes typically can remove many contaminants from water before it reaches an aquifer. Absent human contamination, most shallow and intermediate-depth ground water would meet our intuitive notions for, and legal definitions of, drinking water. The cleansing of water by filtration and adsorption occurs

Table 1

TRENDS IN FRESH GROUND WATER USES AS
A PERCENT OF WITHDRAWALS: 1950-1975

	1950	1960	1970	1975
Total Fresh Ground Water Withdrawals (trillion gallons per year)	12.4	18.3	24.8	29.9
Irrigation (%)	62	68	66	69
Industry (%)	18	13	15	14
Urban Supplies (%)	12	13	14	13
Rural Supplies (%)	8	6	5	5

Note: May not total 100 percent due to rounding.

Source; Murray and Reeves (1972, 1977) and MacKichen and Krammer (1961) based on USGS data.

as the water moves vertically and horizontally. With time, ground water tends toward chemical equilibrium with the minerals it contacts, thereby increasing its mineral content. Fresh ground water may extend to depths of several thousand feet, but the ground water in deep strata usually is highly mineralized water known as brine. In limited areas of the country, even the shallow ground water contains such high concentrations of specific ions or "total dissolved solids" that it is not fit for human consumption, animal consumption, or crop irrigation.

Ground water is highly vulnerable to contamination.

First, while filtration and adsorption cleanse some pollutants from percolating water, soil and rock strata do not eliminate all toxic organic chemicals. Plants and microorganisms, for example, do not break down most chlorinated hydrocarbons, a class of resistant, nonbiodegradable, synthetic organic compounds. Moreover, once water reaches a saturated region, very little, if any further cleansing takes place in the chemically reduced, abiotic, cool, and dark aquifer. Once contaminated, ground water remains so for hundreds or thousands of years, if not for geologic time.

Second, the degree of threat posed to ground water by a surface disposal site varies greatly according to the characteristics of the material underlying the site, and the particular geological and hydrological conditions of the area. For example, a dump sited on top of 50 feet of impermeable clay would pose little threat to an aquifer beneath it, but a landfill on a permeable material poses a serious threat. Human activities in "recharge areas" are of critical importance. The siting of homes, roads, and industry, as well as waste disposal facilities will have a significant effect on the quality of water recharging an aquifer.

Third, ground water moves very slowly, typically less than a few tens of feet per year, depending on the hydraulic gradient and the permeability of the aquifer. A slug of contaminant moving with the ground water will spread by flow and dispersion into a "plume", the dimensions of which are controlled by the structure of the aquifer. However, given enough time, contamination invading a body of natural ground water can move great distances. The behavior and flow of contaminated ground water is not readily predictable. In fact ground water under one location may be heavily contaminated, while a few hundred feet away, the water may remain pristine, due to the vagaries of flow, dispersion, and slowness of travel. The slow movement of ground water can result in long delays and considerable distances between the time and place of contamination and public detection. It may take decades for ground water pollution which occurred in one location to appear in a water well only a few miles away.

Ground water is expensive to test and monitor. Ground water occurs in multiple layers between confining rock strata so several sets of wells are needed to assess the location and rate of travel of a plume of contamination. Once samples are taken, sophisticated and expensive chemical instrumentation must be used to measure the ground water quality. Moreover, to follow migration, these measurements must be repeated at regular intervals.

The qualities and quantities of ground and surface waters are interdependent because they are part of the hydrologic cycle. Fresh water wetlands commonly mark hydrologic connection with both surface and ground waters. Depending on the geology and hydrology of an area, contaminated water in a wetland or other surface water may pollute ground water in an aquifer. Similarly, major withdrawals of ground water can reduce flows in rivers and water levels in lakes and wetlands.

GROUND WATER CONTAMINATION

Recent discoveries of contamination of ground water by toxic synthetic organic chemicals reveal that the levels of contamination are in many cases far higher -- orders of magnitude higher -- than those found in raw or treated drinking waters from the most contaminated surface supplies, such as the Ohio and Mississippi Rivers. Many of the organic chemicals recently found in ground water are known or suspected carcinogens or mutagens. They can represent unacceptable health risks to humans at concentrations on the order of ten parts per billion and below, which are the typical levels of surface water contamination. Many of the organic compounds are tasteless and odorless in drinking water, except at very high concentrations.

Under the provisions of the Safe Drinking Water Act passed in 1974, EPA has promulgated standards (maximum contaminant levels, MCLs) for six pesticides (toxaphene, methoxychlor, endrin, lindane, 2,4-D, and 2,4,5-T) and the trihalomethanes, a class of compounds that result in part from the interaction of chlorine used as a disinfectant with natural organic compounds present in untreated surface waters. Later this year, EPA expects to propose new MCLs for six chlorinated organic compounds (trichloroethylene, 1,1,1-trichloroethane, tetrachloroethylene, carbon tetrachloride, 1,2-dichloroethane, and vinyl chloride) recently found in many ground water supplies.

Numerous incidents of ground water contaminated by toxic organic chemicals have come to light recently. For example:

- In January 1980, California public health officials closed 39 public wells in the San Gabriel Valley due to trichloroethylene (TCE) contamination (TCE is known to cause cancer in mice.) The wells supplied water to nearly 400,000 people in 12 cities, and the

pattern of contamination suggests multiple, widespread sources of pollution. One well, now closed, had 600 ppb TCE.

- In 1979, east of Sacramento, California, TCE concentrations up to 480 ppb were found in 19 rural wells serving private homes and businesses.
- The Velsicol Chemical Company in Memphis, Tennessee, deposited 350,000 55-gallon drums of hazardous wastes at a site near Toone in Hardeman County. Many of the barrels have ruptured and contaminated the ground water with endrin, heptachlor, dieldrin, hexachloroethane, hexachlorobutadiene, and many other toxic, chlorinated hydrocarbons. In one nearby private drinking water well, the concentration of carbon tetrachloride was approximately 50 times the concentration which led Cincinnati Public Health Officials to recommend that citizens not drink Cincinnati's public water.
- In 1979 a special Massachusetts Legislative Commission on Water Supply found that at least one-third of the Commonwealth's 351 communities had been affected to some degree by organic or inorganic chemical contamination of drinking water supplies. Of these incidents, private and public wells were restricted or closed in each of 22 towns. For example, Groveland and Rowley each had to close all of their municipal wells due to trichloroethylene (TCE) contamination. North Reading found over 900 parts per billion (ppb) of TCE in two wells supplying 30 percent of the town's water. The maximum contaminant level (MCL) adopted by the state for TCE is 10 ppb.

- Over the past 2 decades, Hooker Chemical Corporation, now a wholly owned subsidiary of Occidental Petroleum Corporation, discharged pesticides, their precursors, and their degradation products into ponds -- some lined and some unlined -- near Lathrop, California. As can be seen from an analysis presented in Table 2 of water from a highly contaminated well near the location where Hooker discharged pesticides, both DBCP and EDB, which are extraordinarily potent carcinogens, are present in large concentrations.

TABLE 2

Well Near Hooker Chemical, Lathrop, California

Chemical	Concentration (parts per billion)
DBCP	95.
EDB	35.
alpha - BHC	6.
gamma - BHC (lindane)	22.
delta - BHC	3.8
Parathion	4.6
Dimethoate	9.9
DNBP	18.

- Near Princeton, New Jersey, the Jones Industrial Service (JIS) Company has dumped liquid industrial wastes into an unlined, sandy-bottomed "pit". The Frank Kaler family lives nearby, and, until recently, relied on a private well for all domestic water. After a long struggle with various local and state

health officials to have their water checked, chemical analysis showed that several toxic and/or carcinogenic compounds were present in high concentrations. See Table 3.

TABLE 3

The Kaler Family Well near Princeton, New Jersey

Chemical	Concentration (parts per billion)
trichloroethylene	1,530.
trichloroethane	965.
chloroform	420.
carbon tetrachloride	400.
xylenes	300.
toluene	260.
benzene	230.
dichloroethylene	58.
methylene chloride	11.
methyisobutylketone	< 0.1

A 1977 report by the National Academy of Sciences (NAS) for the Environmental Protection Agency helps put these concentrations of toxic substances in perspective. In Table VI-60 in Drinking Water and Health, the NAS reported the highest concentrations of various synthetic organic compounds observed through 1976 in treated drinking water samples. In Table 4, these historical values are contrasted with the much higher values reported in the more recent incidents mentioned above. The NAS reported values are considerably lower than the recent values reported here, and the ground water examples which we discuss are not the worst cases that have been reported.

TABLE 4

Comparison of Concentrations from 1977 National Academy of Sciences "Drinking Water and Health" and 6 Recent Ground Water Contamination Incidents.

Chemical	NAS HIGHEST OBSERVED CONCENTRATION (parts per billion)	GROUND WATER CONTAMINATION INCIDENT (parts per billion)	LOCATION
trichloroethylene	0.5	600.	San Gabriel Valley
		480.	East of Sacramento
		900.	North Reading, MA
		1,530	Kaler Family
gamma - BHC (lindane)	0.01	22.	Lathrop, CA
chloroform	366.	420.	Kaler Family
carbon tetrachloride	5.	400.	Kaler Family
benzene	10.	230.	Kaler Family

In recent years, many small towns and single families have lost their ground water supplies as a result of contamination. There is no way of knowing how many people have been affected, or how they have coped with the problem. Two examples of towns, each with fewer than 15,000 people, where such problems have been documented are Bedford, Massachusetts, (near Boston) and Gray, Maine (near Portland).

In May 1978, four of Bedford's wells, providing 80 percent of the town's drinking water, were found to be contaminated with toxic organic chemicals, including up to 2100 ppb dioxane and up to 500 ppb trichloroethylene (TCE). State and local officials do not know how long the contamination had existed. Its discovery was completely accidental, the result of a resident engineer testing Bedford's water for a paper he was writing. On learning of the problem, town officials closed the wells.

Bedford officials have responsed to this crisis with a restriction on water use, with an increasing block rate water fee, and a ban on new water supply connections. The town also purchased water from four neighboring towns, until the connection with one had to be abandoned, however, when that community lost two of its main wells to contamination by trichloroethylene. The necessity to purchase water from neighboring sources placed a large financial burden on Bedford. In addition, the costs of the engineering studies of the contaminated areas were high, and they continue today.

In Gray, Maine, 16 private drinking water wells had to be closed in 1977 after they were discovered to be contaminated with toxic organic chemicals. The wells were all located near an industrial waste handling facility built in 1972 to process waste oil from the "Tamano" oil spill in Casco Bay. From 1972 until 1977, the McKin Company used the facility

as a transfer station. Materials were mixed, stored in tanks, and shipped to refiners. Approximately, 100,000 to 200,000 gallons were processed annually at the Gray site.

Wastes spilled at the McKin processing facility leached into the ground water. Unpleasant tastes and offensive odors were reported in drinking water from nearby, private wells. Samples of drinking water were submitted to the state laboratory for testing, but the contaminants were not identified. The well water discolored laundry, and so the residents started turning to alternate sources for their water supply, including extensions of the town's piped supply.

In 1977, trichloroethane, trichloroethylene, freon, acetone, xylene, dimethyl sulfide, and various alcohols were identified in 8 private wells within 2,000 feet of the McKin Company. The town health officer ordered 16 contaminated wells in the area capped. The McKin facility was also ordered shut.

As a result of these discoveries, federal and state agencies have increased their monitoring efforts. And, as one might guess, most of this monitoring is concentrated in areas where contamination is already known or suspected. However, there does not exist a uniform, national ground water quality monitoring network similar to the USGS and EPA monitoring networks for surface water quality. Thus, the true extent of the ground water contamination problem is not known.

To improve our understanding of and knowledge about the ground water contamination problem, in April 1980 CEQ asked EPA's Regional Administrators and the Office of Drinking Water for data on several matters including the following:

- the best current estimates of magnitude or extent of ground water contamination, and the costs of dealing with this contamination
- the number of closures of ground water drinking water supplies
- an assessment of the quality and quantity of scientific data on ground water contamination problems and on closures of ground water drinking water supplies
- an assessment, as detailed and quantitative as possible, of the health effects of ground water contamination on the populations served by the ground water.

Over the next several months, we will analyze this and other data that we are obtaining on ground water contamination.

Thank you for this opportunity to testify. I would be pleased to respond to any questions you may have.

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Mr. WAXMAN. Thank you for your testimony, Mr. Strohbehn. Mr. Davis.

STATEMENT OF SWEP T. DAVIS

Mr. DAVIS. Thank you, Mr. Chairman.

My name is Swep T. Davis. I am Associate Assistant Administrator for Water and Waste Management of the Environmental Protection Agency. With me today, to my far left, is Mr. Gary Dietrich, who is Associate Deputy Assistant Administrator for the Office of Solid Waste Management in EPA; and to my immediate left is Mr. Victor Kimm, who is Deputy Assistant Administrator for the Office of Drinking Water.

I want to thank you and the members of both committees, for this opportunity to come before you with a report on ground water contamination and our plans for developing a ground water protection strategy. [See p. 34.]

I come before you today with the distressing news that one of this Nation's most vast and vital natural resources is in serious jeopardy. The problem is national, for the potential sources and routes of contamination may be found wherever people live and work. More than 100 million of our citizens depend in whole or in part on underground sources of drinking water. The prospect that that water may contain high concentrations of toxic chemical compounds compels our immediate attention and action. The story of hazardous wastes and vulnerable ground waters is just beginning to be written, but the opening chapter is enough to predict that this will become the environmental horror story of the eighties—with after effects extending for hundreds of years.

The initially surprising aspect of ground water contamination is that it is happening at all. The conventional wisdom passed down through the centuries and surviving into our own day is that the ground acts as a natural filter, screening out impurities and insuring a pristine source of fresh, pure drinking water. We know now that that natural process can be overwhelmed by the burden our industrial society imposes on it. Let me cite a few cases where that has happened.

Forty-four communities in Masschusetts have been found to have private or public water supplies severely contaminated with one or more synthetic organic compounds; 25 incidents have occurred in Connecticut; 25 in Pennsylvania; 24 in New York; over 200 wells in California have been contaminated and one or more incidents have been reported in each of 20 other States. The remaining States cannot be presumed to be untouched, we simply do not have data on them.

Approximately 100 drinking water wells surrounding a municipal landfill in Jackson Township, N.J., have been closed because of organic chemical contamination. Analysis of water samples there showed choloform, benzene, toluene, trichloroethylene, ethylbenzene, and acetone—all of them toxic if not carcinogenic compounds.

As of March 1980, the Office of Drinking Water compiled and analyzed over 8,000 tests for volatile organic compounds which had been performed on well waters by State agencies. Chlorinated organic solvents were found most frequently, sometimes at high levels. Trichloroethylene, an industrial solvent and degreaser some-

times also used as a septic tank cleaner, was found in one-third of the samples treated.

Last year in Connecticut, a State survey of water plants serving 1,000 people or more resulted in the detection of some quantity of volatile organic contamination in 87 percent of the wells tested.

Note that the contaminants in all these cases were synthetic organic chemicals. We know that some of these compounds are cancer causing in laboratory animals. Some are suspected carcinogens. Many are highly toxic. But there are hundreds of thousands of chemical compounds and we know very little about the health effects of most of them. There are too many of them, coming too fast, for research to keep up. Moreover, it is many times more difficult and expensive to detect and attract contaminants in groundwater than it is in surface waters.

A contaminant that penetrates groundwater tends to form a "plume" of highly contaminated water, moving slowly through the aquifer for years, decades, and even longer. We measure river flow in feet per second, groundwater movement in feet per year.

Determining that a plume exists is enormously difficult. Monitoring wells are expensive and may easily miss narrow streams of contamination in a large aquifer. And if you should happen to find a contamination plume, what are you going to do about it? In most instances, the answer is shut down the water supply wells. In some cases, it is possible to cleanse contaminated segments of aquifers but it involves large quantities of water, usually costly treatment techniques, and it is not always practicable, either economically or technically.

In a typical case, such as South Brunswick, N.J., determining the extent and severity of a plume emanating from one single source in a shallow aquifer requires dozens of monitoring wells and hundreds of samples. It also takes a great deal of time and several hundred thousand dollars. If the geology is more complex or several potential contamination sources exist, the cost will be on the order of $0.5 million. In a case where the aquifer is deep or surface features cannot help in determining the hydrogeology, costs could soar to $2 or $3 billion.

I should also point out that treating contaminated ground water is not a viable option for most systems. The new equipment for treatment processes and increased operating costs would be far out of reach for the typical groundwater system. The hard economic realities would lead to the same conclusion: shut down the water wells.

Ben Franklin's axiom, "An ounce of prevention is worth a pound of cure," certainly applies in this situation. The economic impact of a badly contaminated aquifer has repercussions that extend far beyond detection costs; it may include the expense of a new water supply and treatment plant, effects on property values, production losses and health expenses.

The prevention of groundwater pollution has a price tag attached to it, yes, but that price ought to be paid in advance by the polluter, not passed on to the citizen-victims of the year 2000 or 2100. No industry has a natural right to dispose of its hazardous wastes or operate in ways that threaten the environment today and in years to come.

What, then, are the sources of groundwater contamination? Groundwater is vulnerable to contamination from a variety of sources. Subsurface waste disposal systems and buried storage tanks are a primary concern because of the large number of sites and the potential for bacterial and chemical contamination.

Improper disposal of municipal and industrial wastes also contaminates groundwater. One EPA report estimated that 15 percent of 378 million tons of liquid and solid industrial waste generated in 1978 was hazardous, a figure expected to grow 3.5 percent per year. There are studies estimating that 75 percent of all active and inactive disposal sites leak contaminants into the ground and groundwater. A report by Fred C. Hart Associates estimates the number of active identified landfills at 75,500, abandoned landfills at 100,000, and of these active and inactive sites, 54,644 contain potentially dangerous amounts of hazardous wastes.

Our potential sources of contaminants of ground water include radioactive waste disposal sites, highway de-icing salts, contamination from abandoned wells, improper disposal of municipal waste water and injection wells of various kinds. Groundwater can also be contaminated naturally with radium or radon, arsenic and other inorganic toxic chemicals.

Worthy of special note are surface impoundments, commonly referred to—even in the Safe Drinking Water Act—as pits, ponds and lagoons. Such facilities are used for disposal, treatment, and storage purposes; they range in size from a few hundred square feet to hundreds of acres. I understand the committees have a particular interest in these constructions and are aware of the study the Agency conducted on them. Our study, done in cooperation with the States, was designed simply to make an initial assessment of the number of surface impoundments and their potential for contaminating ground water. The data generated to date are preliminary but sufficient to offer the following information.

Almost 181,000 active impoundments have been identified. In the industrial category 10,800 sites containing a total of 25,750 impoundments have been located.

Analyses of the data on 8,200 industrial sites which have been assessed show that 72 percent are unlined and only 700 are known to be monitored. At 35 percent of the sites one or more impoundments contain liquid wastes that may be considered hazardous according to a ratings system based on the Standard Industrial Classification Code.

Nearly 30 percent of the assessed sites are unlined and located in areas where thin or very permeable soils afford little protection to usable aquifers.

Mr. FLORIO. Do you have any figures on the percentage of those holding sites or lagoons that are in conjunction with the Clean Water Act disposal facilities? That is, holding lagoons that are being held for purposes of——

Mr. DAVIS. Waste treatment facilities?

Mr. KIMM. We will provide the number—go back and try to identify the number. The problem there clearly is that the permit typically deals with effluent, that is material that goes over the effluent, and what we are beginning to become increasingly con-

cerned about is the contribution to groundwater contamination that may be taking place as part of the facility.

Mr. FLORIO. Our committee is concerned about it, too, and we are trying to work that out. I would like to get some information as to the extent of the overall problem that that represents, the overall problems of holding lagoons contaminating groundwater. Thank you.

Mr. DAVIS. Mr. Chairman, we think our surface impoundment assessment was a worthwhile, if sobering effort. When all the data have been analyzed and studied, we will have a better insight into what needs to be done with at least some of them. We expect the final SIA report will be out by the end of the year.

I think it is important to put all the facts and figures I have cited into perspective. Just how serious and extensive is the occurrence of groundwater contamination? The fact is we don't know precisely. The actual magnitude of the problem is unknown, which leaves us with the dual problem of detection and protection.

As I mentioned, monitoring is a difficult and costly undertaking. Our most conservative estimates would suggest that only a small percentage of the Nation's aquifers have been irretrievably impaired by contamination. These happen to be in the highly populated areas, so the impact of their ruination is disproportionately high. However, we know that the kinds of sources and practices that led to their loss can be found in many parts of the country.

Our studies of surface impoundments, waste disposal sites and other potential pollution sources demonstrate that we are faced with a national problem. However, it is a problem that can be stopped. We can do nothing about the most seriously damaged aquifers, those known and those not yet discovered, but we can act to prevent the same loss from occurring elsewhere.

This, then, Mr. Chairman, is an argument in support of preventive action, the very approach provided by the Congress in part C of the Safe Drinking Water Act. Our underground injection control program and sole source aquifer program are preventive in the first place.

Part B of the Safe Drinking Water Act provides, in the drinking water standards, the last bastion of defense against human consumption of dangerous contaminants, but as mentioned earlier, systems drawing on groundwater typically cannot afford the treatment required to bring chemically contaminated water into conformity with national standards of public health safety.

If, then, one can accept that a serious problem exists and calls for preventive action, the question is what is being done about it?

Numerous Federal laws and State programs besides those under the Safe Drinking Water Act, deal in some way with groundwater protection or management. One is the Clean Water Act (CWA). Although there are specific references to groundwater in CWA, problems in interpretation and enforcement, and lack of resources, have deferred action that would affect groundwater. Nevertheless, some provisions of CWA have increased groundwater protection.

The water quality management program required by section 208 has served as a catalyst for the development of State ground water management programs. Grants to the States for pollution control

programs provided under section 106 have strengthened State abilities in ground water protection.

The Resource Conservation and Recovery Act of 1976 provides for control of the land disposal of municipal waste and generation, treatment, storage, and disposal of hazardous waste.

The Surface Mining Control and Reclamation Act of 1977, under the administration of the Department of the Interior, provides authority to provide surface mine pollution. Protection of ground waters is explicitly included. The Uranium Mill Tailings Radiation Control Act of 1978 mandates EPA to establish minimum radiation standards for uranium mill tailings and the Nuclear Regulatory Commission to implement and enforce the standards.

Approximately 60 percent of the States rely on general laws and the basis for ground water protection.

A broad extrapolation from data collected regarding the number of person/years involved in ground water protection efforts indicate that only about 525 person/years of professional/technical effort are expended each year by all the States combined. Level of concern varies tremendously between States, but 40 percent—less than half of them—are either taking or have taken steps to develop specific standards to protect ground water quality.

In short, although the Nation has a number of tools at hand to protect ground water, there is no coherent, integrated national approach.

Early last winter, EPA Administrator Douglas Costle directed that an Agency Groundwater Protection Strategy be developed as a framework for coordinated action among the Federal, State, and local governments. This effort was to identify national goals for protection of ground water quality; management priorities; control mechanisms; Federal, State, and local government roles; and research needs.

To save time, Mr. Chairman, I will not go into detail of how that process has worked. I would add there has been an extensive public participation effort to bring in interested parties of all impacted areas in the country—Government, business, environmentalists—and that there are a number of very, very difficult and troublesome issues and problems being addressed by that effort.

Mr. Kimm, if you desire later on, we can go into more detail about it.

It is our hope that the process will result in an Agency strategy early next year, a strategy that will reflect the views of all interested parties, a strategy that we can hope will merit national support and cooperation.

By way of a final word, Mr. Chairman, I would only say that the ground water contamination problem is very real and quite serious. Yet we believe we have discovered it soon enough to give us time to act, to prevent the predictable corruption of the larger part of that vital and irreplaceable resource.

We hope the committee will agree that the development of a ground water protection strategy holds promise and that the Congress previous commitment to preventive action is a policy that should be continued. The evidence that ground water is vulnerable is abundant. The likelihood of further deterioration nationally is

clear. The need for preventive action is compelling. We seek your support and advice.

I would add one further word, Mr. Chairman, that in an attempt to expose, a perception has been put forward by many people that EPA or the Federal Government in general have been unresponsive to the hazardous waste problems, including the ones being discussed here today. I think that something that is often overlooked that I think many of you are aware of, however, is that this problem was created over the last 30 or 40 years. It is not a simple problem, rather it is tied to the very infrastructure of this Nation's entire economy, and it will not be solved overnight.

We have done many things in the last few years to try to deal with it. We have reprogramed several hundred people to deal with the abandoned sites, to speed up promulgation of regulations under the Drinking Water Act and the Resource Conservation and Recovery Act. Thousands of sites, abandoned sites, have been investigated.

There have been numerous lawsuits, some of them involving criminal actions, and numerous very critical, important regulations have been put out. They do not do enough and EPA has never said they do enough. That work is continuing and I expect in the fall you will see additional regulations and you will probably see work beyond that before this problem is solved.

Thank you. If you have any questions, we would be glad to try to answer them.

[Testimony resumes on p. 62.]

[Mr. Davis' prepared statement and attachments follow:]

STATEMENT OF
SWEP T. DAVIS
ASSOCIATE ASSISTANT ADMINISTRATOR
FOR WATER AND WASTE MANAGEMENT
ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE JOINT HEARING OF THE
SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT
AND THE
SUBCOMMITTEE ON TRANSPORTATION AND COMMERCE
HOUSE OF REPRESENTATIVES
AUGUST 22, 1980

My name is Swep T. Davis. I am Associate Assistant Administrator for Water and Waste Management of the Environmental Protection Agency. Mr. Chairman, I want to thank you and the members of both Committees for this opportunity to come before you with a report on ground water contamination and our plans for developing a ground water protection strategy.

THE EMERGING PROBLEM OF GROUND WATER CONTAMINATION

I come before you today with the distressing news that one of this nation's most vast and vital natural resources is in serious jeopardy. Our ground waters, long considered virtually pollution-free, are threatened by ruinous contamination. The problem is national, for the potential sources and routes of contamination may be found wherever people live and work. The problem is serious, for the intruding contaminants are often highly toxic, sometimes cancer-causing. More than one hundred million of our citizens depend in whole or in part on underground sources of drinking water. Each day more than ten billion gallons of ground water are withdrawn for use in American homes. Another seventy billion gallons are drawn for agricultural purposes. The prospect that that water may contain high concentrations of toxic chemical compounds compels our immediate

attention and action. The story of hazardous wastes and vulnerable ground waters is just beginning to be written, but the opening chapter is enough to predict that this will become the environmental horror story of the eighties -- with after-effects reaching into the next millenium.

In my testimony today I propose to outline what we know about the extent and nature of ground water contamination, its sources and its seriousness. Then I shall report on what EPA is doing under our statutory authorities and mandates to protect the quality of this vital national resource.

NATURE OF GROUND WATER

First, a few notes on ground water itself. Underlying most of the United States are water-bearing formations (called aquifers) of such enormous capacity that their volume is far greater -- perhaps fifty times greater -- than the combined flow of all the nation's lakes, rivers, and streams. With the slow patience that only Nature knows, ground water inches its way through a maze of infinitesimal cracks and fissures, through compacted beds of glacial sands and gravel, sometimes taking a year to traverse a mere thirty yards, a human lifetime to travel a mile to two. A given drop of today's rain that soaks through permeable soils into one of our aquifers may not see daylight again until the twenty second century or beyond, then to replenish a lake or a stream a few miles away. Only the vastness of our water-bearing formations can account for the huge volumes of water they provide to man's intervening

wells and nature's river beds. Ground water, then, is almost everywhere beneath us, a virtual ocean of fresh water, oozing through the earth, an awesome natural resource easily vulnerable to long term damage.

GROUND WATER CONTAMINATION

The initially surprising aspect of ground water contamination is that it is happening at all. The conventional wisdom passed down through the centuries and surviving into our own day is that the ground acts as a natural filter, screening out impurities and ensuring a pristine source of fresh, pure drinking water. We know now that that natural process can be overwhelmed by the burden our industrial society imposes on it. Let me cite a few cases where that has happened.

44 communities in Massachusetts have been found to have private or public water supplies severely contaminated with one or more synthetic organic compounds; 25 incidents have occurred in Connecticut, 25 in Pennsylvania, 24 in New York, over 200 wells in California have been contaminated and one or more incidents have been reported in each of 20 other States. The remaining States cannot be presumed to be untouched, of course; we simply do not have data on them.

Approximately 100 drinking water wells surrounding a municipal landfill in Jackson Township, New Jersey, have been closed because of organic chemical contamination. Analysis

of water samples there showed choloform, benzene, toluene, trichloroethylene, ethylbenzene, and acetone -- all of them toxic if not carcinogenic compounds.

As of March 1980, the Office of Drinking Water compiled and analyzed over 8,000 tests for volatile organic compounds which had been performed on well waters by State agencies.* Chlorinated organic solvents were found most frequently, sometimes at high levels. Trichloroethylene, an industrial solvent and degreaser sometimes also used as a septic tank cleaner, was found in one-third of the samples tested.

Last year in Connecticut, a State survey of water plants serving a thousand people or more resulted in the detection of some quantity of volatile organic contamination in 87 percent of the wells tested. One limited example dramatizes the problem. In early 1979, benzene was discovered in eleven private drinking water wells in Brookfield, Conn. This contamination was severe enough that citizens were warned not to drink, bath, or use the water while the Connecticut Departments of Health and Environmental Protection tried to remedy the situation. Since that time the gasoline station responsible for the underground storage tank leak has been working with the State agencies to effect a

/* cf Appendices to Planning Workshops to Develop Recommendations for A Ground Water Protection Strategy. Office of Drinking Water, U.S.E.P.A., June, 1980.

ground water recovery and flushing system for the aquifer and to provide the affected families with potable water. It has been frustrating for the citizens and for the experts that there are not "quick fix" technologies available to provide relief from this sort of contamination.

Because of synthetic organic contamination, Nassau and Suffolk Counties, in New York, closed 23 and 13 public water supply wells, respectively. Nearly two million people are served by those contaminated supplies. The New York Public Interest Research Group (NYPIRG) has recently issued a major study of Long Island's ground water problems, drawing on EPA data and other sources. That report confirms that all three of the island's principal aquifers are seriously and dangerously contaminated.

Note that the contaminants in all these cases were synthetic organic chemicals. We know that some of these compounds are cancer-causing in laboratory animals. Some are suspected carcinogens. Many are highly toxic. But there are hundreds of thousands of chemical compounds and we know very little about the health effects of most of them. There are too many of them, coming too fast, for research to keep up. And we know least of all about the impact on human health of various combinations of compounds. The possible synergistic effect of mixed contaminants is a question as elusive as it is frightening.

But we do know that the most frequently found industrial solvents are dangerous to human health. When they appear in ground water they are often in high concentrations. Aquifers do not provide the natural dilution or flushing that occurs in surface waters. A contaminant that penetrates ground water tends to form a "plume" of highly contaminated water, moving slowly through the aquifer for years, decades, and even longer. We measure river flow in feet per second, ground water movement in feet per year.

Determining that a plume exists is enormously difficult. Monitoring wells are expensive and may easily miss narrow streams of contamination in a large aquifer. And if you should happen to find a contamination plume, what are you going to do about it? In most instances, the answer is "Shut down the water supply wells." In some cases, it is possible to cleanse contaminated segments of aquifers but it involves large quantities of water, usually costly treatment techniques, and it is not always practicable, either economicially or technically.

In a typical case, such as South Brunswick, New Jersey, determining the extent and severity of a plume emanating from one single source in a shallow aquifer requires dozens of monitoring wells and hundreds of samples. It also takes a great deal of time and several hundred thousand dollars. If the geology is more complex or several potential contamination sources exist, the cost will be on the order of $.5 million. In a case where

the aquifer is deep or surface features cannot help in determining the hydrogeology, costs could soar to two or three million dollars. Therefore the more common alternative of closing the wells and seeking water elsewhere is the inexorable solution for most communities.

I should also point out that treating contaminated ground water is not a viable option for most systems. The new equipment for treatment processes and increased operating costs would be far out of reach for the typical ground water system. The hard economic realities would lead to the same conclusion: shut down the water wells.

Ben Franklin's axiom, "An ounce of prevention is worth a pound of cure", certainly applies in this situation. The economic impact of a badly contaminated aquifer has repercussions that extend far beyond detection costs; it may include the expense of a new water supply and treatment plant, effects on property values, production losses and health expenses. The prevention of ground water pollution has a price tag attached to it, yes, but that price ought to be paid in advance by the polluter, not passed on to the citizen-victims of the year 2000 or 2100. No industry has a natural right to dispose of its hazardous wastes or operate in ways that threaten the environment today and in years to come. The people, on the other hand, and indeed the land itself, have a compelling right to reasonable protection from practices and substances that jeopardize human health and natural resources.

SOURCES OF CONTAMINATION

What, then, are the sources of ground water contamination? Ground water is vulnerable to contamination from a variety of sources. Subsurface waste disposal systems and buried storage tanks are a primary concern because of the large number of sites and the potential for bacterial and chemical contamination.

Improper disposal of municipal and industrial wastes also contaminates ground water. During the past several years, various studies have reported or confirmed aspects of the problem. One EPA report estimated that 15 percent of 378 million tons of liquid and solid industrial waste generated in 1978 was hazardous, a figure expected to grow 3.5 percent per year. There are studies estimating that 75 percent of all active and inactive disposal sites leak contaminants into the ground and ground water. A report by Fred C. Hart Associates estimates the number of active identified landfills at 75,500, abandoned landfills at 100,000, and of these active and inactive sites, 54,644 contain potentially dangerous amounts of hazardous wastes.

Other potential sources of contaminants of ground water include radioactive waste disposal sites, highway de-icing salts, contamination from abandoned wells, improper disposal of municipal waste water and injection wells of various kinds. Ground water can also be contaminated naturally with radium or radon, arsenic and other inorganic toxic chemicals. And we are concerned about the possible effects of depletion, or over-withdrawal of ground water that may lead to salt water intrusion, for example.

Worthy of special note are surface impoundments, commonly referred to --even in the Safe Drinking Water Act -- as pits, ponds, and lagoons. Such facilities are used for disposal, treatment, and storage purposes; they range in size from a few hundred square feet to hundreds of acres. I understand the Committes have a particular interest in these constructions and are aware of the study the Agency conducted of them. Our study, done in cooperation with the States, was designed simply to make an initial assessment of the number of surface impoundments and their potential for contaminating ground water. We wanted to get a general idea of the dimensions of the problem that might be posed by such impoundments. The data generated to date are preliminary but sufficient to offer the following information.

Almost 181,000 active impoundments have been identified. In the industrial category 10,800 sites containing a total of 25,750 impoundments have been located.

Analyses of the data on 8,200 industrial sites which have been assessed show that 72% are unlined and only 700 are known to be monitored. At 35% of the sites one or more impoundments contain liquid wastes that may be considered hazardous according to a ratings system based on the Standard Industrial Classification Code.

Nearly 30% (2166) of the assessed sites are unlined and located in areas where thin or very permeable soils afford little

protection to usable aquifers. About one third of these unlined sites (728) may be located, according to preliminary investigation, within one mile of a water well which would be in the path of contaminated ground water flowing from these sites.

We think our Surface Impoundment Assessment (SIA) was a worthwhile, if sobering, effort. When all the data have been analyzed and studied, we'll have a better insight into what needs to be done about the problem. RCRA, of course, gives us authority to deal with at least some of them. The final SIA report will be out by the end of the year. Should additional regulatory requirements be indicated, we shall, of course, inform the Congress, the States, and the public and involve all of them in the rule-making process.

THE PROBLEM IN PERSPECTIVE

I think it is important to put all the facts and figures I have cited into perspective. Just how serious and extensive is the occurrence of ground water contamination? The fact is we don't know precisely. The actual magnitude of the problem is unknown, which leaves us with the dual problem of detection and protection. As I mentioned, monitoring is a difficult and costly undertaking. Our most conservative estimates would suggest that only a small percentage of the nation's aquifers have been irretrievably impaired by contamination. These happen to be in highly populated areas, so the impact of their ruination is

70-971 O - 81 -- 4

disproportionately high. However, we know that the kinds of sources and practices that led to their loss can be found in many parts of the country. Some contaminants are so ubiquitous we are planning to set maximum allowable levels for them in drinking water.

The important point, I think, is that the proven instances of contamination clearly establish the potential for similar contamination elsewhere, wherever similar conditions exist. Our studies of surface impoundments, waste disposal sites and other potential pollution sources demonstrate that we are faced with a national problem. However, it is a problem that can be stopped. We can do nothing about the most seriously damaged aquifers, those known and those not yet discovered, but we can act to prevent the same loss from occurring elsewhere.

This, then, Mr. Chairman, is an argument in support of preventive action, the very approach provided by the Congress in Part C of the Safe Drinking Water Act. Our Underground Injection Control program and Sole Source Aquifer program are preventive measures to ensure that ground water contamination does not happen in the first place. Obviously, these two programs do not address every threat to ground water quality. I cite them to emphasize the importance of preventive action and to pay tribute to the Congressional foresight and leadership that has already established the need for and legitimacy of governmental action before the predictable damage is done.

Part B of the Safe Drinking Water Act provides, in the drinking water standards, the last bastion of defense against human consumption of dangerous contaminants, but as mentioned above, systems drawing on ground water typically cannot afford the treatment required to bring chemically contaminated water into conformity with national standards of public health safety.

If, then, one can accept that a serious problem exists and calls for preventive action, the question is what is being done about it?

EXISTING GROUND WATER PROTECTION EFFORTS

Numerous Federal laws and State programs deal in some way with ground water protection or management. For instance:

- The Clean Water Act - Although there are specific references to ground water in CWA, problems in interpretation and enforcement, and lack of resources, have deferred action that would affect ground water. Nevertheless, some provisions of CWA have increased ground water protection. The water quality management program required by Section 208 has served as a catalyst for the development of State ground water management programs. Grants to the States for pollution control programs provided under Section 106 and the creation of coordination mechanisms such as State/EPA agreements have strengthened State abilities in ground water protection.

- Safe Drinking Water Act - Several provisions of the SDWA relate to ground water protection: the UIC program establishes minimum standards for injection well design and operation and State program requirements is intended to protect only ground waters that are current or potential sources of drinking water.

- Another provision of the SDWA is the Sole-Source Aquifer Protection Program (Section 1424(e) which protects recharge zones from the Federally funded projects that might contaminate them. Non-federally funded projects are not regulated.

- The Resource Conservation and Recovery Act (RCRA) of 1976 provides for control of the land disposal of municipal waste and the generation, treatment, storage, and disposal of hazardous waste. EPA regulations provide for a manifest system to track hazardous wastes from generation to ultimate disposal sites. They also provide the permitting of hazardous waste management facilities, including technical requirements for disposal sites and monitoring. The Act also provides for Federal standards for disposal of nonhazardous waste, but these are not Federally enforceable.

- The Surface Mining Control and Reclamation Act of 1977 under the administration of the Department of the Interior provides authority to control surface mine pollution. Protection of ground waters is

explicitly included. The Uranium Mill Tailings Radiation Control Act of 1978 mandates EPA to establish minimum radiation standards for uranium mill tailings and the Nuclear Regulatory Commission to implement and enforce the standards.

- Other EPA laws such as the Toxic Substances Control Act (TSCA) and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) have the clear potential in certain circumstances to ban substances that are of particular danger.

EXISTING STATE EFFORTS

Approximately 60 percent of the States rely on general laws as the basis for ground water protection. Few if any States have a program to protect ground water from all major sources of contamination. Typically, a public health agency, an environmental agency, and perhaps a third agency responsible for ground water quality issues share authority, with the ultimate form and organization of ground water protection efforts dependent on State staffing and budgeting limitations.

A broad extrapolation from data collected regarding the number of person-years involved in ground water protection efforts indicate that only about 525 person-years of professional/technical effort are expended each year by all the States combined. Level of concern varies tremendously between States, but 40 percent --

less than half of them -- are either taking or have taken steps to develop specific standards to protect ground water quality.

In short, although the nation has a number of tools at hand to protect ground water, there is no coherent, integrated national approach. The States have responsibility for the management and protection of ground water. Only in recent years did Federal statutes put EPA into the picture. These new programs are just getting started but it is already apparent that more effective coordination between federal, state and local programs is badly needed.

EPA'S PROTECTION STRATEGY

Early last winter, EPA Administrator Douglas Costle directed that an Agency Ground Water Protection Strategy be developed as a framework for coordinated action among the Federal, State, and local governments. This effort, he instructed, was to identify national goals for protection of ground water quality; management priorities; control mechanisms; Federal, State and local government roles; further research required and short and long-term actions.

Because this strategy has such important national implications, I think it is worth taking a few moments of the Committee's time to explain both what it will accomplish and how we are going about its development.

Since ground-water contamination problems concern government, industry, environmentalists and the public, the Agency is seeking

public participation in the formulation of its ground water protection strategy. A three-phase approach to developing a ground water protection strategy was devised.

- Phase I involved the assembling of current information on ground water use and pollution, state laws and programs, and the state of the art in ground water protection.* Early this year EPA officials held 30 meetings with over 400 representatives of 105 organizations to discuss our intentions. Special emphasis was given to obtaining the advice of representative state officials.

- Phase II consisted of a pair of workshops held in June to which 80 people representative of state, local, environmental, business and industry, public interest, and professional entities were invited to explore and analyze the issues presented in working papers and to recommend preferred policies.** We hope that in September, a draft strategy that reflects the views of the workshops will be published in the Federal Register and widely distributed.

/ * ibid, p.4

/** cf Planning Workshops to Develop Recommendations For a Ground Water Protection Strategy, Office of Drinking Water, U.S.E.P.A. June 1980

This document will, of course, be sent to the Committees and their staffs.

- Phase III will be public meetings on the subject, held in at least five locations throughout the nation during late October and November.

It is our hope that the process will result in an Agency strategy early next year -- a strategy that will reflect the views of all interested parties, a strategy that we can hope will merit national support and cooperation.

SCOPE/CONTENT OF STRATEGY**

What does the strategy involve? It addresses a series of key questions, chief among which is, "What should be our national goal for the protection of ground water?" What level of protection is needed? Should all ground waters be protected up to a drinking water standard? Or protected to the levels necessary for projected future use, such as for drinking water or agricultural irrigation? Should only ground water that is to be used as a drinking water source be protected? Or should we protect all ground waters at their present levels of quality, i.e., prevent any degradation? Should contaminated aquifers be restored?

/ ** ibid, pg. 16

A second set of issues concerns management approaches to protection of ground water. Under the assumption of limited resources, what management processes for setting priorities for regulatory and other actions should be established? Should ground waters be classified according to vulnerability to contamination, value of yield, or use designation (i.e., drinking water, irrigation, industrial supply)? Should contaminants be classified on the basis of toxicity? Should sources of pollution be classified, i.e., singled out for high priority control -- industrial leach fields, for instance?

Third, how should contamination be controlled? What would be an appropriate set of control mechanisms, based on economic, technological and political feasibility, for dealing with ground water contamination? Four approaches have been suggested. A "best management practice" approach, or guidelines for various situations, would offer flexibility for dealing with individual cases. A technology-based or effluent standards approach would be based on industry-specific or process-specific standards relating to the handling, storage and disposal of potential contaminants. A ground-water quality approach would focus directly on ground water quality, rather than focusing on activities that might contaminate. A final approach might be economic incentives and other approaches such as specific discharge allocations, ground water contamination fees, and non-compliance fees.

The roles that Federal, State and local governments should play in carrying out aspects of the strategy are complex. This is the fourth subject area that the Strategy addresses. Should states take primary responsibility for enforcing federally developed national standards? Or should states develop their own plans and programs, with the Federal government providing support and technical assistance only? Should the Federal government assume new responsibilities? Should states prepare and submit program plans for Federal approval and support?

Finally, the Strategy will identify research needs -- for there are considerable gaps in our knowledge -- and point to short term and long term activities needed to enhance ground water protection efforts.

We have high hopes that this major Agency effort will result in several important results:

- a greater national recognition and understanding of ground water problems.

- a clear enunciation of the problems and issues being addressed.

- a national goal and program with fully defined Federal, State, and local roles.

- a comprehensive Agency ground water protection policy which will apply to all programs affecting ground water from data collection to management.

- a more productive set of relationships with State and local government and with other Federal agencies in addressing our mutual concerns.

- a meaningful time schedule which includes a short-term action plan and a strategy for dealing with ground water problems over a long term.

SUPERFUND

Implicit in this testimony is the fact that there are gaps in existing authorities. With the proposed Superfund legislation we can fill in many of the gaps.

Let me relate how Superfund will help resolve problems caused by abandoned waste disposal sites. The program embraces four principles of action:

First, it provides the federal government with both the authority and the resources to clean-up abandoned sites.

Second, it permits speedy action, prior to long drawn-out judicial proceedings, to abate environmental and public health threats posed by spills of oil and hazardous substances and by abandoned hazardous waste sites.

Third, it imposes joint, several, and strict liability on those who caused or are causing the problem. This provision serves as both a deterrent and as a means of recovering clean up costs.

Fourth, it restricts Federal action to those instances in which the responsible party will not act or cannot be promptly identified.

We feel that enactment of Superfund is crucial to solving many major contamination problems in our entire environment.

UIC-RCRA COORDINATION

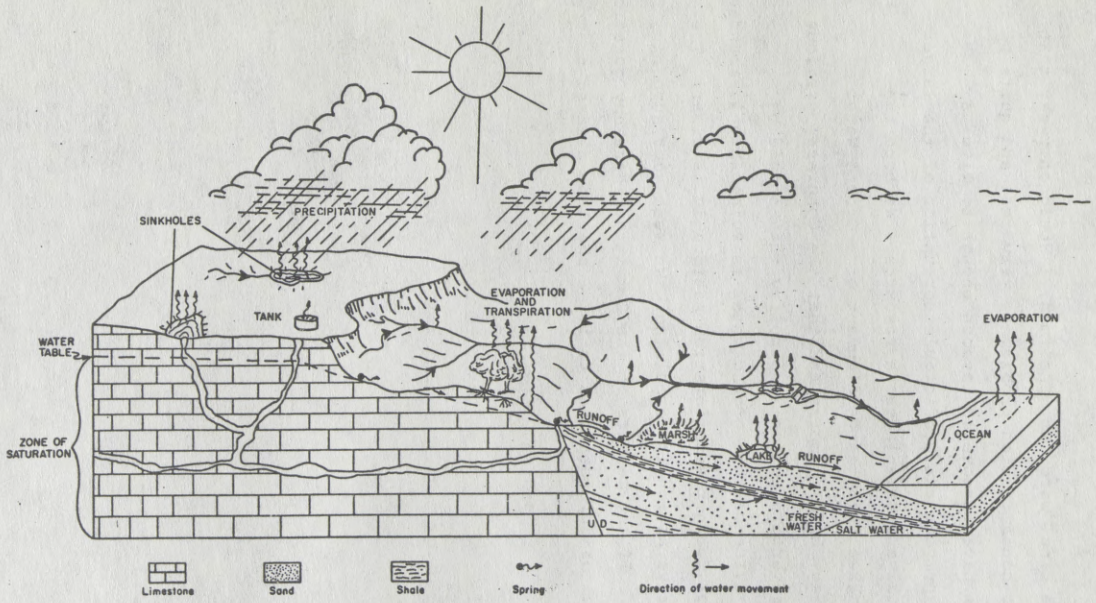
Meanwhile we are moving ahead to implement the hazardous wastes program under RCRA and the Underground Injection Control program under SDWA.

Wells used to inject hazardous waste are subject to regulation under both the RCRA and the SDWA. RCRA specifies that once a hazardous waste management program is in effect, hazardous waste may be disposed of only at a permitted facility. The SDWA states that an approvable State UIC Program must prohibit any injection which is not authorized under the UIC program. The UIC program will not go into effect until after the RCRA hazardous waste management program. Accordingly, if they are to continue operating, Class I and Class IV wells used to inject hazardous waste designated under RCRA must obtain interim status under RCRA and meet associated requirements. When the UIC program becomes effective, the injection well, below the well head, will be regulated under UIC program.

This will assure that these are no gaps in coverage under the two programs and that there is maximum protection of ground water from hazardous waste at the earliest possible moment.

CONCLUSION

By way of a final word, Mr. Chairman, I would only say that the ground water contamination problem is very real and quite serious. Yet we have discovered it soon enough to give us time to act, to prevent the predictable corruption of the larger part of that vital and irreplaceable resource. We hope the Committee will agree that the development of a Ground Water Protection Strategy holds promise and that the Congress' previous commitment to preventive action is a policy that should be continued. The evidence that ground water is vulnerable is abundant. The likelihood of further deterioration nationally is clear. The need for preventive action is compelling. We seek your support and your advice. If the members of the Committees have any questions about the problem or our responses to it, I shall be pleased to try to answer them.



Hydrologic Cycle

Texas Water Development Board in cooperation with the Crockett County Commissioners Court

SIA

SELECTED PRELIMINARY

COMPUTER PLOTS

OF

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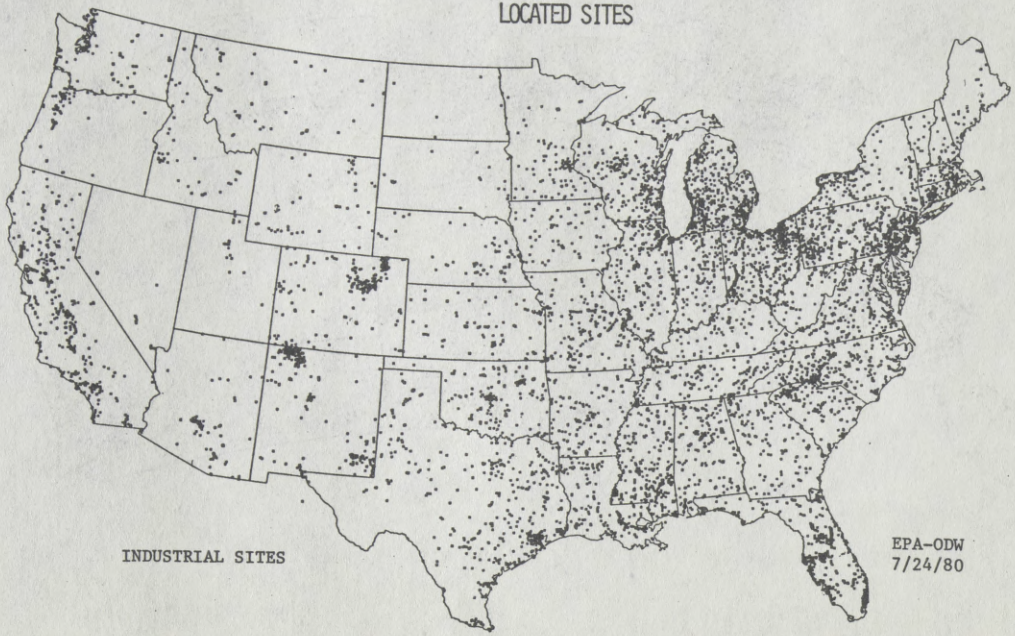

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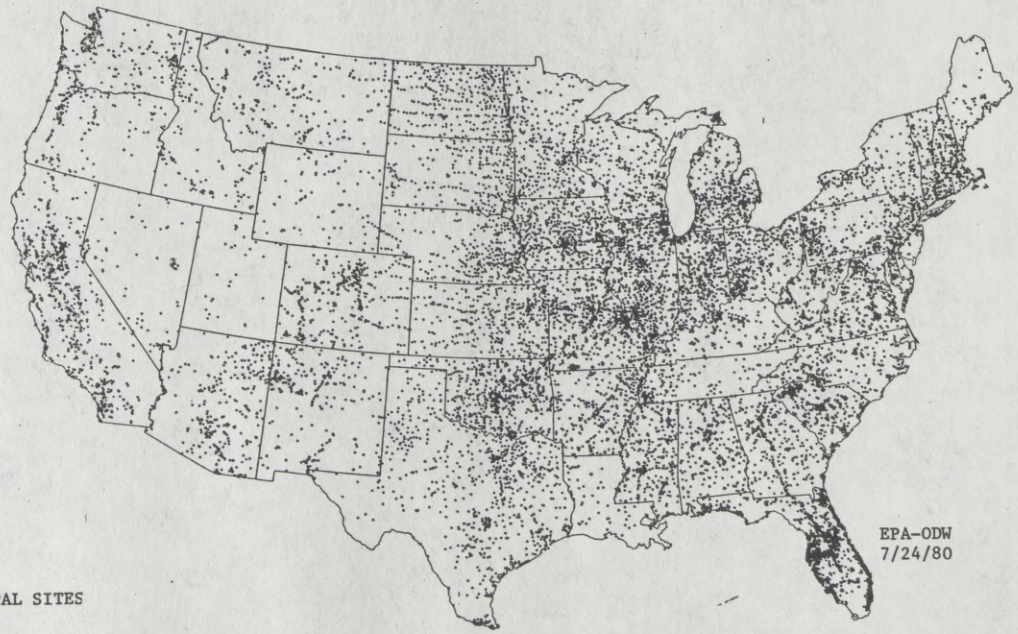

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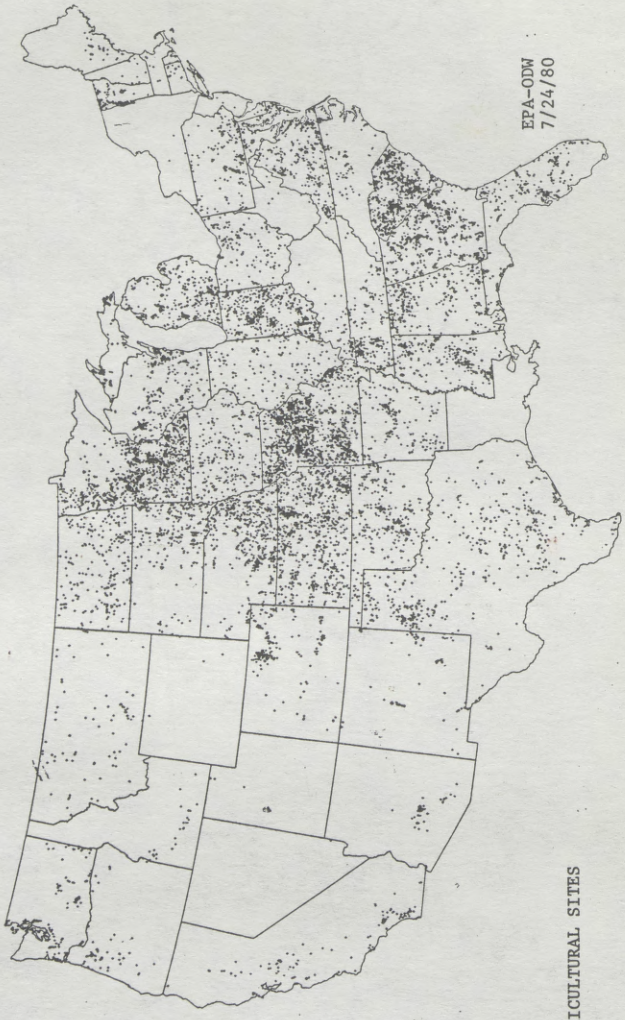
MUNICIPAL SITES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AGRICULTURAL SITES

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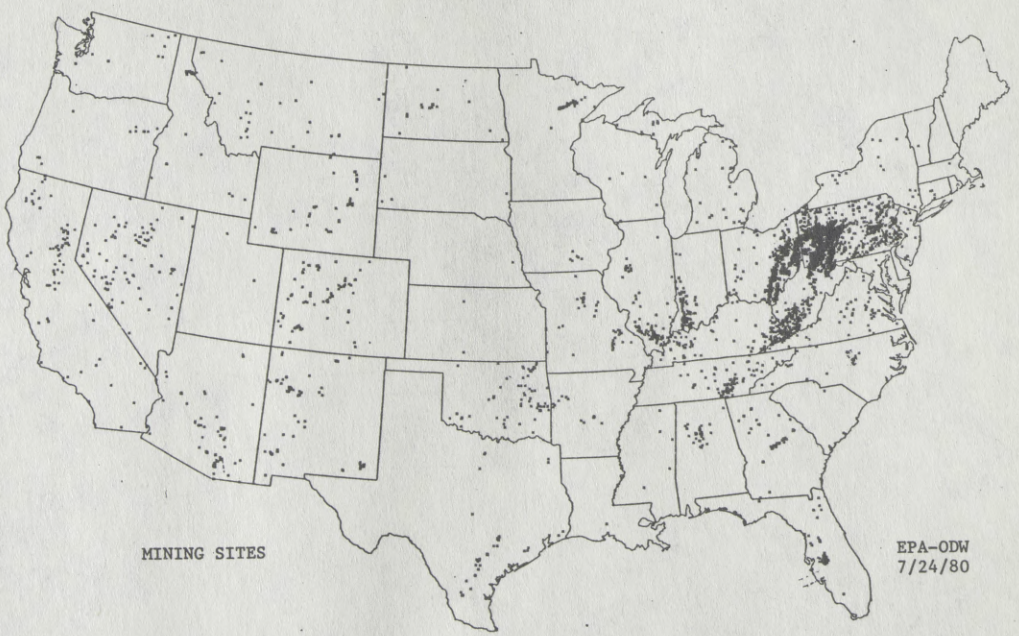

MINING SITES

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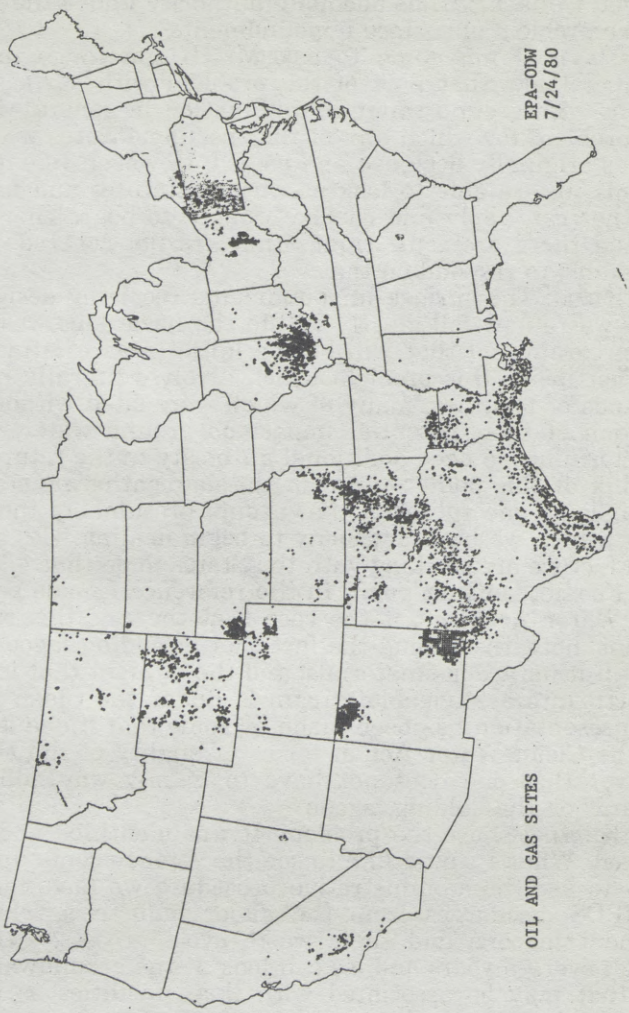
EPA-ODW
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OIL AND GAS SITES

Mr. WAXMAN. Thank you very much for your statement.

Do you think EPA has adequate authority under the law to deal with the problem of surface impoundments?

Mr. DAVIS. I am going to ask Mr. Kimm to go into that in general. I know that part of the problem with surface impoundment, as with ground water contamination in general, is that it is not a problem for which any of the specific statutes we have right now was originally designed and passed. However, like many of the problems we are able to look at various statutes and find parts of them that can apply and can be brought to bear. There are some gaps and there are some things that are not covered. Mr. Kimm may be able to respond on that.

Mr. KIMM. The surface impoundments receiving designated hazardous waste now fall clearly within the hazardous waste management program and that will be the initial area of attack. I think, as we get inside this problem which involves literally hundreds of thousands of facilities, many of which were sited without any consideration of their potential impact on ground water, we may in fact determine we need additional authority in the future.

I think at this point we are in the data-gathering stage and we have at least one subset of that group, presumably the most dangerous, which we have authority to begin dealing with right away, and in fact we are working with the States to do that.

Mr. FLORIO. On that point, in the reference I made before to the Clean Water Act, isn't it the case that there is this rather large gap that, notwithstanding the fact that a holding lagoon admittedly has in it hazardous materials, and the effluent that is ultimately put forth into a navigable stream is under the Clean Water Act, the representation has been made by some that if one is complying with the Clean Water Act in terms of quality of the effluent into the river that one does not have to in any way adhere to any standards on the holding lagoon?

Mr. KIMM. I share the problem. It was identified and it is being reviewed. What I would like to see the Agency come up with is an ability to use the administrative procedure we have for reviewing the NPDS discharges from the major industries, which include treatment lagoons and their waste cycle process. Permits come through every 5 years and we can look at the groundwater implications that may be associated with these facilities as part of the normal review process.

There is still some argument going on inside the Agency about whether we currently have adequate legal authority to do it, but it would be a very neat and cheap administrative mechanism to use to get a level of protection associated with those facilities very quickly.

Mr. FLORIO. We would like to get your most recent thinking on this because we are in conference right now on the Resource Recovery Act amendments and the so-called Swift amendment, dealing specifically with this point. We would like to have your latest thinking on that as we deal with the Senate.

Mr. DIETRICH. We believe that we have joint jurisdiction under both the Clean Water Act and RCRA over surface impoundments that contain hazardous waste, so we would intend with regard to those impoundments, to regulate them under the Resource Conser-

vation and Recovery Act. That will require these facilities to apply for a RCRA permit and obtain a RCRA permit and to comply with the interim status standards pending an issuance or denial of that permit.

Clearly the regulations that we promulgated in May of this year would provide joint jurisdiction of those facilities where they have hazardous waste in them.

Mr. WAXMAN. EPA has banned injection directly into aquifers but not above aquifers even though the same reason for banning one would seem to me to apply to the other. When do you expect EPA would prohibit the injection of hazardous waste above aquifers?

Mr. DAVIS. If I understand your question, one of the classes of that was set up under the injection program—I think it was Class IV—involved those wells that inject either into or above an aquifer. Those regulations were held up for a short period of time so they could be promulgated at the same time that the RCRA regulations are promulgated which can impact on the same sources, so those regulations would be consistent and not contradict one another.

Mr. KIMM. We would expect that they will come out together this fall as part of the regulations of the permanent facilities. It is a requirement for a permanent permit under a RCRA hazard waste management facility as well as this portion of the universe. For well injection, we have already established a prohibition of new ones and a 6-month phaseout of existing ones.

The heart of the problem here is that we have a need to carefully coordinate the requirements of RCRA and the requirements under the underground injection control program for wells that receive designated hazardous waste and we have done a great deal to insure—I believe we have succeeded, that the current regulations provide a very workable and fully integrated forum.

Mr. WAXMAN. Dr. Carter.

Mr. CARTER. Thank you, Mr. Chairman.

I hear a lot of talk about ground water and contamination from ground water this morning. What is the most common substance coming from ground water which is a contaminant?

Mr. KIMM. The monitoring that we have reviewed so far, which was described, would indicate that the six solvents are the most commonly found contaminants at the highest levels in water derived from ground water.

Mr. CARTER. What are these six solvents? Toluene is one, I believe, is it not? That is right. That is beside the point, you need not look it up. Toluene is one of them. He can include the other five for the record. I don't think any of us could quote verbatim what those happen to be, even Mr. Kimm, am I right?

Mr. KIMM. That is correct. I was going to read a list of the six that we have identified for this first group.

Mr. CARTER. Yes, sir.

From our soil water, we know that soil water contains certain acids. What is the reaction of this acid with chlorine?

Mr. KIMM. The interaction of humic acid and chlorine produces a family called trihalomethanes, which are carcinogens and are the most ubiquitous carcinogens we find in drinking water.

Mr. CARTER. Most common carcinogens are those which come from the union of the soil acids and the substance which we use to attempt to purify our water, which means that daily the 110 million people who drink this water, all of them are consuming carcinogens, is that correct?

Mr. KIMM. Generally; yes, sir.

Mr. CARTER. All right, sir.

You know, sometimes we point to other substances when actually we are doing things to ourselves which cause cancer. I don't know, I have consumed a goodly amount of this water, even in the Pacific during World War II, and yet I have been very fortunate not to have developed cancer.

With regard to the Delaney amendment, what should be the status of water which is purified using chlorine and yet is ground water containing soil acids. What should be the status of this water, if it is a carcinogen, given the Delaney amendment?

Mr. KIMM. The Delaney amendment prohibited the addition of additives to food that were shown to be carcinogenic. In the drinking water area, we see a higher level generally associated with water taken from surface supplies that have more humic acid in them than we typically find from ground water——

Mr. CARTER. Are we in spirit actually violating Delaney's laws by using——

Mr. KIMM. I think that the regulations associated with the Safe Drinking Water Act have a very specific requirement for balancing costs and feasibility. In just the area of public health protection, there is a very difficult problem we face when we set regulations for trihalomethanes because we did not want to preclude or interfere with adequate disinfection because waterborne diseases are a historically huge human killer around the world and they were in the United States at the turn of the century, so we had to balance——

Mr. CARTER. European countries are avoiding this at the present time. They have a method of taking this out of the water, is that not correct, trihalomethanes.

Mr. KIMM. Excuse me, sir.

Mr. CARTER. Is it true that West Germany has a method for taking trihalomethanes and chloroform out of the water?

Mr. KIMM. There are technologies——

Mr. CARTER. Sir?

Mr. KIMM. There are methods for removing these contaminants from water. What we are after, of course, is good treatment, adequate disinfection, and a minimum amount of unwanted byproducts.

Mr. CARTER. We ourselves are actually providing carcinogens for people to drink each day and that is a rather sad thing. We could, by using granular activated carbon, remove the trihalomethanes, is that correct?

Mr. KIMM. Granular activated carbon would reduce the level of trihalomethanes and many other organic contaminants in drinking water.

Mr. CARTER. Not only reduce, the Food, Drug and Cosmetic Act defines food as any food or beverage consumed by man or animal. The Delaney clause prohibits the addition of any carcinogen to any

food and I would think to any beverage, if we call water a beverage.

This is one of those things that happens and I don't think it is persuasive and a severe problem but we do have it.

What is the apparent level of trihalomethanes?

Mr. KIMM. One hundred micrograms per liter.

Mr. CARTER. One hundred micrograms per liter. Do you find this level exceeded in many cases throughout the country, particularly when our soil water is treated by chlorine?

Mr. KIMM. We made projections at the time that standard was established of the national impact. We certainly expected it to be exceeded. I think this is an area in which a great deal of scientific research has taken place. When the act was passed in 1975 we had no scientific basis on which to move toward regulating these unwanted byproducts associated with disinfection and we have now promulgated the standard and the monitoring is beginning to take place and over time I think we will find the levels of those unwanted materials being reduced.

We also see evidence of many other contaminants and we are trying to lower those particular contaminants to the degree that it is feasible to do so.

Mr. CARTER. What about the level of the trihalomethanes in the Ohio River above Cincinnati?

Mr. KIMM. The level in the river is not particularly high. The problem is that you have the precursors, so when you run river water through a water treatment plant, unless you do a very good job of getting precursor material out, you produce trihalomethanes as a side effect of your disinfection.

Mr. CARTER. With your humic acid and chlorine you would get a higher level of trimethylamine?

Mr. KIMM. Yes sir.

Mr. CARTER. And the same condition exists above Louisville or near Louisville on the Ohio, is that correct?

Mr. KIMM. Yes sir.

Mr. CARTER. Do you believe it appropriate that we focus our efforts only in those areas where there exist aquifers used for drinking water.

Mr. KIMM. I think the problem is so immense we merely agreed to set some priorities. This has all come out of discussions we have had with State and local officials and industry and environmental groups and I think in recognition of that, we are trying to concentrate our resources to protect the critical aquifers that are being used. I think it has been accepted by everyone, so I would agree with your comments.

Mr. CARTER. Are our drinking water supplies in and around Louisville, Ky., in danger of pollution from the Valley of the Drums?

Mr. KIMM. There is clearly some risk of that, yes sir.

Mr. CARTER. There is some risk of that. When the Safe Drinking Water Act was passed, through my amendment, $8 million, a small sum, was included for cleanup of such places as the Valley of the Drums.

I don't believe that money was appropriated.

Mr. KIMM. No, and that has led to the development of the Superfund thrust which now, of course, is a much larger fund but focused on a much greater perception of a national problem.

Mr. CARTER. I regret very much that the Appropriations Committee didn't see fit to authorize that money.

Mr. KIMM. I am sure everyone at EPA would agree with you.

Mr. CARTER. I regret that I didn't authorize more, but that is all I could get at that time.

Thank you, Mr. Chairman.

Mr. WAXMAN. Mr. Florio.

Mr. FLORIO. Thank you very much.

Mr. Davis, let me get my parochial question out of the way first, then we will deal with other things.

The Camden State Street Dump, a large old closed municipal dump that accepted hazardous materials, chemicals, for a long period of time, which is immediately adjacent to the Delaware River, which on the other side has drinking water wells for the city of Camden and which has already been closed because of contamination, largely TCE contamination.

This, as I have communicated to your office, is a dump that is constantly on fire as a result of methane that is produced, and everytime it goes on fire the fire companies go out and drench it with water, the result of which is that the chemicals leach down into the aquifer and continue to pollute the drinking water wells that are on the other side of the dump.

CMA, the Chemical Manufacturers Association, has made the offer in general to provide some technological assistance in order to review things of this sort to develop answers because it is clearly not an answer to keep putting water in and polluting the wells.

The State of New Jersey has a spill fund that they use to attempt to deal with problems of this sort, but the law provides that the responsible party—in this case the city of Camden—is required to reimburse the fund. The city of Camden is on the verge of bankruptcy and obviously is in no position to reimburse anybody for anything. Over and above that, nobody knows what to do to start with.

I have requested EPA to reach out to CMA and take them up on the offer. Can you give me any kind of report as to what it is that is being done in this direction?

Mr. DAVIS. Yes, Mr. Chairman. We are definitely going to, I think, be able to be of some help in this case. CMA's proposal or their general approach, which they had offered before, is one I have always been intrigued by. The chemical industry as represented by CMA in this case clearly has a body of expertise and knowledge probably unsurpassed by anyone in the country about certain aspects of these problems. The chemicals themselves, what kind of effect they might have, interactions they might have, and so on, are obviously areas they have an expertise in which we ought to be taking advantage of in dealing with these problems.

It is true, as you well know, that almost all of what we are able to do at this point is of an investigative nature, trying to determine what the problem is and how it could be solved. We don't have the funding, neither does Camden, neither does New Jersey, to solve

the problem, but we certainly can be working to take that first step.

I discussed this with people here in Washington, as well as the regional office and I am trying to initiate some discussion with CMA with regard to this, but I have outlined I think a short proposal which would include some tests the CMA team could carry out if they are interested and still some things that EPA would do as well and work with the State and city on it. I hope to have that back to you.

Mr. FLORIO. Hopefully the Superfund will provide us with the resources to implement whatever it is we decide to do.

You heard the first witness, Mr. Lent, and others talking about the inadequacies of the development of national standards that has taken place for some of the contaminants. Can you give us a report on what progress is being made in terms of if there are anywhere from 200 to 700 chemical contaminants we are finding in our water and there are only standards for a handful, you are going to have a State or even a local level of determination as to whether something is safe or unsafe. I do not think that is healthy.

Can you tell us how you are drawing priorities as to the establishment of these standards and what kind of progress you are making?

Mr. KIMM. Yes sir, we have discussed the matter in some detail with the oversight committee earlier this month. Let me try to sum up quickly. We began in 1975, when the act was passed, with a concern for organic contaminants in drinking water, looking at the two aspects of the problem. One of them was the unwanted byproducts of disinfection, about which there was little scientific data. A great deal of effort went into monitoring and basic scientific studies of health effects, treatment, and costs. This led to regulations which have been promulgated and which are now being litigated by the water works people.

A second area of concern was surface waters which tended to have large numbers of contaminants but at very low levels, and to that end we are considering application of granular activated carbon on those systems that are subject to that contamination.

In the last 1½ to 2 years, as we became increasingly aware of high concentrations of unwanted synthetic organic compounds associated with ground water, we have begun work on standards as required by statute. To set a standard we have to not only look at the health effects but we have to know something about its occurrence, naturally. We have to know something about treatment techniques. We have to know something about cost and economics, because we have a statutory responsibility to balance, if you will, health protection with feasibility. And in fact that is the focus of litigation that is currently underway on the THM standard.

Mr. FLORIO. I appreciate the balancing concept, but aren't there certain objectives, minimum levels of concentration below which there should be no permitting of these pollutants to be used for human consumption?

Mr. KIMM. What we have done is in the absence of being able to build standards which take a year in process after you have all the technological information together, is issue guidance on the health effect aspects. What we are most concerned about is providing

particularly State and local health officials with some idea of what data is available from the literature about what levels would pose serious health risk. Many of the State and local actions are in fact being drawn from health guidance information provided by our Agency.

In the short run, that is what we think we can do and that is what we have been doing and we are committing increasing resources to try and provide this technical assistance to State and local officials. The standards will come, but it is going to take a long period of time because of the number of hurdles we have to get through before we can in fact impose the standards.

In terms of our ground water, we have committed ourselves and expect to come forth this fall with a proposal for maximum contaminants levels, numerical standards, for six of the most frequently found solvents in ground water. The debate around those proposed regulations, I suspect, will be as heated as the debate that followed the last set of organic regulations proposed.

I am sure when we get through all that, we probably will be litigated again. The public debate will focus concern and will be a basis for moving forward. In the meantime, our principal reliance is on technical assistance and advisories in the health area, to help the State and local officials make determinations.

Our concern is for getting the high levels down.

Mr. FLORIO. Is it the case that the difference in the ground water versus the surface water standard, even though both are used for drinking water, is based upon the fact that much ground water drinking water is untreated, that is, wells, because it seems to me if in fact you are talking about ground water that is going to be treated and surface water that is going to be treated, there is no need for different standards. If you have got surface water drinking water standards, why wouldn't they be appropriate for ground water that is going to be treated as well?

Mr. KIMM. The health concern is the same. The worry about the adverse health effect is independent of whether it came from surface or ground supplies. The characteristics of the water that we are finding through monitoring are quite different. The surface waters tend to look like a soup: a little bit of tremendous amount of different things.

In the ground water area we are typically finding waters that are very high in a handful of recurring chemicals. The health concerns there are very serious. That is the reason we are moving to the six MCL as quickly as it is feasible to do so and have provided guidance for the first couple of dozen chemicals that have showed up in sampling in a number of States. So the health effect concern is independent of where it is derived from.

When you set a standard and you have to look at feasibility that gets a little touchier because you do have treatment costs and other statutory concerns to balance.

Mr. FLORIO. One of the supposedly strongest tools that you have to deal with in this whole problem of ground water contamination is sole source aquifer designation. To what degree have you used that and to what degree is there any validity to the argument that some make that that is an extremely radical device?

For example, in my State, the southern half of the State, most of the State owns an aquifer. If it were to be designated a sole source aquifer, the suggestion has been made no Federal appropriations would be able to take place and there would be a stifling of any economic development.

Mr. KIMM. I think the sole source aquifer device is a legislative vehicle that is a very useful tool and it has a role to play. It is not a panacea, it is not the solution. What it enables us to do is to designate certain critical aquifers and to guarantee that any new federally funded project in that area will take a serious look at its ground water impact. In many instances in the past facilities have been built with Federal assistance that have not looked at their ground water impact.

The act provides the Administrator with veto power over new Federal projects but in practice that is not what is happening. What is happening is we are using our ability to insure that environmental impact statements typically written for such major Federal assistance projects look at ground water impact. That is helpful.

Your second point is also correct, sir. That is, that it would be literally feasible to designate almost all of the United States as overlying some aquifer which is a significant source of drinking water to some portion of the population. Thus far about a dozen petitions have come in and about half of those have in fact been approved and designated.

Mr. FLORIO. My last point relates to a pet project of mine, waste oil. As a matter of fact, Mr. Dingell and myself will be holding a hearing within a few days on a waste oil piece of legislation and we are confident or hopeful we can have some legislation enacted in this session of Congress.

Waste oil was not designated by EPA as a hazardous material under RCRA, notwithstanding the fact waste oil is fairly acknowledged as having PCB and a lot of other very dangerous things. A substantial amount of this waste oil is just inappropriately dumped across the country.

Another substantial proportion of waste oil is used for road oiling, which obviously has potential for getting into ground water contamination.

Two questions: One, why hasn't EPA designated this admittedly hazardous material so it would fall under the purview of the RCRA regulations, and second, my understanding is that you are working on a program to deal with recyclable hazardous materials, and I would think that waste oil would be one. What is this program? What is this regulation scheme? What kind of progress are you making?

Mr. DIETRICH. Mr. Chairman, you are correct, we did not list waste oil. We intend to list it in the fall. Our reasons for——

Mr. FLORIO. You intend——

Mr. DIETRICH. We intend to list waste oil this fall in the phase II regulations.

Our reasons for not listing it in the spring were that we were not prepared to come out with management standards for waste oil. The reason for that is that the majority of the waste oil, in fact, is used or recycled—it is burned as a supplemental fuel, it is used as

a road oil, and it is also recycled or refined into a lubricating product.

Mr. FLORIO. Might I at this point say there is a dispute as to whether that is really recycling. I mean, waste oil on the roads that works its way into water supplies, I am not sure one agrees that is recycling in a useful way.

Likewise, the burning involves some substantial health problems as well. When at least Mr. Dingell and I talked about recycling, we are talking about recycling into usable oil that can be put into the process.

Mr. DIETRICH. I don't have any argument with that. We would not say that use of waste oil as a road oil or the use as a supplemental fuel is recycling. It is, however, a reuse. It is an action of doing something with waste oil which is not discarding the waste oil.

This is one of the more difficult issues we have had in the RCRA regulations—articulating that we in fact do have jurisdiction under the statute to regulate hazardous wastes that are not in fact discarded—that we have, in fact, the authority to regulate hazardous wastes that are used, reused, recycled, or reclaimed.

In our regulations in May we contended that we do have this jurisdiction and we intend to follow through on that jurisdiction with standards to deal with the use, reuse, recycling, and reclamation of hazardous wastes. One of the first hazardous wastes we will deal with, in this regard, is waste oil.

Mr. FLORIO. When is that? When will the regulations be published?

Mr. DIETRICH. We are expecting to do that in the fall of this year.

Mr. FLORIO. Talking a little more specifically about it, given an approximate date. It took us 4 years to get the first phase.

Mr. DIETRICH. I have had two people working on it all summer.

Mr. FLORIO. By the end of the year?

Mr. DIETRICH. By the end of the year. We are working very hard on that.

We would anticipate being able to regulate road oiling. We in fact may prohibit it. We anticipate regulating the burning of waste oil as a supplemental fuel. We might well prohibit some types of burning. Other types of burning that can be carried out in an environmentally safe fashion would be allowed if they comply with certain requirements.

We would hope to regulate the recycling or reclamation of waste oil in a way that would promote its recycling into lubricating products. Of course, we already have a standard and we would probably add to those standards for the discarding of waste oil—putting it in a landfill.

So in the fall we would have those types of standards and at that time, we would list waste oil.

Now, I would point out to the committee that, in part, waste oil is already listed. It is listed because one thing we know about waste oil is that it is typically mixed with other materials and oftentimes those other materials are listed hazardous waste. It is quite common, in fact, to have spent solvents mixed in the waste oil. Our regulations now read that any mixture that includes a listed haz-

ardous waste, including spent solvents, is a hazardous waste. So I contend that most waste oil today is covered as a hazardous waste.

It also is quite likely waste oil would be a hazardous waste by virtue of the extract procedure toxicity characteristic, by virtue of the lead that typically contaminates waste oil, particularly those waste oils that derive from automobile lubrication use where the lead is derived from the lead in gasolines.

Mr. FLORIO. Thank you, Mr. Chairman.

Mr. WAXMAN. Mr. Dannemeyer.

Mr. DANNEMEYER. Are there any States in the Union that are conducting a proper program to determine or control the adverse impact of hazardous wastes in the drinking water aquifers of their States?

Mr. DAVIS. Mr. Dannemeyer, there are a number of States that I think are in fact very good. I will ask Mr. Kimm to respond to that. But our experience has been there are several States that have been leaders, in some cases have been out setting standards well before EPA got on the scene.

Mr. KIMM. You have two different kinds of programs you are talking about. On the one hand you want a level of protection in terms of concern for the presence of synthetic organic chemicals in drinking water. At the same time, you want to go after the most likely causes of those problems, take preventive measures, and begin to get the disposal of hazardous wastes under control. A number of States have active programs in both areas.

California, for example, is a State that has had an active program in the solid waste area and a very aggressive drinking water program for many years.

Mr. DANNEMEYER. How many States in the Union, would you say, are conducting, in your assessment, a proper program for protecting the citizens of those States from the hazards you are talking about?

Mr. KIMM. I don't have a specific number along that line. I think that there are a handful of States that have had active programs in both sides for many years but you would have to define—I am not sure how I would precisely define adequate programs. There is a great deal of monitoring and concern going on in regard to contaminated ground water reaching drinking water sources. Each time an event is found, an incident of contamination is found, it kicks off a very serious and difficult to manage problem of controlling that contamination. That is going on all over the country at greater or lower levels.

What we are moving toward is clear standards and requirements and that way we can in fact get the States up to an equivalent level of performance, but there are many States that have had an aggressive program in one area or another for many years.

Mr. DANNEMEYER. I was interested in the observation by the gentleman on the end.

Mr. DIETRICH. Gary Dietrich.

Mr. DANNEMEYER. I think you were the one that mentioned a procedure where waste would comply with the Clean Water Act, but there was some suggestion there was some other act that they could not comply with, and you felt you could require them to procure a permit, is that right?

Mr. DIETRICH. This would be surface impoundments that are treating waste waters that are hazardous wastes. That would come under both the jurisdiction of the Resources Conservation and Recovery Act as well as the jurisdiction of the Clean Water Act. They would have to have an NPDES permit for the discharge from these impoundments into surface waters. They also would have to have an RCRA permit for the operation of that treatment facility. The RCRA permit would deal with matters of the leaching of hazardous wastes through the bottom of that impoundment. The NPDES permit under the Clean Water Act would deal with protecting the surface water from discharges from the treatment facility. So there is dual jurisdiction for those types of facilities.

Mr. DANNEMEYER. I am bothered a little bit by all of this, and I think we are all bothered by the overabundance of regulations. If a citizen or a business or a company complies with one provision of the act, policywise, is there a purpose being served by requiring them yet to conform to some other act for some other purpose? Isn't one act enough?

Mr. DIETRICH. The Clean Water Act and NPDES permit provisions do not provide any protection against leaching into the ground water; they only regulate the facility with regard to the quality of effluent that is discharged as a point of source into surface waters. So we are not in any way duplicating what is done in the Clean Water Act. Instead, we are adding additional provisions on top of those of the NPDES program.

As has been suggested here today, I believe by the chairman, we have recognized unfortunately that a lot of the treatment impoundments that have been used to comply with the Clean Water Act allows leakage of wastes out of the bottom of the impoundment and also occasionally allow emissions of toxic material into the air. The Clean Air Act does not now deal with the air emissions from these facilities and the Clean Water Act only deals with the discharge of pollutants into surface waters. Therefore, we are using the Resources Conservation and Recovery Act to add requirements on top of those, not to duplicate any requirements of the NPDES program under the Clean Water Act.

Mr. DANNEMEYER. Thank you, Mr. Chairman.

Mr. WAXMAN. Mr. Walgren.

Mr. LUKEN. About the previous testimony, I don't recognize the term "Clean Water Act." Is it Federal water pollution control?

Mr. KIMM. Yes, sir.

Mr. WALGREN. I do not have a line of questioning to pursue, I just want to underscore how valuable I think the interest of both committees that you and Mr. Florio chair is in this problem. And to express my appreciation particularly, Mr. Chairman, for your bringing the Health Subcommittee to Pittsburgh to look at the relationship with hazardous waste and drinking water supplies and, second, to underscore what is implicit in the testimony that has been given here, and that is the great reliance and assumption by the public that the powers that be, whichever level they come on, which will assure safe drinking water and, second, the surprise that most new people, when they look at the relationship between hazardous waste and drinking water, find with our lack of foresight in protecting drinking water supplies. I know if you took the aver-

age person in Pittsburgh and myself, prior to 1 year ago, and told them that the major source of drinking water for literally hundreds of thousands of people is within 100 yards of a major chemical system in Pittsburgh, including lagoons that virtually overspill and have spread chemicals widely, and that that same source is within certainly 300 yards of a hazardous waste dump that was essentially overlooked so much so that we went ahead and built a park on that land, complete with picnic tables and light stanchions and lines drawn on the new asphalt to show people where to park the car, and that park is now sitting there like it was hit with a neutron bomb because it is absolutely contaminated with hazardous wastes that are fatal to small children—now, the officials in Pittsburgh were not insensitive and they were not willfully looking the other way, we just did not have the kind of foresight that would prevent this kind of problem from arising. The problem is very severe and I would like to compliment EPA on its effort in the area. Thank you, Mr. Chairman.

Mr. WAXMAN. Mr. Luken, do you want to proceed?

Mr. LUKEN. Yes; I can take care of anything I have in just a moment, Mr. Chairman.

Mr. WAXMAN. Go ahead.

Mr. LUKEN. I am glad that Mr. Florio is here. Just for my own education here, your description of the Superfund here, describes one of the versions of the Superfund. I assume, for example, you are describing it as including joint, several, and strict liability on those who cause or are causing the problem. We did not exactly get that out of your committee bill, did we, Mr. Florio?

Mr. FLORIO. I will be happy to respond. Yes; we did with regard to——

Mr. LUKEN. Strict liability?

Mr. FLORIO. The ability to seek reimbursement.

I think the gentleman might be just confusing the two concepts. One is an independent action by a third party that was not obtained out of H.R. 7020, although it was discussed. The ability of the fund to seek reimbursement from a wrongdoer does provide the ability of the fund together in accordance with that standard you made reference to.

Mr. LUKEN. Thank you, I think I will waive any other concerns I have at this time.

Mr. WAXMAN. Thank you very much. I do not know if our colleague Mr. Gramm was planning to come back and ask any questions or not. If you might just wait a few minutes. We are going to respond to a vote on the House floor and return, and if Mr. Gramm does have questions I want to give him an opportunity to ask them.

[Brief recess.]

Mr. FLORIO [presiding]. The committee will reconvene. Mr. Waxman has been delayed on a matter. He has asked me to go forward with the witnesses. Thank you very much.

Mr. DAVIS. I wanted to add one brief comment, if you do not mind. It is in regard to a question that was asked earlier about the status of State programs and their effectiveness. I wanted to make sure we did not leave the impression that somehow we are convinced at this point that this problem is totally under control and

being addressed by State and local government. Certainly they are playing a major role at this point. Many of them are out in front in playing a leadership role in this problem, but the fact still remains that there is clearly a lot to be done. Many States do not have effective programs, do not have resources for these programs. Those that have programs in some cases do not address many of the pollutants we are concerned about or sources we are concerned about. I think the real test as the old axiom goes, is in the taste of the pudding itself, and if you look across the country at these hundreds if not thousands of drinking water wells that are being closed down, other problems are showing up. The evidence speaks for itself in that there is still a lot to be done. We are hoping what we can do is not going to duplicate the State effort but to complement and make them partners along with us in this effort.

Mr. FLORIO. Gentlemen, thank you very much.

Mr. STROHBEHN. Thank you.

Mr. FLORIO. Our next witness—we have a panel of three—I understand Mr. Schiffman has an obligation so we are going to have him come forward and ask him to testify first. Mr. Arnold Schiffman, director for Division of Water Resources, New Jersey Department of Environmental Protection, Trenton, N.J., Mr. Harry Borchers, executive manager, North Penn Water Authority, Lansdale, Pa., and Mr. Walter Hang of the New York Public Interest Research Group, New York, N.Y.

Please introduce yourselves. I note that you have some slides, which is somewhat unusual, but the slide time is coming out of your testimony.

STATEMENTS OF ARNOLD SCHIFFMAN, DIRECTOR, DIVISION OF WATER RESOURCES, NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION; WALTER HANG, STAFF SCIENTIST, NEW YORK PUBLIC INTEREST RESEARCH GROUP, INC., ACCOMPANIED BY SHERRY OSTER AND DONNA TROCCOLI, MEMBERS, DUMP THE DUMP, LONG ISLAND CITIZENS GROUP; AND HARRY J. BORCHERS, JR., EXECUTIVE MANAGER, NORTH PENN WATER AUTHORITY

Mr. SCHIFFMAN. My name is Arnold Schiffman and I am director of the Division of Water Resources, an agency of the New Jersey Department of Environmental Protection. I wish to thank you, Chairman Florio, for the opportunity to speak to the committees on ground water pollution problems in New Jersey.

Ground water is the major source of water in New Jersey. We pump over one-half billion gallons of water from aquifers each day. Although not a very large amount compared to many Western States, New Jersey ranks seventh among all States in terms of gallons pumped per square mile. In other words, the population density is high.

On the other hand, I believe that New Jersey's ground water pollution problems are among the worst in the Nation. Based on reported problems alone, without a formal program to seek out pollution, we have already closed 13 public water supply wells with a combined capacity of 9 million gallons per day. Approximately 500 individual household wells have also been closed. The reasons range from pollution by commonplace substances such as salt and

gasoline to exotic organic chemicals. It is perhaps an unfortunate sign of the times that nearly all of these well closings were because of hazardous chemicals.

For the past several years we have been keeping an index of documented cases of ground water pollution. I want to emphasize documented because where there is some piece of information of an occurrence. As of June 30, 1980, we have recorded 129 accidental spills, 20 cases of illegal dumping, 97 cases of pollution from industrial facilities, 17 cases of ground water pollution traced to sanitary landfills and 3 cases from septic systems that possibly were the cause of water borne disease. This is a running count. We keep updating it periodically. I must emphasize that this report, and for that matter, the entire ground water program in New Jersey is the work of only a handful of people and represents only the tip of the ground water pollution iceberg. These resource limitations are, I believe, representative of most other States. I would like to give you a visual impact of what some of the problems we have are. I believe by now that most people have heard of Jackson Township, N.J. It has been on TV. It has gotten nationwide attention. There has been testimony before congressional committees. I want to show you a picture of what it looks like. That is the white area in the lower left-hand corner is the landfill area. The houses are around the landfill. You cannot see anything. It does not look like anything. It looks like a bunch of clean sand, which is what it is. The area was mined out for a titanium material. Then this clean washed sand material was put back down. What happened is they dumped liquid industrial waste here. It percolated right down.

This is another landfill. I do not have the pictures of them dumping at Jackson. This is what it would have looked like. Chemical material percolating right down contaminating wells in the area. No surface expression as you saw from the aerial view of the pollution. No trace of contamination at the land surface; 160 wells were contaminated, over $1 million was spent to bring in alternative water supplies.

I have other visual impacts.

You will see in the background there is a foundation of a new home. There is a person standing over a stream of chemical leachate that comes from a landfill that you cannot see in the background, chemical leachate flowing right past foundations for new homes. That is one visual impact.

Let me give you another visual impact. Here is a water truck with drinking water for homeowners. This is the same place where they had the leachate running across the house foundations.

This is another type of visual impact.

The sources and causes of ground water pollution are many. Recently, there was a nationwide effort to assess the impact of surface impoundments—pit, ponds, lagoons—on ground water. Our study in New Jersey shows that most of these impoundments leak and pollute ground water. Many of these impoundments are part of the technology required by the Clean Water Act. They serve to settle out solids suspended in waste flows before discharge to a stream. Not all of them are related to clean up to meet discharge requirements for streams. Some of them are just pits on the property.

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Impoundment also serves as a way to discharge waste water in a manner that does not fall under the purview of the Clean Water Act. Here is an unlined impoundment with industrial waste constructed in clean sand where the waste percolated down. It was designed to do this.

It is in an area where there are no nearby streams. This is a way not to come under the requirements of the Clean Water Act.

This is an aerial view of the land fill. Those black fingers are lagoons for septic tank waste that is pumped out of septic tanks. They put the septic waste in lagoons and it percolates down into the ground water. The lagoons are kind of handy, they never fill up.

I have shown you an example of how pollution control laws have caused waste to move to the place of least regulation, the land and the ground water. Now there are people who put in lagoons and ponds to try to do the job right. Here is a liner, one that has a hole in the corner and it leaks. That is a problem. Pits are not only used for liquid waste, here we see dumping of sludges into a trench that is just sand. It rains and the material that is in the sludge seeps out and pollutes the ground water.

Many sources of ground water pollution are common activities. Some of them are everyday type things.

This is a salt pile of road salt to keep the ice off the highways in the winter. It rains, it leaches, percolates into the ground and pollutes ground water. This is an underground pipeline that broke, oil, petroleum products leak out and percolate into the ground water and pollute it.

Here is a problem, one of the most common causes of all, buried tanks. They happen to be gasoline tanks. They rot, they corrode, they leak. These have been pulled out of the ground and replaced.

You can go to any hardware store and get these solvents, such as trichloroethylene. Not only that, there is a common ingredient in septic tank cleaning, a very common material. We have been finding this a lot in the ground water.

I would like to emphasize that ground water and surface water are not two distinct water resources. The ground water is the source of water for streams when it does not rain. If you pollute the ground water you pollute the streams.

Let me show you a couple of examples. Oily waste was dumped into a gravel pit. This is a marshy low area. The oil seeped down into the gravel pit, entered the ground water, traveled to a low area, which is a marsh and stream, and came out in the marsh and the stream.

That red area going into the clean stream is industrial waste. It was dumped into a mine, percolated down into the ground water and out into the stream.

If you pollute the ground water, especially our surface aquifers, you pollute the streams.

Mr. FLORIO. Is it not also the case it can work the other way? It is my understanding with regard to the Camden drinking water system, because of extensive development east of Camden, that that aquifer is being pulled upon and as a result of the pull from the one direction, that the Delaware River is working its way into the aquifer and working its way into the drinking water wells?

Mr. SCHIFFMAN. That is correct, and in many places you pollute the streams, we have wells nearby, you pollute the ground water. It works both ways.

Now some potential ground water pollution threats are unusual and cause minor damage. This is a large tank of molasses that broke and spilled onto the ground. The amount of ground water contamination was not serious but we have some unusual source of ground water pollution that did destroy water supplies. These are pickle barrels. You can see some of the seepage as they leaked, percolated into the ground in New Jersey, and knocked out a bunch of wells.

Just in case anybody thinks I picked something unusual, here is the same kind of thing, pickle barrels in Maryland that leaked, polluted wells.

Now, the reason I showed this is that whether the ground water is polluted by pickle juice or it is polluted by some exotic organic chemical such as "dimethyl meatloaf." which is my generic term for the over 6 million chemical compounds we have, the aquifer is still taken out of service and destroyed. The only difference is I doubt if anybody would suffer too much of a health effect from drinking ground water contaminated by pickle juice as against an organic chemical. But the point is the wells are still destroyed.

I have shown you the dark side of ground water pollution. There are also positive aspects. Clean up and correction of the damage.

Although contamination of ground water is difficult to correct, it can be done.

We have cleaned up some ground water in New Jersey, but the cleanup is not as visible as the pollution. The lagoon I showed with the hole in it is now a concrete basin. This was not cheap to do.

I can also show you attempts to correct ground water pollution by installing interceptor trenches at a landfill. This is the same one I showed you before. It can be done, this is not cheap either, and it is tough to do but you can do it. We have cleaned up in one case ground water contaminated by gasoline by introducing bacteria into the ground that ate up the gasoline. We have cleaned up ground water polluted by organic solvents by pumping the contaminated ground water out to remove the chemicals and recharging the clean water back into the aquifer.

In total, we have 16 active ground water decontamination projects in New Jersey. We have also initiated a major effort to cleanup toxic waste dumps at great expense, and we are also implementing new State laws and regulations to prevent pollution.

I would like to make one thing clear. The cleanup is not a common type activity in this country. We are doing it in New Jersey because we have to. We have a large population, and a small land area. I just want to emphasize that these things are not too common in the rest of the country. We are looked upon as leaders in some of these things. They are not cheap. I have one case alone where $2 million was spent to clean up a small area. The company well was contaminated along with a town well in this particular case. It happened to be one of our larger corporations. They actually got extremely interested in the problem. That is the exception, not the rule. We know our resources are inadequate for the task and we know our efforts to date have barely scratched the

surface of ground water pollution problems but we are doing what we have to do.

Current Federal legislation dealing with ground water pollution is aimed at either a specific mechanism such as injection wells under the Safe Drinking Water Act or a specific class of substances such as hazardous wastes under the Resource Conservation and Recovery Act. As I have shown you, there are many causes of ground water pollution that have nothing to do with well injection and sources of ground water pollution that are not hazardous wastes.

Many State laws for controlling ground water pollution deal with discharges to ground water in much the same way Federal laws deal with pollutant discharges to streams and to the atmosphere. This is both the proper legal method and level of government to deal with ground water pollution. I would urge that Federal programs to deal with ground water pollution emphasize the predominant role of the States, and provide the necessary dollar resources for doing the job.

I would also like to make one little closing statement.

My job, I am on the firing line, I am a director of the Water Resource Agency, I am the one who gets the call, I am the one who closes the well, I am the one who knocks on the door to take the water samples and triggers the obvious questions as to why I am doing it. I cannot do it by myself, frankly. Our State resources are limited in New Jersey.

I can use a little help. I need more dollars, resources, to do the job. The Superfund is one answer and I would appreciate anything that Congress does in this area. Thank you. I would be happy to answer any questions.

Mr. FLORIO. In light of your time, let me ask you one or two questions.

With regard to the remedial actions that you have talked about, for the most part they were preventative to stop further contamination from going forward. The Jackson Township site is a bad situation. We are now apparently in that area pumping in water through a system from somewhere else.

What is the prospect of ever cleaning up the water supply, the native basic ground water supply system in Jackson Township? Do we have the technology? Has research been done to ultimately purge an aquifer in some cost-effective way?

Mr. SCHIFFMAN. In some areas we can do it. In Jackson Township the natural system, the ground water system was modified by an operation which then eliminated all of the natural barriers to contamination and when they dumped the waste it went down. The chances of remedy at Jackson are poor although possibly technically feasible. A lot of other places there are different circumstances. I do not have any feel for that right now. All I can say is that the conventional wisdom was that ground water cannot be cleaned up. In New Jersey we have shown it can be cleaned up, though at great expense in certain cases. The cases are limited right now.

Mr. FLORIO. Let me ask you two specific questions. Price's Pit is a dump near Pleasantville, N.J. immediately adjacent to Atlantic City. It has been represented to me that this particular site may

very well have an adverse effect upon the water supply of Atlantic City

Is this something that has been brought to your attention?

Mr. SCHIFFMAN. Yes, sir, we are aware of this. It is a very difficult situation at that particular area. Benzene is one of the contaminants that we found could go through clays to a deeper aquifer system, it looks like it is contaminated by this material.

Mr. FLORIO. This aquifer system is contaminated by benzene, you say?

Mr. SCHIFFMAN. That is what it looks like.

Mr. FLORIO. This is the source of water supply of that area?

Mr. SCHIFFMAN. Yes, sir, it is a distance away right now. The evaluation has not been done. We plan on doing it. In ground water it is very difficult to get the information as compared to a stream. A stream, you go with the plastic container and dip it and take a sample out. In the case of ground water you need a $30,000 drill rig to drill a hole to get the sample. We are obtaining that type of equipment, but we have so many cases, it is going to be a long hard pull until we get out of the problems we have gotten ourselves into.

Mr. FLORIO. Based upon our previous conversation with regard to the problems in the city of Camden, with regard to what you are saying about Atlantic City, is it fair to say that New Jersey, being so dependent upon ground water for its drinking water supplies, is on the verge of a water crisis, unless there are some rather drastic actions taken, if in fact those actions can be taken?

Mr. SCHIFFMAN. Yes. I hesitated a second but the answer is an unqualified yes, our surface water resources are also stretched. The ground water, which is more than half our water supply in terms of new supplies, is our ace in the hole and it is subject to question right now as far as its integrity goes.

Mr. FLORIO. There is an area in my district where wells have been closed as a result of nitrates found in the water at higher levels than are acceptable and the suggestion has been made to me that as a result of septic tanks, and that in the southern half of the State, in many communities, where there is a use of septic tanks, that septic tanks are the source of ground water contamination.

Have you found this to be a problem?

Mr. SCHIFFMAN. The nitrate problem is a very difficult one. The major difficulty is that nitrate, under the Safe Drinking Water Act, is the same type of contaminant as arsenic or cyanide. Nitrate is also so common that we simply cannot call it a hazardous waste because then we would be manifesting under the RCRA Act a load of horse manure and we have great difficulty in this area. But a well contaminated by nitrate that does not meet drinking water standards is just as much a problem as wells contaminated by trichloroethylene, that is serious. In the case of septic tanks, nitrate is a big problem. The full extent is not well known.

[Testimony resumes on p. 118.]

[Attachment to Mr. Schiffman's prepared statement follows:]

STATE OF NEW JERSEY GROUND-WATER POLLUTION INDEX

1975 to June, 1980

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WATER RESOURCES

BUREAU OF GROUND-WATER MANAGEMENT

see map for locations

status of cases in bureau files

GLOSSARY

FORMATION ABBREVIATIONS:

Tbh = Beacon Hill Gravel
Tch = Cohansey Sand
Tkw = Kirkwood Sand
Tsr = Shark River Marl
Tmq = Manasquan Marl
Tvt = Vincentown Sand
Tht = Hornerstown Marl
Krb = Red Bank and Tinton Sands
Kns = Navesink
Kmw = Mount Laurel and Wenonah Sands
Kmt = Marshalltown Formation
Ket = Englishtown Sand
Kwb = Woodbury Clay
Kmv = Merchantville Clay
Kmr = Magothy and Raritan Formations
Trb = Brunswick Formation
Trl = Lockatong Formation
Trs = Stockton Formation
Dsk = Skunnemunk Conglomerate
Dbp = Bellevale Sandstone and Pequanac Shale
Kmo = Marcellus Shale and Onondaga Limestone
Dkn = Kanouse Sandstone
Des = Esopus Grit
Dob = Oriskany and Becraft Limestones
Dnc = New Scotland, Stormville and Coeymans Formations
Sbd = Late Silurian Formations
Shf = High Falls Formation
Ssg = Shawangunk Conglomerate
Sd = Decker Limestone and Longwood Shale
Sgp = Green Pond Conglomerate
Omb = Martinsburg Shale
Oms = Manhattan Schist
Ojb = Jaclsonburg Limestone
Cok = Kittatinny Limestone
Oe = Epler Formation
Or = Rickenback Dolomite
Ca = Allentown Formation
Cl = Leithsville Formation
Ch = Hardyston Sandstone
Fl = Franklin Limestone
Trbs= Basalt Flows
Trdb- Diabase
sp = Serpentine
ns = Nephelite Syenite
bb = Basic Volcanic Breccia
gr = Granite
gb = Gabbro
lgn = Losee Gneiss
bgn = Byram Gneiss
wgn = Wissuhickon Mica Gneiss
pgn = Pochuck Gneiss
Fnd = Formation not determined
Qs = Quaternary Sands

FORMATION ABBREVIATIONS:

Qm = Moraine
Qtm = Terminal Moraines of the last (Wisconsin) glacial epoch
Qrm = Recessional Moraine (Wisconsin)
Qsd = Stratified Drift (Wisconsin)
Qed = Early Drift (Wisconsin)
Qbs = Beach Sand and Gravel
Qcm = Cape May Formation
Qrd = River Drift
Qps = Pennsauken Formation
Qbt = Bridgeton
Qal = Alluvium
msk = Skarn
Rec = Recent
pC = Pre-Cambrian

TECHNICAL ABBREVIATIONS:

Ag = Silver
Al = Aluminum
As = Arsenic
Ba = Barium
BOD = Biological Oxygen Demand
Ca = Calcium
Cd = Cadmium
Cl = Chloride
CN = Cyanide
COD = Chemical Oxygen Demand
Cr_{+6} = Chromium
Cr^{+6} = Chromium (hexavalent)
Cu = Copper
DO = Dissolved Oxygen
F = Flouride
Fe = Iron
K = Potassium
Mg = Magnesium
mg/l = milligrams per liter
Mn = Manganese
Na = Sodium
Ni = Nickel
NO_3 = Nitrate
Ph = Lead
PBB = Polybrominated biphenyl
PCB = Polychlorinated biphenyl
ppm = parts per million
Se = Selenium
Si = Silica
SO_4 = Sulfate
TDS = Total Dissolved Solids
Zn = Zinc

Accidental (A)

A-1 Gulf, Port Monmouth, Monmouth Co., 7/14/76:
Approximately 3500 gallons of gasoline in ground water. Recovered 2000 gallons from tank area and 1000 gallons from production well. Cleanup finished on 11/8/76.
Qs/Rec/Ket

A-2 Exxon, Millville, Cumberland Co., Early Spring '76:
Approximately 8000 gallons of gasoline were reported to be in the groundwater. Recovered 10,500 gallons. Public supply well 500 ft. away was closed and Exxon used bacterial activation to remove remaining gas, case closed. Qbt/Tch

A-3 Arco, Duck Island, Trenton, Mercer Co., 11/30/76:
Approximately 2500 gallons of ARCO supreme was spilled due to overfill from pipeline. Cleanup was by excavation of 250 cubic yds. of soil. Several wells were installed. Area is underlain by peat, case closed Qs/Rec/Kmr

A-4 Dover Sewer Authority, Lavalette, Dover Twp., 11/3/76:
Approximately 3000 gallons of diesel oil was spilled into the ground water. Well at site removed several hundred gallons, and flooding was used to remove the rest, case closed
Rec/Qcm/Tch

A-5 Wanaque-Midvale School, Passaic Co., Spring '76:
Unknown amount of fuel oil leaked from underground tank and appeared in stream approximately 200 ft. away. Investigation and Cleanup is still continuing in spring 1980 due to renewed leakage. Large volume oil involved. Qm/Qs/pC

A-6 Ingersol Rand, Philipsburg, Warren Co., Late fall '75
Approximately 45,000 gallons of fuel oil lost in 1945. Oil was then found in a new well on the site, 500-800 ft. from spill site; No recovery. New well fouled.
Or-Cavernous Ls.

A-7 Old Deal Rd., Eatontown, Monmouth Co., Fall '76
Well contaminated with organic chemicals, TCE. Investigation revealed people contaminated their own well. Used a 1 lb can of "spray and wash" per week for 52 weeks. Well closed. Home connected to public water supply. Case closed.
Tvt

A-8 West Shore Lake Hopatcong, Sussex Co., 2/24/76
Wells contaminated on Adelphi drive. High TDS, Si, Mn, Fe, Cl. Pollution source suspected to be Septic systems and iron smelting slag. Pc gneiss

A-9 Agway, Flemington Junction, Hunterdon, 2/24/77
Area of many petroleum product spills. Four wells are contaminated; deepest are 170'. No cleanup underway.
TRb

A-10 Hess Oil, Lakewood, Ocean Co., 3/10/77
Leaking tank; gasoline showing up in telephone manhole (Exxon-1000 gallons by 3/21/77). Borings by Exxon indicate traces of gasoline around Exxon station and to the Southeast. Borings North and in front of the Hess station indicate Hess is the source of the gasoline. 18,000± gallons of gas removed, case closed. Tkw

A-11 South Orange Water Department, South Orange, Essex Co., 3/77
Gasoline in ground water. There were 26 possible sources and entire South Well Field had a gasoline taste and odor. Well field shut down. All sources pressure tested and some drilled. Most severely contaminated wells pumped to waste for 2 1/2 years. Well field returned to service in July 1979. TRb

A-12 Hess Oil, Middletown, Monmouth Co., 3/29/77
Hess gasoline station on Rt. 35. 4400 gallons of gasoline unaccounted for over a two day (3/29-30/77) period. Recovered 7100 gallons by recovery wells. Case is now closed. Kmv

A-13 Private wells, Manahawkin, Ocean Co., 4/18/77
Oil, grease, and volatile organics found in wells. It appears as though any leaks or spills in the area of Meenan Oil Co. or Forte Oil storage would flow towards the dewatering wells (see file for locations) and thus across the private wells having the contamination problems. The dewatering operation has been stopped and the water quality has gradually improved. Problem appeared to be caused by excessive dewatering (lowering ground water level too much). Wells were ordered closed on or after 5/5/77. Qcm/Tch

A-14 (Rubin Home), Franklin Twp., Somerset Co., 5/76
A domestic well was contaminated with what appears to be sewerage plus hydrocarbons(gasoline?). Well should be abandoned since they have city water. Case closed. TRb

A-15 (Maschio's Restaurant), Lyndhurst, Bergen Co., 6/77
Contaminated well used by Maschio's for air conditioning. Gasoline or Diesel fuel present in well. TRb

A-16 Mrs. Horman; Arrighi Drive, Warren Twp., Somerset Co.,
Contaminated domestic well with a strong odor presumably fuel oil. There were three possible sources; 1) home fuel tank 2) 1000 gallon fuel oil spill in 1976 3) buried gas tank 500 ft. away. TRbs

A-17 Harding Twp., Morris Co., 9/77
2-6,000 gallons leaked from a Sunoco (Mohawk Oil Co.) gas station on Rte. 202. Four domestic wells contain significant amounts of gasoline. Recovery effort underway as of 10/11/77 from two recovery wells. Recovery totalled several 100 gallons only. A new 500 foot well was drilled for the most affected supplies monitor wells are bailed periodically. Case settled out of Court. (see file for location). TRb

A-18 Mt. Arlington wells, Morris Co., 7/77
Contamination of several private wells by a gasoline spill at Exxon station in 1970. Station now owned by Getty. Well at Neighborhood Inn started to pump gas in July 1977. Exxon has performed borings. Case continuing.
Granites & Gneiss

A-19 Amoco, Neptune Twp., Monmouth Co., Spring/77
Located on Rte. 33 and Rte. 35, this station may have lost between 15-30,000 gallons. There was a recovery from 6" holes and a 12 x 24 well. Case is now closed. Tkw

A-20 Arco, Hammonton, Atlantic Co., 6/78
Approximately 2000 gallons of gasoline were leaked and 1200 ±300 gallons were recovered from the ground. Ditch recovery method was used and continued until Fall '78. Recovery system has been removed and case is closed. Tch

A-21 Amoco, Leonia, Bergen Co., 8/7/78
Approximately 8000 gallons of gasoline leaked and 700±200 gallons were recovered. Recovery was continued and leaking tank was removed. Gasoline periodically appears in storm and sanitary sewers. Explosimeter investigation of Leonia's sewer system is scheduled. If found clean, case will be closed. Investigation was performed in summer of 1979. No problem. Case closed. TRdb/TRS

A-22 Amoco, Morristown, Morris Co., 8/7/78
Approximately 3000 gallons of gasoline leaked and 225 gallons were recovered from ground by sump method. Recovery was terminated in fall of '78. Case closed. Qtm

A-23 Min Wax, Clifton, Passaic Co., 7/78
2650 gallons of mineral spirits were lost via delivery into the wrong pipe. Approximately 300 gallons recovered and contaminated soil removed to the Edgeboro Landfill. Case closed even though 2300 gal not recovered. TRb

A-24 Coastal Oil Co., Passaic, Passaic Co., 8/10/78
Unknown amount of #2 fuel oil lost; some into the Passaic River and some into the ground. Recovery wells (2") installed along bulkhead and inside tank dike. Very modest recovery and sheen into River cut off by repairing bulkhead.
Alluvium/TRb

A-25 Shell, Rte. 4; Paramus, Bergen Co., 8/78
Unknown amount of gasoline. Leakage occurred below ground into tributary Passaic River. Recovery and absorption along bank. Old tanks removed and replaced with 10,000 gallon fiberglass. Recovery totalled few hundred gallons. Case closed. TRb

A-26 Shell, Rte. 17; Paramus, Bergen Co., 8/78
Supposedly 1300 gallons of gasoline lost, but evidently a false alarm. No leaks observed, and tanks were replaced with no gasoline loss. Closed. TRb

A-27 Coastal Services, Paulsboro, Gloucester Co., 8/78
Unknown amount of oil/chemicals in groundwater. Lagoons seem to be primary cause of contamination. Groundwater decontamination is underway. Rec/Kmr

A-28 Air Products Corp., S. Brunswick, Middlesex Co., 9/78
A loss of several thousand gallons of vinyl acetate into surface drainage ponds due to reactor failure. This was pumped into nearby sewer. Soil samples indicate no penetration of spill; therefor no ground-water threat/ Case closed.
Qps & Kmr

A-29 Hillsborough Twp. (Stein residence), Somerset Co., 10/7/77
The contaminated well contained several organic chemicals (possibly gasoline components). Kentmore testing of adjacent airport tanks, but no clear case against airport. Well driller donated new well to homeowner, cased to 50 feet. Inconclusive investigation. TRb

A-30 Hexcel Corp., Sayreville, Middlesex Somerset Co., 6/77
Loss of unknown quantity of PBB's into shallow aquifer. Monitor wells installed with a recovery trench in October 1978. Collapse of dewatering trench due to the high ground water level. Therefore, a well header system was installed. As of early 1979 system was largely clogged. Another trench scheme installed in latter 1979 and ground-water decontamination continues discharging 1,1 dechloroethane (EDC) into adjacent sewer. Kmr

A-31 GATX, Carteret, Middlesex Co., 9/8/78
Black liquid leaching into the Arthur Kill river. There has been no followup until more data is received.
TRb/Kmr

A-32 Getty Oil pipeline, Bound Brook, Middlesex Co., 9/13/78
Approximately 16,000 gallons of #2 fuel oil leaked into Bound Brook, to Green Brook, to the Raritan River. Problem is confined to surface water due to broken pipe under the culvert. As a precaution the Elizabeth Town well was closed. No ground water problem, hence case closed. TRb

A-33 Shell, Hawthorne, Passaic Co., 9/25/78
Gasoline fumes in basement and storm sewer. Some gasoline was spilled into sewer, but no immediate ground water problem. Case closed. TRb

A-34 Phillips Oil Co., Hackensack, Bergen Co., 9/25/78
Approximately 10,000 gallons of #2 oil has leaked from the bottom of a 2 million gallon tank. Most of the oil was contained and removed from the dike area. Wells have been located. Wells monitored for a period of 1 month, no product was observed. Case closed. River deposits

A-35 R.P. Profiles, Howell Twp., Monmouth Co., 9/27/78
Here 150 gallons of Acetone and 260 gallons of resin were lost in a fire and explosion. The wash-down water went into a septic tank or dry well. No acetone odor detected and according to Ray English (Howell Twp. Health Officer) there is no problem. Tkw

A-36 Exxon (Walters), Ridge Rd. Lyndhurst, Bergen Co., 9/19/78
Approximately 3561 gallons of unleaded gasoline leaked due to a break in the lines and possibly leached from tanks.
TRb

A-37 Jacks Texaco, Audubon, Camden Co., 9/18/78
A reported 1000 gallons was lost from a leaking line. Two 4" wells were installed and within the first 2-3 weeks 1200 gallons were recovered. As of 12/15/78 5000 gallons were recovered and recovery operation is continuing. Recovery operation is in the process of being terminated and case closed. Ket

A-38 Deans Oil Co., Mahwah, Bergen Co., 9/78
Unknown amount of gasoline discovered through sewer excavation explosion. Recovery trench installed and few tens of gallons recovered. No further gas detected. Presumed minor loss. Case closed late 1978. TRb

A-39 Fuel Oil; Oaklyn, Camden Co., 10/5/78
Fuel oil is seeping into several basements during periods of rain. Oil seems to be backing up in the sewer line then into the houses. Cause of spill unknown. Tmv

A-40 Municipal Well Contamination; South Brunswick, Middlesex Co., 12/19/77
Well #11 with 600 ppb trichloroethane on 12/19/77. Well shut down and a massive State and consultant program to pin-point sources, using pump test, sampling, tens of monitoring wells. Several probable sources. Consultants report of May 1979 agree essentially with Departments analysis. IBM sited as principal source of organics. Consent agreement signed in May 1980. Kmr

A-41 City Service, Edison, Middlesex Co., 10/19/78
Gasoline spill occurred from a leaking 12,000 gallon fiberglass tank. An estimated 13,000 gallons were lost and a well recovery(12") of 9,600 gallons has taken place. Plume delineated with 3" observation wells and use of resistivity data. No groundwater contamination resulted, case closed. Wells still intact at station. Qtm

A-42 Getty Pipeline Break, Martinsville, Somerset Co., 10/29/78
Contaminated domestic well. Pipeline broke on Shanok property. Potential sources are most likely to be pipeline break, but there is a slim possibility of a buried heating oil tank leak. TRb

A-43 Blue Star Exxon, Scotch Plains, Union Co., 11/29/78
Gasoline spill of 9000 gallons. Five observation wells were drilled and no product was found. Determined to be a paper loss. Case closed.

A-44 Mobil station, Haddon Twp., Camden Co., 12/4/78
An unknown amount of gasoline was spilled here. Recovery is continuing and has consisted of a ditch recovery with a dewatering sump and an on-site gravity separator. Kwb

A-45 Hoboken, Hudson Co., 9/25/78
Leak from a heating oil tank has developed. Fuel oil(#2) is leaking into a basement. Source has since been detected and eliminated. Fill

A-46 Texaco, Pompton Lakes, Passaic Co., 10/31/78
1500 gallons of gasoline has spilled from a leaking tank. Recovery has continued with the use of a combination dewatering and skimmer well. So far 300 gallons have been recovered. It is 30 feet to the water table. A total of 500 gallons was recovered. Recovery well has been grout sealed. Case closed. Qsd

A-47 Brooklyn Mt. Rd., Hopatcong, Sussex Co., 12/4/78
Fuel oil contamination of a domestic well. Investigation has indicated source of oil probably is owner's oil burner. Gneiss

A-48 Northwood, Lake Hopatcong, Morris Co., 2/21/78
Fuel oil contamination of a domestic well. Cause could be neighbor's fuel line or it may be his own fuel tank. Gneiss

A-49 Texaco, West Long Branch, Monmouth Co., 10/30/78
Several thousand gallons of gasoline lost due to leaking underground tanks. Recovery wells installed and have begun to recover gasoline, case closed. Tvt

A-50 Mobil Oil, Paulsboro, Gloucester Co., 12/78
Approximately 900 acres of soil and the ground water has been contaminated by oil from this refinery. Kmr

A-51 Atlantic City, Atlantic Co., 2/78
A series of fuel oil contamination problems due to leaking of home fuel oil storage tanks, case closed. Qbs

A-52 "Power Test" Gasoline Station, Greenbrook, Middlesex 10/76
Undetermined amount gasoline leaked into the ground approximately 11 feet below grade. Adjacent nursery well contaminated with gasoline. Backhoe holes were dug and a well installed in bedrock for recovery. Power test has since paid for new well for nursery. Case closed. Monitor well secured and there has been no gasoline evident in the new, potable well as of January 1979. Trb

A53 Jersey City (corner of Paterson Plank Rd. & N.Y. Ave.)
Hudson Co. 12/78
Adjacent Exxon and Getty stations leaking unknown volume gasoline. Fumes detected in basements of nearby row houses which forced evacuation. Recovery wells located at each station and a trench behind row houses worked well for recovery and quick dissipation of fumes. Several 100 gallons recovered and case closed in 1979.
Trb,ds

A-54 Kraemar's Sunoco, Toms River, Ocean Co., 12/18/78
Approximately 7000 gallons of unleaded gasoline leaked into groundwater on November 16, 1978. This spill was reported to the State on December 18, 1978. Several observation wells and one recovery well and one recovery well have been installed. Cleanup began on March 1, 1978. Tch

A-55 Mobil Station, Stockholm, Sussex Co., 2/26/79
An underground gasoline tank is leaking into a marshy area located on Route 33. No investigation has begun as of March 11, 1978.

A-56 Arlington Warehouse, Newark, Essex Co., 1/25/79
Warehouse fire left a large amount of contaminated water in basement which was leaking into subsurface. Site cleaned up by the office of Hazardous Materials Control. Ground water evaluation completed as of June 1979. Recovery system for groundwater installed in basement but not used. Monitor wells remain. Clean up costs exceed $1 million. TRb

A-57 Ashland Chemical, Newark, Essex Co., reported 3/12/79
Approximately 2500 gallons of #4 fuel oil has leaked into ground. This spill has lead to the discovery of oil and solvents in Ashlands storm sewer system. In five days 5000 gallons were recovered. A second recovery system installed as of May 1979 for solvents. No real recovery effort as of May 1980. Recent/TRb

A-58 Texaco Gasoline Station, Willingboro, Burlington Co., 3/9/79
There is a cracked elbow in the gasoline distribution lines. Extremely shallow water table has resulted in gasoline appearing at surface on adjacent Seven-Eleven store parking lot.
Observation wells have been installed to determine extent of the subsurface gasoline contamination. Recovery will likely be accomplished by trench method. Tanks are presently being tested by Texaco Engineers and amount of product is unknown to date. Tanks were tested and determined competent. Gravel packed trench with dewatering well has been installed for recovery. No product was recovered and gasoline declined to undetectable limit in observation wells, case closed. Ket

A-59 Penn Gasoline Station, Belvidere, Warren Co., 3/7/79
Number 2 fuel oil entering Pequest River one mile upstream continuing of its confluence with the Delaware River.
A collection sump was installed with sorbent materials and flow to the river has been eliminated. Exact source still being investigated.
Source determined to be spillage from unknown diesel vehicle into storm sewer.
Oil cleared up and cased closed.
Fill and Alluvial material

A-60 Burlington Co. Highway Dept., Mount Holly, 4/12/79
Approximately 6000 gal. of regular gasoline in Wenonah sands. Explosive reading in nearby office. Migrating in several directions. County has removed about 1500 gallons but very poor cooperation from County Freeholders. By mid-May 7 observation wells were installed and the estimate of gas in the ground now estimated to be at least 110,000 gallons. Large diameter recovery well will be installed. Large diameter Recovery well was installed 6-79. Double pump system. Approximately 60,000 gallons has been recovered continuing.

A-61 Lopez Residence, Budd Lake, Morris County, 4/79
Approximately 500 to 1000 gallons of fuel oil lost from domestic tank. Nearby home well has fuel oil odor. Tank has been removed and recovery effort unsuccessful. A replacement water well will be installed, with extra casing.

A-62 Lafayette DOT Maintenance Yard, Lafayette, Sussex Co. 5/79
4000 gal. gasoline and 4000 gallons of fuel oil lost into glacial valley fill over dolomite. Monitor wells and large diameter recovery well installed as of May 1979. Cause was faulty tank installation. Spills not reported immediately by DOT. Essentially no recovery and case closed late 1979.

A-63 Getty Service Station, Hillside, Union Co. 3/79
Unknown amount of gasoline lost to groundwater resulting in fumes in nearby homes and temporary evacuation. Recovery wells installed and recovery rate excellent. Approximately 9000 gallons recovered as of 1 May 1979. Duration of recovery unknown. Station closed as of April 1980.

A-64 Mount Freedom Domestic Well, Mt. Freedom, Morris Co. 5/79
Private home had gasoline-contaminated well. Lost 500 gallons from on-site storage. Replacement well drilled, and this had gas within few weeks. Had carbon filter on supply; in court with driller (D&F). Department ocated a 3rd well across foliation and cased to 100 feet. Drilled and on line as of May 1980.

A-65 American Cyanamid Spill, Bound Brook, Somerset Co. 3/79
About 80,000 gallons of analine spilled from ruptured pipeline onto ground. Most of the contaminated soil removed and a recovery trench and sump installed. Most of the spill recovered with contaminated groundwater treated in Cyanamid's on-site carbon treatment plant. Progress report due in April 1980; none as of June 1980.

A-66 Chiarella Residence, Lake Hopatcong, Sussex County, 8/79:
Fuel oil pollution of 95 foot well. 9.46 feet of fuel oil product in well. Owner's tank and lines are in good condition.
gneiss

A-67 Bocskor Residence, Lake Hopotcong Prospect Point, 7/79:
Fuel oil pollution of two wells. 0.45 feet of fuel oil product in Bocskor well. 10 feet to bedrock. Recommended drum separator on Bocskor well.
bgn

A-68 Haar, Alpine Drive Lake Hapotcong, Morris County, 7/79:
3 wells possibly contaminated by septic tank effluent. One well has a fuel oil odor. No known source. Contex oil across the street.
bgn

A-69 N25 Housing Project, Trenton:
Fuel oil flowing from beneath building into abandoned sewer. Four observation wells drilled. 0.25 feet of fuel oil product in well number 2. Recovery of approximately 4000 gallons of fuel oil was obtained from sewer. No recovery wells were requested.
Fill

A-70 Bi-lo Station, Milleville, Cumberland County, 6/79:
2000 gallons of gasoline lost on the site. 2 wells installed, then used separator. Five to six feet to water.
Tch

A-71 Temple Har Sinai Site, Ewing Township, Mercer County, 5/79:
Fuel oil leaked from storage tanks that were previously buried at site. It contaminated local ponds. Ponds were cleaned up. Further investigation revealed product movement through subsurface. Heavy rains brought more product to the surface. The surface material was then cleaned up. All buried fuel tanks were to be removed. Bedrock varies from 2 to 15 feet below surface. Ground water depth varies.
Trl

A-72 Exxon Station, West Orange, Essex County, 8/79:
Suspected leak in one tank due to presence of water in tank. Two monitoring wells installed which have not shown evidence of product. Ground water at approximately 5.7 feet in the excavated tank pit. No evidence of product when tank was removed on September 24, 1979. Bottom of excavation separated from bedrock by several feet of clay. Trbs

A-73 West End Ave., Lake Hopatcong, Sussex County, 9/79:
Unknown contaminant in 2 private wells. 3 ppm oil and grease. Resampling and analysis for hydrocarbons was suggested.
Gneiss

A-74 East Brunswick, Middlesex County, 9/79:
Fuel oil in 2 private wells at depths of 160 and 260 feet. 3 ppm hydrocarbons. Kmr

A-75 Texaco Station, Old Bridge, Middlesex County, 9/79:
1500 gallons of regular gasoline lost into coarse sand and gravel. Aerial extent of gasoline has been delineated with explosimeter. Sump pump recommended on site. Qps

A-76 Bloomfield Ave., Clifton, Passaic County:
Gasoline in a sewer and an excavation. This site is adjacent to a Chevron Station which may be the source. Lines at the Chevron station are to be tested. Trb

A-77 Exxon Route 17, Hasbrouk Heights, Bergen County, 9/79:
Various losses since 1969. Gasoline present in septic tank and stream. Three slam bar holes exhibited explosive readings. Monitor wells were requested.
Overburden and Trb

A-78 Tenneco, Fords, 8/6/79
Approximately 10,000 gallons of formaldehyde leaked from an above ground storage tank and flowed overland into an unlined impoundment, it was subsequently pumped at a controlled rate to the Middlesex County Sewer System. Monitor wells of 3-4 inch diameter were installed at the request of Groundwater Section. Water samples have been taken from the drilled wells to determine the degree of groundwater contamination by the formaldehyde spilled. If formaldehyde concentrations are high monitor wells have been designed to also serve as an abatement system. formaldehyde analyses were less than background. Kmr

A-79 Dupont, Parlin, 8/7/79
Approximately 10,000 gallons of acetone leaked from underground supply line. The site of the spill is within the outcrop (recharge) of the Oldbridge sand. An observation well was drilled the source of the acetone. A fine-medium clean sand was encountered to a depth of 44 ft in the well where a clay stratum was encountered. A heavy acetone odor was present to a depth of 20 feet. No water was encountered when the well was drilled. Well was removed (10/79) and area was asphalted to prevent infiltration and migration of acetone. Case closed. Kmr, Old Bridge Sand

A-80 Tenneco, Carlstadt, 9/10/79
Approximately 2,000 gallons of varsol lost from a buried tank of unknown volume. The water table is at the surface, causing varsol to be trapped against the base of an asphalt pavement. The tank will be filled in. Case closed.
fnd, Meadowland Mack

A-81 Gulf Station East Orange, Springdale Ave. & N. Clinton Ave.
Gulf engineer suspected leak because of the presence of a hole in the tank. Two wells were put in; fumes were in the well closest to the street corner. Water levels on September 24, 1979 at approximately 14.27 ft. to 14.63 ft. from the casing tops.

A-82 Nutley Municipal, 8/21/79
An unknown amount of #2 fuel oil leaked for an unspecified time. Recovery well with separator system was installed.
River deposits over Brunswick

A-83 NJIT, Newark, 10/9/79
Approximately 4-5000 gallons of heating oil lost at NJIT campus. Fill over weathered Triassic Brunswick

A-84

A-85 Midwest Emery Freight, Jersey City, 10/17
Fuel tank leak, oil seeping into Hackensack River. Cutoff trench installed and monitor wells to be drilled.
silty sand

A-86 Getty Station, Willingboro, 10/1
Station showed a loss of 200-1000 gallons in three tanks with holes. The tanks are sitting on silty clay. Monitor wells will be installed.
Qps

A-87 Amoco & Citgo Stations, Vineland
Gasoline in Bell Telephone cable, no tanks appear to be leaking. It is recommended that monitor wells be drilled.
Tch

A-88 Exxon, Garden State Parkway, Bloomfield, 10/20
Gasoline seeping into stream. Handex Company conducting clean-up operation. Monitor wells and recovery wells recommended.
Glacial Till

A-89 Exxon, Garden State Parkway, Montvale, 10/20
Gasoline leaking beneath station. Handex Company conducting clean-up operation. Monitor and recovery wells recommended.

A-90 Dover Christian Nursing Home, Dover, 10/19
Gasoline vapors in basement of nursing home. An independent station is located 40 ft. away and failed pressure tests. Approximately 2500 gallons were recovered by a well installed between the station and nursing home. Gasoline vapors in the nursing home basement have subsided. Additional monitor wells are requested.
glacial silty, sand & boulders

A-91 Exxon Station, Johnsonburg, 10/27
Three wells contaminated by gasoline from an Exxon station. Loss from gas station unknown but 300 gallons were recovered. Monitor wells were installed. It is recommended that deeper wells be installed.
overburden and Ca

A-92 Carlucci-Vacaro Drive, Buddlake
There is a yellow viscous fluid in the well. The fluid appears to be a lubricant from the pump however this needs to be confirmed.
bgn

A-93 Methodist Church, Boonton Twp., 12/1/79
The Church has a shallow (15 inches) well with an occasional fuel oil order. In December 1978 there was a surface spill at the rear of the building. All other wells in the area are accepted. Boring a deeper well is recommended.
sand & gravel to 90 ft.

A-94 Foot Hill Rd., Bridgewater Twp., 8/79
Private well of Staikaponlos family is contaminated with petroleum product, identified as gasoline by Towney Labs; all other wells in the area are reported ok.
Trb with clayey overburden

A-95 Exxon Station, Fairlawn, 12/1/79
Loss of 600 gallons of gasoline due to a line leak. Six monitor wells were installed, recovery of gasoline is accomplished by periodic pumping of recovery well.
silty sand over Trb

A-96 Texaco, Cresskill, 12/79
Loss of 2000-3000 gallons of gasoline. There were 14 monitor wells installed and a recovery well that is 24 inches in diameter and 20 feet deep. An additional trench may be required in the adjacent yard.
silty sand (glacial)

A-97 Dunn Walke Farm, Bedminster, 1/80
Fuel oil leaking into storm sewer on private farm and discharging into a nearby stream. The tank was replaced but the loss is unknown. Three monitor wells were requested.
Trb

A-98 Lynhurst, 1/80
Gasoline odor in a home adjacent to a 72 inch diameter sewer. Tanks in 2 nearby stations Kentmore tested as acceptable. The well at a Getty station showed no product. There was only a problem in one home.
silt (Passaic R. floodplain)

A-99 Highland Park, 2/80
Gasoline odor in sanitary sewer system. Four buildings were evacuated. A local Datsun dealer lost 2000 gallons, but is not the source of the odor. A local Mobil and Texaco station are suspected. Wells are requested near these stations.
Trb

A-100 Conrail yard, Hoboken, 2/7/80
Fuel oil seeping into canal, probably due to a concentration of tank leaks, line leaks and spillage over the past 100 years. Fourteen initial monitor wells recommended along with cutoff tunnels near the canal.
fill (Hudson River)

A-101 Edgewater Terminal, Edgewater, 2/10/80
Seepage of oil into Hudson River from storage tanks.

A-102 Exxon, Margate, Atlantic Co., 8/1/79
Approximately 2,000 gallons of gas were lost from a leaking fuel line. Line was repaired and over 2000 gallons were recovered. Case closed. Qcm.

A-103 Shell, Margate, 8/1/79
Several hundred gallons of gas were lost from a leaking storage tank. A recovery system was set up and 250 gallons were recovered. Case closed. Qcm

A-104 N.J. Bell, Shrewsbury, Monmouth Co., (A) 2/6/80
Reported loss of approximately 500 gallons of gas from two 10,000 gallon storage tanks. The tanks were recovered and three monitor wells were installed. No gas was found in any well. Water depth is 30' and the gas may be tied up in the soil. Case closed. Krb

A-105 Candlewood Exxon, Howell Township, Monmouth Co., (A) 3/21/80
Approximately 200 gallons of gas was lost from leak in a discharge line. The line was repaired and four monitor wells were installed. Explosimeter readings and well information found no trace of gas in the ground. Case closed. Tch

A-106 Emil's Gulf, Hazlet, Monmouth Co., 3/26/80
An unknown amount of gas was lost from a leaking storage tank. The tank was removed and three monitor wells were installed. The wells showed no gas accumulation in the ground. Case closed. Ket

A-107 Hulses Rd. Abandoned Gas Station, Howell Twp., Monmouth Co. 3/21/80
Five storage tanks were removed during demolition of an abandoned gas station, with an unknown amount of gas left in the ground. Recommended installing six monitor wells to determine the amount and extent of gas under the site. Tkw

A-108 Exxon, Morganville, Monmouth Co., 3/28/80
An on-site well has been contaminated, possibly because of spillage from an adjacent 12,000 gallon above ground storage tank owned by the Jamesbury Fuel Oil Co. Recommended four monitor wells to determine amount of oil in the ground. Ket

A-109 Chevron, Hazlet, Monmouth Co., 4/8/80
Fuel oil has been seeping into an adjacent creek from an unknown source. The on-site 3000 gallon fuel tank was tested and found to contain no leaks. Two monitor wells have been installed, and at least two more will be put in. Kwb

A-110 Borough of Rocky Hill - Somerset County - Municipal Supply well contaminated 2w/Trichloroethylene; area underlain by Brunswick Shale; several possible sources all under investigation; problem recognized fall 1979

A-111 West Amwell Elementary School - Hunterdon County; school well contaminated with organics, principally trichloroethylene, area underlain by Brunswick Shale and Diabase intrusions; investigation being carried out with Region V Enforcement Element; several possible sources; problem recognized spring 1980

A-112 Lakeland Regional High School - Passaic County; fuel oil spill in 1976, estimated loss 400,000 gallons, oil leaching into stream south of school. OHSC opened spill fund June 1980, recovery program being instituted. Area underlain by pre-cambrian gneiss and cover of stratified drift.

A-113 Sanero home - Middlesex Boro - high concentration Barium and Chlorides in well. Investigation conducted in conjunction w/ Region II Enforcement Element. Suspected cause municipal salt stockpile nearby.

A-114 Fairlawn Public Wells late 1978
Several municipal wells contaminated w/organics. All City wells shut down. Industrial survey completed but not certain if source(s) stopped. Purging program recommended in June 1980. Qsd over Trb

A-115 Exxon Refinery (Bayway), Linden
Minor Hydrocarbon seepage into the Arthur Kill. Monitor wells proceeding inland from Kull have uncovered considerable product on water table. Recovery system designed and will be installed summer 1980.
fill over shale

A-116 Exxon Station, Boonton, Morris Co. 2/80
Inventory loss of 5000 gallons. Orders in 5 buildings. Eight observation wells in, recovery underway from 3' well. Chevron Station in opposite corner requested to test tanks, owner refused. Recovery as of 4/25/80 was 500 gallons. Water table at 18'.
Qsd over sandy clay

A-117 Conway residence, Branchville, Sussex Co. 2/80
300' ft well contaminated with orthodichlorobene. Septic fieldcleaner containing this chemical was used on the conway(s system in Sept. 1979. Recommended purging well and installing charcoal filter.
Omb

A-118 Mobil Station, Wanaque, Passaic Co. 2/80
Unknown loss, moving down sand and gravel valley, odors in 5 homes, watertable at 20'. Odors started in Jan 1980 and subsided. Requested 11 monitoring wells but met with opposition from distributor. Dealer hired consultant but cleanup to this point has been inadequate. Plume not delineated. Gasoline has moved 100 yrds from source. Still waiting monitoring wells as of 4/28/80.

Qsd

A-119 Texaco Station, Oakland, Bergen, Co. 3/11/80
Weekend loss of 3000 gallons. No prior inventory loss. 25' drop to stream adjacent to tanks. No product in stream, 1 monitor well drilled, free of product. Assumed to be theft.

Qsd

A-120 Gasoline odors in homes, Nutley, Essex Co. 3/14/80
3 homes with slight gasoline odors. All sewer lines free of product. Nearby Amoco, Gulf and Texaco tested tanks, found to be sound. Affected homes are surrounded by other homes free of odors.

A-121 Shell Station, Newark, Essex Co. 3/31/80
Loss of 600 gallons, strong odors in sewer lines, Eight monitor wells in, water table at 4', Installed trench parallel to affected sewer line.

silt & clay over Trb

A-122 Mobil Station, Freehold, Monmouth Co. 4/8/80
Odors in nearby Bell Tel cable prompted investigation of this station by OHSC. Odor problems in a hotel 2 blocks away. Eight tanks removed from site. Observation wells installed by the time we arrived on site. All wells were free of product or odor. (Well design unknown) Recovery of 1000 gallons of gasoline and other oils claimed by spill contractor. Two monitor wells recommended adjacent to Bel Tel cables. No further recovery recommended.

Krb

A-123 Exxon Station, Bernardsville, Somerset Co. 4/16/80
Inventory loss of 72 gallons. Four monitor wells installed. All wells free of product. Case closed.

Qm

A-124 Orange Exxon, Newark, Essex Co. 4/16/80
Inventory loss 3 monitor wells in, tanks removed. 1 well clean other 2 are dry. Requested that wells be deepened.

Silt and clay over Trb

A-125 Alert, West Orange, Essex Co. 4/16/80
Inventory loss, tanks removed, no product in excavation water table at 4'. case is closed.

Trbs

A-126 Exxon, Orange, Essex Co. 4/16/80
Inventory loss, 4 monitor wells installed, 1 well near tanks with 1/8". Requested recovery during tank excavation. Water table at 6'.

silt and clay over Trb

A-127 Mobil Station, Palasades Park, Bergen Co. 4/21/80
Unknown loss, odor in building behind station and down hill. Recovery trench dug between station and affected home. Recommended 3 monitor wells and additional trench.

fill over Trdb

A-128 Abraham and Strauss, Paramus Park Mall, Paramus, Bergen Co. 4/21/80
Loss of 200-800 gallons of fuel oil adjacent to building. About 800 gallons recovered from around building. Recommended 2 wells.

Fill

A-129 Rhone-Poulenc, New Brunswick June 1980
Loss of 6500 gallons of methacrolein diacetate from below-ground pipe. Highly topic chemical. Five monitor wells installed and recovery underway as of late June 1980. Little free chemical located.

trb

Illegal Dumping (D)

D-1 "Reich Property", Dover Twp., Ocean Co., '74
Industrial chemicals dumped on the Reich Property. These 55 gallon drums were from the Union Carbide plant at Bound Brook and dumped by N. Fernicola. Hundreds of wells were contaminated in Pleasant Plains area. Tch

D-2 Beachwood Plaza, Berkeley Twp., Ocean Co., 9/4/74
Various chemicals dumped behind Beachwood Plaza. Effect of contamination unknown but will be investigated upon arrival of instrumentation. At this site up to 15,000 drums containing chemicals such as Sodium, etc., were dumped. Tch

D-3 Pemberton, Burlington Co., 9/11/75
Some 1500 chemical drums have been dumped here. The liquid chemicals are present on the ground surface and will affect the quality of recharge water percolating down into the Cohansey sand which this dump overlies. Located in the Pine Barrens. Drums were removed in '76 and the case was considered closed. Modified monitoring wells installed and samples taken. Case may be reopened. Tch

D-4 Jackson Twp., Ocean Co., 5/24/76
Dumping of various chemicals and drums on the Walter Powers property. Phenols reported in wells, case closed. Tch

D-5 Jackson Twp., Ocean Co., Spring '77
Chemical drum dump of Union Carbide. Sambol construction owns the property. Drums have been removed to Dover by Sambol. Union Carbide has removed all drums from Dover and Jackson for disposal. Several drums spilled on the ground, case closed. Tch

D-6 Winslow Twp. (King of Prussia), Camden Co., 1/24/75
This liquid waste disposal site has several unlined lagoons and discarded drums of chemical waste. It has been found that observation wells show a high concentration of Cr and Organics. Surface evidence of damage caused by the operation is in the form of a large number of dead trees around the perimeter of the site in the groundwater flow direction. Site was to be closed and dumping ceased. Tch

D-7 Independence Twp., Warren Co., '77
Approximately 200 drums of Soy oil, etc. from a candy manufacturer (name not given) was stored and spilled in a gravel pit in the Pequest Area. Case closed. Qs

D-8 Keyport, Monmouth Co., '76
2000 drums of chemicals were reported to have been dumped here. Kmw/Kmv

D-9 Barrier Chemical, Vernon Twp., 6/78 Sussex Co.
At this site deliberate dumping of various chemical wastes on abandoned plant site. High amounts of trichloroethelene and benzene. Observation wells have been installed. Ca

D-10 Berless Bearing, Livingston, Essex Co., 8/78
Disposal of cutting oil into unlined pits behind the plant. Borings made and all oil-soaked soil removed along with the liquid. Fuel oil tanks pulled and replaced. Investigation sparked by odd analyses of the nearby Livingston city well. Case closed late 1978. TRb

D-11 Runyon Well Field, Old Bridge, Middlesex Co., '76
Deliberate disposal of 7000 gallons of PCB along road near well field for Perth Amboy. Consultant's report shows clean up effort by Department highly effective. Little PCB in ground water. Kmr

D-12 Elmwood Park, Berkley Twp., Bergen Co., 8/7/78
Stored containers of Zinc Chloride were deliberately punctured and spilled behind a Motorcycle Shop. At the site 12" of soil was then excavated and removed to landfill. The total spill was approximately 800 gallons and it has been suggested that an additional 18"-24" of soil should be excavated. Additional soil has been removed and excavation area filled with clean material-case closed. Saprolite/TRb

D-13 Bog Creek Farm, Howell Twp., Monmouth Co., 12/29/78
A dumping of paint wastes and chemical wastes has been practiced on dead animals to keep dogs away, hence it seeps into the stream. Five monitor wells installed, and sampled to delineate contaminated area. Tch

D-14 Lone Pine Landfill, Freehold Twp., Monmouth Co., 6/78
This landfill is illegally taking in chemical wastes such as fire explosives. In June of '78 there was an explosion at the site in question due to the chemicals that were dumped there. Tvt

D-15 Dairy Pak, Morris Plains, Morris Co., 10/13/78
Approximately 10,000 gallons of ink and solvents were dumped on property. In the cleanup approximately 300 cubic yards of soil were removed and taken to an appropriate land disposal site. Spill site was then capped with impermeable material to eliminate further leaching of residual contaminants adsorbed into the soil. Case closed. Qtm

D-16 Manzo Construction-Burnt Fly bog, Marlboro, Monmouth Co., 11/29/78
Illegal dumping of petroleum products into 3 unlined lagoons. Surface water contamination is present and dead trees have been sighted around lagoons in groundwater flow direction. After an on site investigation several hundred drums and four unlined lagoons were observed. Many of these drums contained toxic chemicals along with various petroleum waste products. Several drums were broken and leaking. Subsurface contamination was evident after seven holes were augered to a depth of 18 inches.
The odor of this oil and chemical-saturated sand was nauseating. Six moniotor wells installed, sampled. Soil, water samples taken throughout site. Case is presently in litigation. Ket

D-17 A & O Polymer, Sparta, 12/19/78 Sussex Co.
Land disposal of Ketone resin products for twelve years. On Dec. 19, 1978 there was a surface spill from within the plant and discharged into the Wallkill River. Domestic well less than 1/4 a mile from the plant.
Several additional wells have been found to be contaminated by assorted Organic compounds. Arrangements are being made to extend an existing water supply line to serve the individuals with contaminated wells. Water line has been installed to service local residents.
Investigation of exact source of chemicals is continuing. Installation of monitoring wells is planned to help delineate the extent of the subsurface contamination. Qsd-Ca

D-18 Franklin Lakes, Bergen Co., 03/79
Possible ground-water contamination by tetrachloroethylene. Source of illegal dumping has been confirmed to be Arlo cleaners on Franklin Avenue.
Cleaning compounds have been dumped into a pond on his property. Concentrations of tetrachloroethylene in these dumped wastes have been found to equal 22,000 ppb.
Investigation is on-going. TRb,PE,Qsd

D-19 K. Wickham, Jackson Township, Ocean Co., 3/79
Septic truck caught dumping by Jackson Township police on March 1, 1979. K. Wickham owned truck and property adjacent to Jackson Landfill. Truck contained septic wastes, benzene, toluene, xylene, butyl benzene and three unknown organic peaks. Tch

D-20 Little Silver Cleaners, Monmouth Co. Little Silver 1/29/80
Company is suspected of dumping solvents behind building. Adjacent pond has been contaminated. There will be further sampling of the pond. Krb

Industrial (I)

I-1 Magnesium Elektron, Kingswood Twp., Hunterdon Co., Summer '76
At this site there is an unlined lagoon with waste from their zirconium industry. Surrounding area wells have been found to be contaminated by high amounts of TDS, sulfates, Na, Cl, Ammonia, etc. No file. TRl

I-2 X-Cell Co., Belvidere, Warren Co., 9/76
Acetone in an unlined lagoon. Qs

I-3 Hoffman LaRoche, Belvidere, Warren Co., 7/7/75
Contamination of a large ground-water supply due to unlined lagoons. Qs/Omb

I-4 Northern Fine Chemical, Franklin, Sussex Co., 9/75
Chemical Company and the town of Franklin discharge into a sump. Part of the sump waste goes out through a pipe to a river and part into the ground. A new well 260' deep was contaminated by the sump which is directly up-dip from a well. Company is no longer in operation. Cl

I-5 Cellate, Franklin, Sussex Co., 6/75
Company dumped its waste down a mine shaft. This large volume of waste flowed underground through an old storm sewer to a river. Dye was traced in 1975. Company closed and left area in Nov. 1976. gn/msk

I-6 Metaltec., Franklin, Sussex Co., Fall '76
Waste cutting oil was being dumped into an unlined lagoon. Groundwater was found to have a high COD content. Qs-msk/Cl

I-7 Lucas Paints, Gibbstown, Gloucester Co., Spring/75
Paint waste that was dumped into a lagoon has contaminated the groundwater according to well analyses. Sludge disposal area is also contaminating groundwater. Tkw

I-8 Chemed., Howell Twp., Monmouth Co., 10/7/76
Silver stripping company discharged into an unlined lagoon and four wells were contaminated. Soil was removed here from 3'-8' deep, wells were closed and interim drinking water was brought in. After being sued by Howell Twp. for $4000 and once by D.E.P. for $1,250, Chemed closed its plant. Tch and Tvt

I-9 Rollins Environmental Service, Logan Twp., Gloucester Co., 4/70
This chemical waste treatment facility with its many unlined and lined lagoons has a severe ground-water pollution problem. Numerous monitoring wells have been installed to dilineate the extent of contamination. A system of abatement wells have been installed to remove and treat contaminated ground water. Kmv

I-10 Dupont-Chambers works, Deepwater, Salem Co.,
Severe ground-water contamination has occurred here. Recovery wells have been installed and groundwater has been treated. Qcm/Kmr

I-11 Shield Alloy, Newfield, Gloucester Co., 5/28/75
Contamination of a Borough well with Cr and chemical leachate from an existing lagoon. Stream also contaminated. Tch

I-12 Pine Wall Nursing Home, Ocean Co., 9/76
Ground-water contamination by large volumes of sewage from septic field. The wells at 40 and 90 feet deep were contaminated. Tch

I-13 IRC, Sayerville, Middlesex Co., Spring '75
Metal reclaiming Co. has contaminated groundwater. The pH of the water was 1 or less. Kmr

I-14 Exxon, Constable Hook, Hudson Co., 9/11/74
Oil found in the groundwater from refinery complex that continually discharged oil from tanks and pipelines. Exxon then was required to collect and retain for disposal all contaminated surface water on property, treat all contaminated surface runoff, and develop a system which will contain and remove all of the subsurface contamination. Qs/Rec

I-15 Shell Oil, Sewaren, Middlesex Co., Discovered in 73'
Gas leaking from pipes, tanks etc. over the last 50 years. In 1975 1.5 million gallons of gas were recovered by recovery wells. They are presently embarked on a decontamination program. Qs

I-16 Madison Industry, Madison Twp., Middlesex Co., '72
Zinc by-products stored on the ground. Perth Amboy Public Supply Wells have been contaminated. Old Bridge Sand. This firm and adjacent CPS are due for trial 29 May 1979. Kob

I-17 Plessey, Frenchtown, Hunterdon Co., '75
Metal plating wastes discharged into groundwater adjacent to Delaware River. Contaminants such as Ag, Zn, Ni, Cu, and Cn in groundwater. Plessey has decided on treatment and subsurface disposal or routing to Frenchtown system (Case inactive. Qal

I-18 CPS, Madison Twp., Middlesex Co., '73
Organic chemicals in the groundwater above Perth Amboy, Runyon well field. In court at present, and only 3 monitor wells have been installed. Old Bridge Sand. This firm and adjacent CPS are in trial. No decision. Kob

I-19 Bridgeport Rental, Logan Twp., Gloucester Co., '76
Oil in the groundwater from waste oil storage in an old gravel pit. Oil leaches into an adjacent marsh and the Delaware river. First discovered in 1969 and still a problem.
Qcm and Kmr

I-20 NL Industries, Pedricktown, Salem Co., '76
Lead contamination of wells from 1975-1976. Enforcement action and cleanup ordered. Consultants report and renewed activity in 1980. Kmr

I-21 Sparta Sand and Gravel, Sparta, Sussex Co., '75
Salt storage has contaminated area with Cl that is the major water resource for the region. The operators are installing ponds and have covered the piles. Qs

I-22 Phelps Dodge, South Brunswick, Middlesex Co., 6/75
Unlined lagoons received 500,000 gallons of waste liquid per day. Plant was closed down in '74 but lagoons remain. Possibility that groundwater in area is contaminated. Drum spill agreement and monitor wells installed as of May 1979. Under investigation.
Qps/Kmr

I-23 BASF, South Brunswick, Middlesex Co., 12/10/75
Styrene waste discharged into unlined lagoons. Possible contamination of groundwater from unlined lagoons. Preliminary evaluation completed, monitor wells drilled and consultants report in as of April 1980. Claim no ground water drainage.
Qps/Kmr

I-24 Certain Teed, Winslow Twp., Camden Co., Discovered in 1973
Phenols in groundwater from waste lagoons. There were at least five domestic wells contaminated. Lagoons were excavated and filled in. In 1978 further complaints received from home owners and company has been ordered to drill deep wells for affected homes. Tch

I-25 Johns-Manville, Winslow Twp., Camden Co., '76
Phenols were found in observation wells from a leaking pond. Study was done by A.W. Martin & Associates which discovered contamination in '75. New lined ponds being constructed. Tch

I-26 Biocraft Industries, Waldwick, Bergen Co., '75
Small drug manufacturer. Leaks were found in the subsurface tanks and lines holding organics. Tanks repaired; monitoring wells in and a withdrawal program began in '75. High amounts of organics found in the Quaternary deposits. Bedrock wells nearby. Decontamination proposed but no Consent Agreement by June 1980. Qbt/TRb

I-27 Accurate Forming, Hamburg, Sussex Co., late 1975
Spillage from storage area entered the Walkill River. Facility was required to line lagoons by Bureau of Oil and Hazardous Materials Control in 1975. Chromic acid lagoons are lined with 3 mil PVC and it has deteriorated. Investigation is continuing. Qsd/Cl

I-28 Allied Chemical, Morristown, Morris Co., 12/20/76
Carbon Tetrachloride and chloroform found in supply well. Consultant has installed monitor wells and conducted study. Well being pumped to waste. Concentration has stabilized at 20 ppb Report due mid-1980. Qtm and TRb

I-29 Fluid Chemical, Lakewood Twp., Ocean Co., 3/7/76
Cosmetic waste liquids and sludges were discharged on the ground surface and into the surrounding ground water over a five year period of operation. Tch/Qcm

I-30 Vineland Chemical, Vineland, Cumberland Co., since '73
Arsenic wastes stored on the surface with effluent disposal in percolation ponds. Arsenic found in surrounding wells, in the adjacent marsh, and in the nearby Blackwater Branch. Enforcement action. Treatment system installed in 1980. Improvised decontamination of ground water underway. Tch

I-31 Oxford, White Twp., Warren Co., since '73
A high concentration of iron is found in this well due to runoff from the abandoned Washington mine. pC

I-32 Mine Hill, Morris Co., since '71
Methane was reported in a well due to dumping of garbage and other material in the Byram or Milem Mine. pC

I-33 International Wire Products Inc., Wyckoff, Passaic Co., '76
International's effluent has high metals, flouride, sodium and chloride. By discharging to the ground the ground-water quality from selected wells, including there own supply, indicates elevated concentrations in sodium, chloride, Flouride, and Ni. Inactive. Qsd/TRb

I-34 Ventron, Woodridge, Bergen Co., since '74
Mercury has been found in the ground up to a depth of at least 3 feet. Also such contaminants as Cd, Zn, As, Cr, and Pb have been found. This 30 acre site is estimated to contain about 200,000 pounds of Hg, mostly under new warehouse. Currently in litigation with five defendents; Judge Lester presiding(1978). Q(Hackensack Meadows)

I-35 Albion, Winslow Twp., Camden Co., '76
Organics have been found in at least two wells in this development. There is no obvious source, but a homeowner may possibly be introducing organics via septic tank disposal. Inactive Tch

I-36 Monroe Twp., Gloucester Co., 11/3/76
Mercury found in two public supply wells. Source has not been determined. Tch

I-37 Fairfield, Essex Co., 4/1/76
Carbon tetrachloride and trichloroethylene have been found in 12 domestic wells. The investigation could not reveal any source that would presently be discharging these chemicals into the groundwater. There is a possibility that an unsewered industry nearby-"General Hose"-may be the source. Homes have gradually gone to municipal water.
Isolated pocket of Qsd

I-38 Fisher Scientific Co., Bridgewater Twp., Somerset Co., 8/76
Organics leaked from a railroad cut behind plant. Seepage from the outcrop is very slow but had access to the Raritan River. Basin directed design and procedural changes at plant. Case closed. TRb

I-39 Cooper Chemical, Washington Twp., Morris Co., 4/26/76
Iodine contamination of several springs about one-half mile from this Silver Iodide handling plant. Home owner has received new well from Cooper Chemical. The entire waste effluent system needs to be redesigned and engineered to reduce the amount of discharge to the environment, case closed.
pE

I-40 Ionac, Pemberton Twp., Burlington Co., 2/77
Monitor wells confirm groundwater contamination from unlined lagoons. Lagoons now abandoned. Ionac manufacturer of ion exchange resins, polymers and organics. Waste has access to also to the Rancocas Creek. Treatment system on line in early 1980 and consultant investigation to begin to deal w/lagoon sludges. Qcm/Kns

I-41 Tri-County Vegetable, Rosenhayne, Cumberland Co., 1/20/77
Spray irrigation of food processing wastes (peeling operation). High NO_3 content found in an on-site well and in the surrounding area wells. Monitor wells located 1979; not installed as of June 1980. Tch

I-42 Thatcher Glass, Wharton, Morris County, Summer/76
This plant's effluent is discharged through an old sewer line and gets into the glacial deposits in this area. There has been a complaint of oil/grease in a nearby potable well. Glacial

I-43 Swepco Tube, Clifton, Passaic Co., 9/7/77
Contamination of groundwater by hydrofluoric acid from pickling area. Four monitoring wells installed and manganese, flouride, nitrate, and iron found. Swepco has failed to institute a program of pumping groundwater into its treatment system and is still polluting as of 12/7/78. TRb Case inactive.

I-44 Polyrez Company, Woodbury, Gloucester Co., 10/7/77
At Polyrez there is a leachate spring in the filled area behind plant that has an organic odor and a low flow. PVC collection pipe was installed and the flow is to be collected for removal. Under investigation. Leachate still escaping from fill. Kmw

I-45 Yates Industries, Bordentown, Burlington Co., 10/27/77
A recent case where an assessment of the impact on the groundwater from old copper sludge lagoons and copper scrap is being made. Monitor well location recommendations have been made. Remedial program is in effect. The Ground-water report was prepared by Environmental Engineering, Inc.
Kmv

I-46 Riverside Metals, Riverside, Burlington Co., 8/31/77
Impact on the groundwater and recommendations pertaining to the unlined lagoons, filled with copper sludge, which are about 50' from the Rancocas Creek are now being assessed. Copper Sludge removed as of June 1978.

I-47 American Cyanamid, Bound Brook, Somerset Co., 9/77
Old industrial plant, with many lagoons; organic wastes are reaching overburden and shale. A possible threat to the off-site municipal wells and others. Seven monitor wells in rock and consultants report due mid-1980. TRb

I-48 Camden Municipal Wells, Camden, Camden Co., 7/14/78
Organics have been found in three city wells. Many possible sources have been sited and the most obvious possibilities are being evaluated, although there is little likelihood of isolating the source(s). Monitoring of the suspected wells are now being carried out weekly. Location of source(s) unlikely. Kmr

I-49 Kearny Power and Light, Kearny, Hudson Co.,
Mercury found in soil near the Passaic River from an old abandoned heating and generation system. Borings and soil analyses by Weston Inc.; there is the possibility of no ground-water movement due to a bulkhead. Draft of a Consent Agreement in June 1980.
TRb

70-971 O - 81 -- 8

I-50 Reichhold Chemical Inc., Carteret, Middlesex Co., 12/21/78
Surface discharge high in phenols, chloroform, oils, and grease is present which may enter the groundwater. Monitor wells have been installed. High phenol concentrations found in one monitor well-status continuing. Monitor well with high phenols is pumping the waste into the sanitary sewer system. TRb

I-51 Great Adventure, Jackson Twp., Ocean Co., 5/10/77
Monitoring of changes in the groundwater from spray irrigation and liming at Safari Park has taken place. Monthly analyses of the 12 monitor wells indicate change in ground-water quality. Expansion of spray field designed and installed for 1980 season. Tch

I-52 Culligan Co., Lebanon, Hunterdon Co., '77-'78
Runoff from piles of regenerating salt and high chloride wash water in septic system has polluted groundwater in the Brunswick Formation. At least four homes have been affected. TRb

I-53 Mahwah Well Field, Bergen Co., 01/79
Ground-water contamination by volatile organics. Old station well is presently pumping the waste. West Well field wells one and four have high concentrations of Trichloroethylene up to 445 ppb. Wells are all completed in unconsolidated sands and gravels. Recharge is predominantly induced from Ramapo and Mahwah Rivers.
Investigation is continuing although no point sources have been found to date.
Sampling is continuing and has included private wells to help delineate subsurface contamination. Results were clean-2 wells resampled.
The Village of Suffern N.Y. has a similiar organic contamination problem in their Municipal supply wells.
Cooperation between N.J.D.E.P. and Rockland County Department of Health has been helpful in locating additional potential sources for similiar Organic contaminants. Most recent analysis of Mahwah wells showed no presence of organic chemicals-continuing. Qsd/TRb

I-54 Fairlawn Well Field, Bergen Co., 01/09/79
Three out of seventeen wells are contaminated by volatile organics, such as Trichloroethylene, Trichloroethane, and Tetrachloroethylene. Sampling has continued since 01/09/79. Well is located in the center of an industrial park. Case relatively inactive-Fairlawn buying water. TRb

I-55 Hawthorne Well, Passaic Co., 01/79

One well out of twenty-two in Hawthorne's Well Field is contaminated by volatile organics, such as Trichoroethylene, Trichoroethane, and Tetrachloroethlene. Sampling was done in January of 1979.

Two possible sources: Inmont Corporation and an old mercury processing plant now operated by Calgon Inc. Drilling program proposed at Calgon May 1979.

I-57 L.E. Carpenter and Co., Wharton, Morris Co.5/79

Filter bed comtains reddish-orange liquids: chemical storage tanks once buried, have been bouyed to the surface by high water table. Public water supply wells (4) are located downstream .5 to 1 mile.

Wehran Engineering submitted a sludge removal and ground water monitoring program for the facility to the State of New Jersey. (4) Four monitor wells have been installed at the site under the supervision of Wehran Engneering. Sediments at rear of property are extremely permeable, boulders, gravel and coarse sand. Sampling of the wells by the Department is essential. QTm, Qsd

I-58 Kauffman-Minteer, Inc., 5/15/79, Jobstown, Burlington Co.

Possible ground-water pollution from a 100' x 500' unlined storage lagoon containing plasticizers, detergents, lube oil, and waxes from tank truck wastewater. Two monitor wells installed, sampled. kns

I-59 International Flavors and Fragrances, Union Beach, Monmouth Co.

The groundwater has been contaminated (COD, volatile organics) from spills or leaks in some of the 20,000 55 gallon storage drums on the property. IFF has been fined $25,000, and ordered to install 9 monitor wells. Cse is under litigation. kwb

I-60 New Jersey Water Company, Washington, Warren Co., 4/19/79

Trichloroethylene at levels of over 100 ppb have been found in Well No. 4 and tetrachloroethylene at levels of over 100 ppb in Well No. 3. Investigation has been started to determine the source.

I-61 Apex Plating, Franklin Township, Warren Co.

Ground disposal of plating waste has lead to contamination of 3 wells. The cadmium plating operation taken out of service as soon as the problem was found. Company in process of developing a treatment system.

I-62 Ashland Chemical, Fords, Middlesex Co. 4/79

Chemical plant on meadow mat over Raritan-Magothy. Foul unlined lagoons, and a chemical spill. Organics on water table. Monitor wells will be drilled to cover the property and meet DPCC requirements which are upcoming.

I-63 Tennaco Chemicals, Fords, Middlesex Co. 4/79
Chemical plant on meadow mat over Raritan-Magothy V. Formation. Monitor wells installed by consultants to cover the property and evaluate extent of ground-water impart. Report in preparation May 1979. STill

I-64 Republic Wire Co., Rahway, Union Co. 5/79
Low-pH pond behind plant, overflowing septic tank and on-site spills. Considerable local publicity. Monitor well locations recommended on 11 May.

I-65 CBS Records, Pittman, Gloucester Co. 1/79
Plating effluent into unlined lagoons behind very large record-manufacturing plant. Poor housekeeping. Monitor wells located January 1979.

I-66 Metasol (Calgon), Hawthorne, Passaic Co. 2/79
Related to Hawthorne municipal well investigation for City (I-55). Property is near 3 City wells. Organics and mercury on ground. Program recommended in May 1979 to take soil samples, install monitor wells and sample the aquifer.

I-67 ARC Co., Boonton, Morris Co. 5/79
A lagoon on the site is unlined and receives wastes from the electronic operations part of the plant. A considerable amount of heavy metals and organic compounds render the untreated effluent quite toxic. Although there is no indication of any wells being contaminated, it is logical to assume ground-water degradation. Monitor wells have been installed by Moore trench. Wells will be sampled to determine the impact of past disposal into the unlined lagoons and to monitor future discharges as part of their discharge permit.
Pre-C gneiss

I-68 RFL Inc., Boonton, Morris Co. 5/79
A Lagoon on the site is unlined and receives untreated production waste. Effluent contains toxic metals and organic compounds. While no evidence of water supply contamination is present, some contamination may be expected. It was recommended that 3 monitor wells be installed to determine movement and quality. Wells were installed by Moore Trench at same time as Arc to determine the impact of past disposal into the lagoons and to monitor future discharges as part of their discharge permit. Pre-C gneiss

I-69 Colloid Chemical, Hanover, 11/28/79
Phenol in cooling water discharge seeping into Whippany River as a result of poor housekeeping and surface spillage. Monitor wells, a cutoff wall and sampling are recommended.
glacial till over clay

I-70 Harvest Pickle Co., East Vineland, 11/79
Complaint from neighbor that Harvest Pickle Co. located on Post Rd. had been dumping brine on the gravel. The dumping of brine resulted in high chlorides in the ground water which resulted in contamination of the neighbor's well. Bridgeton over Tch

I-71 Plumsted Twp., Ocean Co. 2/26/80
A large number of drums dumped ± 20 years ago at five localities was brought to the attention of Ground Water. An investigation by Ground Water on 2/27/80 revealed dumping of both drums and liquids. The materials observed seem to be a rubber and caulking type waste. Monitor wells requedted Tvt, Tkw, Tch

I-72 BP, Paulsboro. 6/1/79 Gloucester Co.
Eleven monitor wells have been installed to determine extent and composition of the various petroleum products under the site. Awaiting results of sampling. KmL

I-73 Winner Chemical, Paulsboro, Gloucester Co. 8/1/79
Various oils, etc. are handled at the site. Ground-water contamination from an unlined lagoon and tank farm. Two monitor wells have been installed, Company will clean up lagoon and farm, and set up a ground-water recovery system. KmL

I-74 Homasote Co., Ewing Township, Mercer Co. 7/5/79
The company has an unlined wastewater lagoon. One monitor well has been installed to determine possible ground-water pollution. Awaiting results. Trs

I-75 Texaco, Westville, Gloucester Co. 10/15/79
There are two unlined API separator sludge lagoons on-site causing possible ground-water pollution. KmL

I-76 Inland Chemical, Newark, Essex Co. 12/10/79
There is possible ground-water pollution from drum spillage and tank and line leaks. Inland recovers various chemicals. Recommended installation of fi ve monitor wells. Trb

I-77 Landis Sewage Authority, Vineland, Cumberland Co. 11/2/79
The authority has 40 acres of unlined settling ponds for sewage sludge. Stream samples were taken to determine extent of surface/ground water contamination. Tch

I-78 Monitor Devices, Wall, Monmouth CO. 3/6/80
Untreated wastewater from the company's plating business has been dumped on the ground for three years. Recommended the installation of three monitor wells to determine extent and nature of ground-water pollution.

I-79 Comtron, Inc., Manalapan, Monmouth Co. 56/1/79
Untreated wastewater has been discharged onto the ground for approx. 15 years. Comtron cleans copper, aluminum, and brass pipes, and plates metals.
Recommended installation of three monitor wells to determine extent and composition of pollution. Kns

I-80 Elastomers, Ltd., Keyport, Monmouth CO. 3/11/80
Latex from the plant's wastewater discharge has been dropped on the ground adjacent to a "percolation" lagoon. The company has agreed to remove the latex and to design a new treatment system. Kwb

I-81 Airtron-Litton Morris Plains - Unlined wastewater disposal lagoons completed in Qtm overlying Qsd. Sample two abandoned supply wells on property downgradient of the lagoons and came up with extremely high levels of T.C.E. - (Refer to files for concentrations). Also sampled Mennen Co. well across Hanover Blvd. from Airtron and detected high concentrations of T.C.E. Buried Valley aquifer appears to be affected on a greater than local scale. Dairy Pack, located directly North of Mennen Co. should also be investigated as a potential source (Additional). Sludges in Airtrons lagoons have been sampled and found to contain high levels of T.C.E. Company has been ordered to remove all sludge immediately.

I-82 Albert Steel and Drum - Newark, N.J. abandoned solvent recovery site. Assorted drums, laboratory packs and mercury packs found disposed on and beneath the site. The site is Pliestocene deposits up to 100 feet overlying Triassic Shale. The City of Newark now owns the property and has set aside as part of a agreement with NJDEP 200,000 $\pm$ for investigating the site. Status is continuing.

I-83 Troy Chemical - Newark is directly down stream of Albert Steel Drum. Has numerous illegal discharges into the creek as well as soil contamination by organics and high levels of Mercury. Geology is the same as Albert Steel. Status: Basin is pursuing a Consent Agreement with the Company which is about to charge hands.

I-84 Dupont-Parlin-Fabric Division - Investigated abandoned disposal lagoons. Recently had four monitor wells installed to determine impact of past discharges. All wells are completed in the Old Bridge Sand. Wells have been sampled and indicate low level organic contamination in the Old Bridge. Resampling is essential to the investigation. The monitor wells at Duponts landfill were also sampled. A problem exists with these wells as they need to be re-developed or deepened. Investigation is continuing.

I-85 Hatco Chemical, Fords, Woodbridge - Sloppy housekeeping, lagoon disposal of assorted chemicals. Site is situated on the Woodbridge clay overlying the Farrington Sand. The Company has aquired the services of Weston as Groundwater consultants. Investigation is continuing.

I-86 Abex, Mahwah, N.J. - Disposal of wash water into unlined lagoons completed in Qsd in Ramapo R. Valley. Discharge contains silica from Iron molding process and high iron. Sampling of discharge into the lagoons and monitor well adjacent to the South Lagoon indicate no problem exists. Company will be required as part of their groundwater discharge permit to monitor the well adjacent to the South Lagoon and the discharge into the North lagoon on a quarterly basis.

I-87 Ford, Mahwah - Disposal of sludges into unlined lagoons over the last 29 years - lagoons are completed in Qsd deposits and are coincident with the water table. Ford is not cooperating with the Department. They refuse to install monitor wells. Case will be going to a hearing.

I-88 Pioneer Metals - Franklinville, N.J. - Plating operation disposed of wash down wate and dip water into a swamp adjacent to their property. They have two 30 $\pm$ ft. well points to supply both process water and potable water. These wells have been sampled and contain high levels of hexavalent chrom. Domestic wells across the Rd. and a local high school well down dradient have been sampled. No metals were detected above background in any of them. Cohansey needs to follow up.

I-89 Reichhold Chemical - Carteret - Pleistocene overlying Trb Monitor wells were drilled at the site in early 79. One of the wells had high levels of phenols. This well is presently being pumped at 10 $\pm$ gpm as part of a decontamination program. The majority of the wells are completed in a silty sand, however the well #1 with the high phenols is completed in extremely permeable slag material disposed of by a previous company. The site is situated on the Auther Kill River. During low tide, phenol odor is noticeable in the low tide pools along the river banks. Site needs further investigation.

I-90 Tenneco-Fords - Site is situated on the North side of Raritan River overlying the Farrington Sand. Converse, Ward and Dixon have been contracted by the comparing to do a multiphas groundwater contamination investigation. Phase I has been completed monitor wells have been installed and groundwater quality analysis completed. Adefinite problem has been documented however no remedial action has been proposed. Needs further investigation.

I-91 Hummell Chemical Co; South Plainfield 4-80
Chemical plant processing large number of elements and organics. Hearing held in May 1980. Threat of ground water contamination from spills and housekeeping. Pressing for monitor wells as of June 1980.
QsD over Trb

I-92 Chevron (Ortho Division), South Plainfield June 1980
Pesticide plant next to Hummell Chemical. Long standing poor housekeeping and probable "backyard" disposal of chemicals. Monitor wells installed in 1979 by consultant. Consultant's report due approx. July 1980. Decontamination probable.
QsD over Trb

I-93 Kearney Industries, Piscataway April 1980
Phenol wastewater discharged to ground and later to septic tank system. Now going to sewer. Then overburden over shale. Monitor wells may be recommended.
Trb

I-94 Monsanto, Pedricktown May 1980
Anonymous information that on-site drilling has found serious ground-water pollution. Consultant is executing the program. Follow-up by Department requested in May 1980.

Kmr

I-95 Cel - Rex, Nutley 4-1980
Rare metal (Au, Ag etc) reclaimation, processing operation. Adjacent condominium excavation uncovered contamination traceable to the firm. Department has requested monitor wells and a consultant in June 1980. Site near Passaic River.
Overburden on Trb

I-96 Amerchol Coporation - Edison Twp. - Middlesex County
Suspected ground-water contamination from unlined waste lagoons containing high concentration of organic solvents. Area underlain by Brunswick Shale, very little overburden. Three monitor wells requested in June 1980.

I-97 Okonite Cable Company - North Brunswick Twp. Middlesex County
Suspected ground water contamination from waste lagoons and oil spills on-site. Overburden is glacial sand and gravel, underlain by the Raritan-Magothy Formation and the Brunswick Shale. Initial field visit June 1980.

Sanitary Landfill(s)

S-1 Fenimore Landfill, Roxbury Twp., Morris Co., 2/11/75
When visited in February of '75 the operation was described as one of the worst landfill sites. Many violations were in progress, but the worst of the violations was the fact that they were accepting chemical drums on and in the landfill. Sampling in '75 showed degradation of Drakes Brook. As of 4/25/77 the disposal site was ordered to cease its operation and submit plans for proper closure. Qs+Qm/Granite Gneiss

S-2 Ottilio Dump, Newark, Essex Co., '75
Continual dumping of chemicals and drums into pits that have been excavated to the water table. Area was to be filled in and further dumping prevented. Wastewater from landfill bleeds into a tributary of the Passaic River. TRb

S-3 Price Trucking, Doughty Mill, Atlantic Co., '72
This landfill, which has accepted many millions of gallons of chemicals, has contaminated groundwater in the surrounding area. Atlantic City Well Field is located nearby. Closed by state in 1976. Tch

S-4 Helen Kramer Landfill, Mantua Twp., Gloucester Co., 8/12/75
This landfill has accepted chemicals and oil which in turn has contaminated the groundwater. The oil is bleeding out into a creek through 200 ft. of virgin ground. Kmw

S-5 Dover Twp. (SLF), Ocean Co., 9/25/75
The landfill has received chemical drums at one time and buried them in the Cohansey aquifer. This burying of drums (some containing sodium) may or may not be responsible for the ground-water pollution in Pleasant Plains. Four monitor wells have been drilled and more will be put in. Tch

S-6 Toms River Chemical, Toms River, Ocean Co., '72
Groundwater is contaminated in area surrounding TRC's landfill and lagoons. PCB related compounds have been detected in observation wells on both sides of the Toms River. Tch

S-7 Hayden Chemical, Manchester Twp., Ocean Co., 4/18/73
They have been discharging penicillin wastes into a lagoon. Analyses of wells indicate PCB-type compounds and organics. Over the years millions of gallons of liquid have been discharged into the ground. Site closed. Tch

S-8 Lakewood Twp. SLF, Lakewood Twp., Ocean Co., '72
It has been reported by the fire warden that several thousand drums have been buried here. No analyses on the groundwater have been taken. Tch

S-9 Lakewood Twp.-Prospect Rd., Ocean Co., '73
A small number of drums have been disposed of on this site. Tch

S-10 Ocean Landfill Corp., Manchester Twp., Ocean Co., '72
Thousands of drums along with millions of gallons of liquids have been dumped here. Thus far there has been no analyses on or around landfill site. Tch

S-11 Wantage Twp., Sussex Co., '75
Landfill leachate flows into a cave and resurges at a spring one-half mile away. In 1976 landfill was ordered closed. Oe

S-12 Baker Chemical, Harmony Twp., Warren Co., '76
Arsenic contamination of groundwater from sludge and chemical lagoons. Qs/Ca

S-13 Baker Chemical, Lopatcong Twp., Warren Co., '76
In the landfill there has been a disposal of chemical containers with some liquid and solid wastes. It should be known that a large capacity public supply well approximately 500' away from the site showed organic chemicals. Qs/Cl

S-14 Kin Buc, Edison, Middlesex Co., '75
Chemical dump site filled with drums of liquid chemicals. Millions of gallons were dumped per week. Site is now closed. Qp/Kmr/TRb

S-15 Princeton Disposal, South Brunswick, Middlesex Co., '75
Chemical drums and liquids were disposed of on this site. There is a serious ground-water contamination problem here, but it seems that Princeton Disposal blames it on the Spillatore site which is across the street. Qs/TR

S-16 L&D, Mt. Holly, Burlington Co., '74
Here there is a leachate contamination of domestic wells. Recovery and treatment of groundwater ordered. Kmw

S-17 JIS, South Brunswick, Middlesex Co., '76
Organic chemical contamination of domestic well due to disposal of chemical wastes in landfill. Leachate plume moving toward Monroe Township's private wells about a mile away. Case before appelate court as of 1979. Qp/Kmr

S-18 Sparta Township Landfill, Sparta 1976
This landfill has received large amounts of septage. There have been spills into the Paulins Kill. Geophysical mapping of the area indicates there is a severe ground-water contamination with the landfill as a likely source.
Qsd/COk

S-19 Nick Lipari Landfill, Mantua Township, Gloucester Co., 1975
This landfill is closed, but did accept chemicals from Rohm & Haas. Organic chemicals are in the monitor wells and flow into the Chestnut Branch. Still in litigation as of December 1978.
Qp/Tkw

S-20 Jackson Township Landfill, Jackson Township, Ocean Co., Nov. 1978
Ground water is polluted with at least 41 different organic chemicals which are felt to have originated from the dumping of liquids at this landfill over a period of six years. Landfill is currently closed to liquids and the Groundwater Section has been intimately involved in delineating a zone of contamination using monitor wells and geophysical methods.
Tch

S-21 Monroe Township Landfill, 7/79 Middlesex Co.
Private wells contaminated with organic chemicals from a closed landfill. Chemicals were received and drum disposal in nearby woods has occurred. The full extent of damage has not been determined as of July 1979. Important aquifers are affected. A full investigation will be underway in early July involving sampling, resistivity, refraction seismology and drilling.
Kmr

Septic Tanks-(ST)

ST-1 Barry Lakes, Vernon Twp., Sussex Co., 4/78
Possible ground-water pollution from malfunctioning septic systems which are located in glacial, clayey soils, and discharged to fractured gneisses. Hepatitis outbreaks in the last three years may possibly be water borne. Bowe & Walsh, Inc. recommend sewering this area in their 201 plan. Eight residents have sued Vernon Township, et al to fix or replace malfunctioning septic systems. DEP has joined suit against builder as an individual and as a corporation. Alternate septic systems were designed for seven residents but will cost more than $10,000 each. Primary issue at this time (February 1980) is to alieviate immediate problem of malfunctioning septic systems without expending large sums of money because area will be sewered within two or three years.
pC

ST-2 Fleck and Ayoub, Warren Glen, Warren Co., 6/78
Two septic systems have been overflowing for a period of a year. After a thorough investigation, alternative system was then designed for the two residences. COK

ST-3 Berkeley Heights, Union Co., 3/78
A problem of an overflowing septic system. A thorough geologic investigation prompted installation of sewers. Trbs

H:T:R32:A1-29, B1-9

Mr. FLORIO. Thank you very much. Your testimony has been helpful. We have a vote. I will be back in about 10 minutes and we will proceed with the balance of the panel.

[Brief recess.]

Mr. FLORIO. The committee will reconvene.

I would ask the other witnesses to identify themselves.

Mr. HANG. I am Walter Hang with the New York Public Interest Research Group.

Mr. BORCHERS. Harry Borchers, manager, North Penn Water Authority.

Mr. FLORIO. Mr. Hang, I assume your colleague is with you?

Mr. HANG. This is Sherry Oster and Donna Troccoli, who are members of Dump the Dump, a Long Island citizens group that was organized when their community became concerned about the Hauppaugh landfill which is a known source of toxic contaminants and which lies directly over the Magathy aquifer which supplies drinking water for their community. They are here in case the committee has any questions of them.

Mr. FLORIO. You may go forward.

STATEMENT OF WALTER HANG

Mr. HANG. Greetings. My name is Walter Hang. I am a staff scientist with the New York Public Interest Research Group, Inc. (NYPIRG), and coordinator of their toxic chemicals project. Thank you for inviting me to present NYPIRG's views on the threats to drinking water quality posed by the improper handling of hazardous waste. NYPIRG is New York's largest private research and advocacy organization. Over 120 full-time professional staff work with our 150,000 members in 23 offices located from western New York to the eastern end of Long Island.

In 1976, concerns about the effects of toxic chemicals in the environment prompted NYPIRG to establish a toxics project. Since then, scientists trained in varied disciplines have undertaken three major studies of chemical pollution. Staff have also served as technical consultants to the Environmental Protection Agency's people and toxics program. NYPIRG has been awarded a regional certificate of appreciation.

My testimony today primarily reflects firsthand information gathered during those indepth investigations. I am coauthor of "Troubled Waters: Toxic Chemicals in the Hudson River (1977)," and "Toxics on Tap: Chemical Contamination of Long Island Drinking Water Supplies (1980)."

Mr. FLORIO. There has been put into question the credentials of some of the people associated with your organization. Perhaps you might want to say something about your own credentials.

Mr. HANG. OK, I am a molecular biologist by trade, formerly from the Rosewell Park Memorial Institute in Buffalo, N.Y. I have been involved with cancer research since 1973. I have been working strictly on toxic chemical projects with NYPIRG and with the Environmental Defense Fund which has cosponsored some of my work since 1976. Joseph Salvo, who is a coauthor of the study, has been involved with NYPIRG since 1977. He is a Long Islander. He is also a biochemist by trade and has a master's degree from Stoneybrook University in environmental sciences and together we completed this study, with help from colleagues in other organizations for peer review, et cetera.

Mr. FLORIO. Thank you.

Mr. HANG. Also a forthcoming study of the Niagara River to be published this fall. A copy of "Toxics on Tap," which details the findings and recommendations stemming from our 2-year study of Long Island's sole source of drinking water, has been provided for the record of this hearing.[1]

Based on 4 years of continual scrutiny of local, State, and Federal environmental and public health programs in New York, I must characterize present governmental efforts to deal effectively with the impact of improperly disposed of hazardous wastes on drinking water as woefully inadequate.

A myth has been carefully perpetrated in America that toxic chemical contamination is under control. In fact, little could be further from the truth. Existing management programs are incapable of preventing the release of toxic pollutant into the environment. Instead, they accomplish the opposite by systematically sanctioning industrial discharges. Consequently, toxic pollution is rapidly spreading into the water, land, and air environments of many areas of the country, especially in the heavily industrialized regions such as New York.

The contamination of the Hudson River with over 450,000 pounds of PCB's, the pollution of Lake Ontario with tons of Myrex, and the Love Canal tragedy are not isolated incidents. They are evidence of a widespread toxic contamination dilemma. Unfortunately, due to the extremely limited amount of monitoring for synthetic organic chemicals, our inability to control toxic discharges is matched by our failure to detect it. The result is a burgeoning pollution problem that is largely unnoticed by the programs designed to cope with it.

As the contamination pervades our environment, it creates drinking water pollution. Persistent toxic chemicals discharged into the environment-at-large are destined to find their way into drinking water supply sources. Since few water supplies in the country are equipped to remove trace levels of toxic synthetic organic chemical residues, millions of consumers are unknowingly dosed with cancer-causing and otherwise toxic compounds in their drinking water.

In short, a twofold scenario confronts the Nation: One, toxic contamination is beyond the control of existing pollution control

[1] The "Toxics on Tap" study referred to may be found in the subcommittee files.

and drinking water protection programs. Consequently, in the years ahead there will be an increase in the levels of ubiquitous synthetic organic chemicals; and two, that will result in a concurrent increase in our collective intake of toxics via drinking water, air, food, and other routes of exposure. Subsequently that will probably result in elevated rates of environmentally induced diseases, such as cancer.

Let me describe New York's environmental and drinking water dilemma to illustrate the crisis I have outlined. As a highly industrialized State, New York produces a great deal of hazardous waste, on the order of 1.36 million tons per year.

The infamous Love Canal in Niagara Falls is an example of what happens when hazardous wastes are mishandled.

Without a systematic hazardous waste management program in effect, industrial wastes have been disposed of in a similarly haphazard manner all over New York State. The most recently completed survey, entitled: "Hazardous Waste Disposal Sites in New York State, First Annual Report," has identified 680 sites, "where known or suspected hazardous waste disposal sites have been found." This actually includes a total of 852 separate disposal areas found on the 680 properties, an increase of 332 from the survey completed just over 1 year ago.

Many of these sites were previously characterized in a report entitled: "Toxic Substance in New York's Environment" as follows:

> These sites contain an enormous variety of toxic materials found under a wide range of conditions. A few sites have been granted permits as controlled disposal areas for hazardous waste, but many are obsolete or abandoned sites where inappropriate soil and groundwater conditions allow the escape of toxic substances and materials lie open to direct contact by people and animals.

However, the situation is even worse than these details make it appear to be. In reality, health and environmental authorities know extremely little about any of the dumps. As a result they are incapable of taking appropriate action to manage the health and environmental threats they pose. The critical flaws in the survey as a whole are summed up by the description of the site evaluation process:

> In most cases, the evaluation shown on the individual site report forms are preliminary, and based on extremely limited information about materials present, soil and water conditions at the site, apparent effects on biological systems or industrial practices.

In short, the overwhelming majority of the sites have neither been comprehensively investigated nor controlled as sources of toxic contamination.

In particular, Long Island's environmental dilemmas are representative of the twin failures on the part of Government to properly cope with hazardous waste and safeguard drinking water quality. At least 25 hazardous waste dump sites have been identified on Long Island. Three of these dumps are known to contain massive amounts of hazardous waste generated and landfilled by the Hooker Chemicals and Plastics Corp./RUCO Division, including: the company's property in Hicksville, N.Y. where approximately 38 million gallons of heavily polluted waste waters containing the potent human carcinogen vinyl chloride were dumped between 1956 and 1975; the Syosset municipal landfill, where hazardous wastes were landfilled between 1946 and 1968, with maximum

estimated output of 800,000 pounds annually; and the Bethpage municipal landfill, where Hooker dumped a maximum of 1,600,000 pounds of solid and liquid wastes per year, between 1968 to 1978.

The general vicinity around the three dumps is known to be the most heavily contaminated area in Nassau County, yet comprehensive monitoring to detect ground water pollution originating from the dumps has not been undertaken. Nor has a study of the health threats posed to the 4,000 people residing in the community adjacent to the Syosset dump been made. Nor have any of the dumps been cleaned up. In short, the authorities have failed to take appropriate action, even though details of Hooker's dumping practices have been available for over a year.

Meanwhile, drinking water quality is deteriorating all over Long Island. Invasive contamination has already forced health authorities to close approximately 30 public water system wells and over 100 shallow private wells. Approximately 40 percent of the wells in Nassau County tested by health authorities have been discovered to have some level of toxic contamination. Yet none of the drinking water treatment facilities are equipped to remove toxic pollutants effectively.

Presumptive evidence indicates that Long Island's polluted environment already takes its toll of victims. Nassau County's overall age-adjusted cancer mortality rates for white males and females are ranked in the top 10 percent of the Nation, according to a National Cancer Institute Study.

In contrast, less polluted Suffolk County has dramatically lower cancer mortality rates. Rates for white males are characterized as "not significantly different from U.S." Rates for females are characterized as "significantly lower than U.S."

In fact, New York's overall cancer mortality rate ranks it second highest in the Nation. The areas of the State with the highest cancer mortality rates are all located in the heavily industrialized and highly polluted regions. Action must be taken to protect the public health of residents in those areas.

Fundamental changes must be made immediately in order to protect America's health and environment from hazardous and toxic wastes. Otherwise, in all likelihood, a heavy price in human lives will be paid in years to come. NYPIRG's research clearly proves that new standards or an intensified continuation of existing programs will not suffice. The promulgation and implementation of regulations developed under authority of the Resource Conservation and Recovery Act (RCRA) is already far behind schedule. However, even if the regulations were available today they would provide inadequate protection. Infrastructure improvements desperately need to be made. Existing programs lack basic analytical, legal and field assistance support. Without these essential services, hazardous waste management is doomed to failure.

Given the fact that these programs are largely ineffective, drinking water pollution is sure to grow worse. For that reason NYPIRG urges you to take swift action to make sure existing pollution control and drinking water programs are vastly improved. The bill introduced by Representative Gramm would accomplish the opposite. Therefore NYPIRG strongly urges you to oppose it.

The bill would alter the SDWA in unacceptable ways: instead of embodying a preventative approach which would anticipate adverse health effects before they could take place, action could only be taken to react to damage that had already been done. Instead of covering contaminants which may have an adverse effect on human health, the proposed amendments would apply only to contaminants already shown to pose an unreasonable risk. Since the vast majority of the toxics found in water have not been tested for the full range of dangerous effects they can cause, if the bill passed, it would be exceedingly difficult to provide adequate protection based on the limited data that are presently available. The bill would also eliminate the authority to prescribe treatment techniques that are effective in reducing the levels of the broad spectrum of toxics found in water, such as granular activated carbon filtration. Finally, if the bill passed, it would suspend Federal standards for fluoride, barium and radium until further studies could be completed. This action would be taken despite the fact that a substantial body of evidence supports the usefulness of the standards, which were originally recommended by the U.S. Public Health Service in 1962.

New York's hazardous waste and drinking water dilemma graphically illustrates the tremendous need for the strictest of protection programs. In the years ahead many areas of the country will probably discover that they have the same toxic contamination problems that New York is struggling to cope with today. The Congress must immediately take action to strengthen the hazardous waste and drinking water program, not cripple it. The health of the Nation depends on it.

Thank you. I would be happy to try to answer any questions my testimony may have raised.

[Testimony resumes on p. 129.]

[Mr. Hang's prepared statement follows:]

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TESTIMONY OF STAFF SCIENTIST WALTER HANG

before the

SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT

and the

SUBCOMMITTEE ON TRANSPORTATION AND COMMERCE

U.S. HOUSE OF REPRESENTATIVES

AUGUST 22, 1980

May it please the Chairman,

Greetings. My name is Walter Hang. I am a staff scientist with the New York Public Interest Research Group, Inc. (NYPIRG) and coordinator of their toxic chemicals project. Thank you for inviting me to present NYPIRG's views on the threats to drinking water quality posed by the improper handling of hazardous waste. NYPIRG is New York's largest private research and advocacy organization. Over 120 full-time professional staff work with our 150,000 members in 23 offices located from western New York to the eastern end of Long Island. Working together, we conduct independent, non-biased research and shape public policy. Consumer protection, environmental preservation, energy, government accountability, political reform and social justice are NYPIRG's principal concerns.

In 1976, concerns about the effects of toxic chemicals in the environment prompted NYPIRG to establish a toxics project. Since then, scientists trained in varied disciplines have undertaken three major studies of chemical pollution. Staff have also served as technical consultants to the Environmental Protection Agency's People and Toxics program. My testimony today primarily reflects first-

hand information gathered during those in-depth investigations. I am co-author of Troubled Waters: Toxic Chemicals in the Hudson River (1977), Toxics on Tap: Chemical Contamination of Long Island Drinking Water Supplies (1980) and a forthcoming study of the Niagara River to be published this fall. A copy of Toxics on Tap, which details the findings and recommendations stemming from our two-year study of Long Island's sole-source of drinking water, has been provided for the record of this hearing.

Based on four years of continual scrutiny of local, state and federal environmental and public health programs in New York, I must characterize present governmental efforts to deal effectively with the impact of improperly disposed of hazardous wastes on drinking water as woefully inadequate.

A myth has been carefully perpetrated in America that toxic chemical contamination is under control. In fact little could be further from the truth. Existing management programs are incapable of preventing the release of toxic pollutants into the environment. Instead, they accomplish the opposite by systematically sanctioning industrial discharges. Consequently toxic pollution is rapidly spreading into the water, land and air environments of many areas of the country, especially in the heavily industrialized regions such as New York.

The contamination of the Hudson River with over 450,000 pounds of PCBs (polychlorinated biphenyls), the pollution of Lake Ontario with tons of Mirex and the Love Canal tragedy are not isolated incidents. They are evidence of a widespread toxic contamination dilemma. Unfortunately, due to the extremely limited amount of monitoring for synthetic organic chemicals, our inability to control toxic discharges is matched by our failure to detect it. The result is a burgeoning pollution problem that is largely unnoticed by the programs designed to cope with it.

As the contamination pervades our environment, it creates drinking water pollution. Persistent toxic chemicals discharged into the environment-at-large are destined to find their way into drinking water supply sources. Since few water supplies in the country are equipped to remove trace levels of toxic synthetic organic chemical residues, millions of consumers are unknowingly dosed with cancer-causing (carcinogenic) and otherwise toxic compounds in their drinking water. Thus far, over 700 organic chemicals, generally of industrial origin, have been detected in U.S. public water supplies. Yet it is estimated that 90 percent of all the toxic chemicals consumed in drinking water remain unidentified. Furthermore, the overwhelming majority of the water supplies in America have never been monitored for toxic contamination. As we search more dilligently for synthetic chemicals, there can be little doubt that it will be discovered.

In short a two-fold scenario confronts the nation: 1) toxic contamination is beyond the control of existing pollution control and drinking water protection programs. Consequently, in the years ahead there will be an increase in the levels of ubiquitous synthetic organic chemicals; and 2) that will result in a concurrent increase in our collective intake of toxics via drinking water, air, food and other routes of exposure. Subsequently that will probably result in elevated rates of environmentally-induced diseases, such as cancer.

At its present rate cancer strikes one in every four Americans. Two-thirds of those inflicted with the sickness eventually succumb to it. Approximately 1000 people per day die of cancer in this country. But, in all likelihood, as

we live in an increasingly polluted environment, this rate will rise even higher in the years ahead.

Let me describe New York's environmental and drinking water dilemma to illustrate the crisis I have outlined. As a highly industrialized state, New York produces a great deal of hazardous waste, on the order of 1.36 million tons per year according to the State Department of Environmental Conservation. These wastes are composed of manufacturing residues of every kind, such as spent oils, solvents, greases, sludges and fluids. These materials are pollution in its most concentrated form. When the wastes are not disposed of in an environmentally safe manner, serious and widespread pollution can result.

The infamous Love Canal in Niagara Falls is an example of what happens when hazardous wastes are mishandled. Nearly three decades after the site ceased to serve as an active dump, a spectrum of toxic pollutants were discovered migrating through groundwaters draining the dump. After breeching the basement foundations of nearby homes, the chemical wastes caused an epidemic of birth defects and other health hazards among the residents of the community surrounding the dump.

Without a systematic hazardous waste management program in effect, industrial wastes have been disposed of in a similarly haphazard manner all over New York State. The most recently completed survey, entitled: Hazardous Waste Disposal Sites in New York State, First Annual Report, has identified 680 sites, "where known or suspected hazardous waste disposal sites have been found." This actually includes a total of 852 separate disposal areas found on the 680 properties, an increase of 332 from the survey completed just over one year ago. A total of 444 sites, or approximately 65% of the sites, were inactive as of July 25, 1979. As of that date the remaining 236, or 35%, were still active.

Many of these sites were previously characterized in a report entitled: Toxic Substance in New York's Environment as follows:

> "These sites contain an enormous variety of toxic materials found under a wide range of conditions. A few sites have been granted permits as controlled disposal areas for hazardous waste, but many are obsolete or abandoned sites where inappropriate soil and groundwater conditions allow the escape of toxic substances and materials lie open to direct contact by people and animals."

However the situation is even worse than these details make it appear to be. In reality health and environmental authorities know extremely little about any of the dumps. As a result they are incapable of taking appropriate action to manage the health and environmental threats they pose. The 680 identified sites include "known or suspected hazardous waste disposal sites," (emphasis added). Only a handful of the dumps have been investigated thoroughly. Virtually no monitoring has been undertaken at the individual landfills. Nor have comprehensive inventories of the kinds and amounts of wastes dumped at each site been compiled. Actual disposal of hazardous wastes has been confirmed at only 40% of the sites. Approximately 40% of the sites are of unknown size. These facts clearly illustrate the inability of the authorities to address the problem. Consequently the vast majority of the dumps pose largely undefined hazards.

The ignorance of the physical magnitude of the hazardous waste situation is exacerbated by equally meager data concerning the potential health and environ-

mental threats posed by each dump. Environmental assessments were based on generalities, "regarding the evaluation of possible environmental impacts from hazardous wastes found in dumpsites." Public health assessments are similarly inadequate: "Because of the scarcity of firm environmental and health data, most of the health assessments noted on the site report forms are simply general statements of health concerns and records of involvement of the Department of Health at the site." The catch-22 is obvious; since health authorities have rarely been involved in dumpsite investigations, little or no information generally exists. The critical flaws in the survey as a whole are summed up by the description of the site evaluation process: "In most cases, the evaluation shown on the individual site report forms are preliminary, and based on extremely limited information about materials present, soil and water conditions at the site, apparent effects on biological systems or industrial practices." In short, the overwhelming majority of the sites have neither been comprehensively investigated nor controlled as sources of toxic contamination.

In particular, Long Island's environmental dilemmas are representative of the twin failures on the part of government to properly cope with hazardous waste and safeguard drinking water quality. At least 25 hazardous waste dump sites have been identified on Long Island. None of them are structurally capable of preventing toxic wastes from entering the groundwater system. In all likelihood they are all sources of contamination. Three of these dumps are known to contain massive amounts of hazardous waste generated and landfilled by the Hooker Chemicals and Plastics Corporation/RUCO Division, including: the company's property in Hicksville, N.Y. where approximately 38,000,000 gallons of heavily polluted wastewaters containing the potent human carcinogen vinyl chloride were dumped between 1956 and 1975; the Syosset municipal landfill, where hazardous wastes were landfilled between 1946 to 1968, with a maximum estimated output of 800,000 pounds annually; and the Bethpage municipal landfill, where Hooker dumped a maximum of 1,600,000 pounds of solid and liquid wastes per year, between 1968 to 1978.

To date adequate efforts have not been made to assess or minimize the dangers posed by these dumps. All three are located in the critical recharge zone of Long Island's aquifer system, precisely where they can cause the most widespread and long lasting groundwater pollutions. Toxics released in that zone spread within the sole-source of drinking water for over 3.25 million residents. After approximately 3,000 years the pollutants dissipate into the surrounding seas. However, once the toxic chemicals enter the groundwater system, they are, for all practical purposes, irretrievable.

The general vicinity around the three dumps is known to be the most heavily contaminated area in Nassau County, yet comprehensive monitoring to detect groundwater pollution originating from the dumps has not been undertaken. Nor has a study of the health threats posed to the 4,000 people residing in the community adjacent to the Syosset dump been made. Nor have any of the dumps been cleaned up. In short, the authorities have failed to take appropriate action, even though details of Hooker's dumping practices have been available for a year .

Meanwhile drinking water quality is deteriorating all over Long Island. Invasive contamination has already forced health authorities to close approximately 30 public water system wells and over 100 shallow private wells. Approximately 40% of the wells in Nassau County tested by health authorities have been discovered to have some level of toxic contamination. Yet none of the drinking water treatment facilities are equipped to remove toxic pollutants effectively.

The longer pollution is uncontrolled on Long Island, the longer the aquifer system, drinking water quality and the public's health will remain in jeopardy. Since adequate pollution control measures are not immediately forthcoming, the quality of Long Island's groundwaters is sure to grow worse in the years ahead. As the island's residents are exposed to larger doses of toxic pollutants via inhalation, skin absorption or consumption in drinking water, their health risks rise commensurately. In the long run these toxic exposures constitute an even greater future threat to public health.

Presumptive evidence indicates that Long Island's polluted environment already takes its toll of victims. Nassau County's overall age-adjusted cancer mortality rates for white males and females are ranked in the top 10 per cent of the nation, according to a National Cancer Institute Study. These high cancer death rates may be directly linked to toxic pollutants consumed in drinking water or absorbed via other routes of exposure, for 60 to 90 per cent of all human tumors are believed to be environmentally induced.

In contrast, less polluted Suffolk County has dramatically lower cancer mortality rates. Rates for white males are characterized as "not signifcantly different from U.S." Rates for females are characterized as "significantly lower than U.S."

In fact, New York's overall cancer mortality rate ranks it second highest in the nation. The areas of the state with the highest cancer morta lity rates are all located in the heavily industrialized and highly polluted regions. Action must be taken to protect the public health of residents in those areas.

A cancer cure is all but impossible in the foreseeable future. This is plainly evident by the fact that cancer's incidence rate is climbing overall while its cure rate remains at a static low. Indeed, the five-year survival rate of cancer victims has remained virtually the same since 1950. While tens of thousands more people now contract cancer than 30 years ago, their chance of survival has barely improved. Instead of wishing for a cure, we must aggressively prevent exposure to toxic chemicals which are the causes of the disease. If we avoid contracting the sickness, there is no need to treat it or cure it - neither of which modern medicine can do effectively at this time.

Fundamental changes must be made immediately in order to protect America's health and environment from hazardous and toxic wastes. Otherwise, in all likelihood, a heavy price in human lives will be paid in years to come. NYPIRG's research clearly proves that new standards or an intensified continuation of existing programs will not suffice. The promulgation and implementation of regulations developed under authority of the Resource Conservation and Recovery Act (RCRA) is already far behind schedule. However, even if the regulations were available today they would provide inadequate improvements. Infrastructure improvements desperately need to be made. Existing programs lack basic analytical, legal and field assistance support. Without these essential services, hazardous waste management is doomed to failure. The very same problem hinders the wastewater discharge control programs developed under the Clean Water Act. In New York the State Pollutant Discharge Elimination System permit program has a non-compliance rate of approximately 50%.

Given the fact that these programs are largely ineffective, drinking water pollution is sure to grow worse. Unfortunately, like the hazardous waste

and wastewater discharge programs, the Safe Drinking Water Act (SDWA) remains mostly promise and little substance. As environmental pollution worsens, however, drinking water protection becomes more essential. Public health must be protected from toxics that will increasingly infiltrate water supplies.

For that reason NYPIRG urges you to take swift action to make sure existing pollution control and drinking water programs are vastly improved. The bill introduced by Representative Granim would accomplish the opposite. Therefore NYPIRG strongly urges you to oppose it. Safe drinking water regulations have been fought tooth and nail by many water purveyors over the years, in order to avoid implementing protective regulations that would greatly improve water quality. The oil and gas industry has joined this ill-conceived effort in an attempt to exempt themselves from control measures regarding underground injection of wastes which could contaminate groundwater supplies.

The bill would alter the SDWA in unacceptable ways: instead of embodying a preventative approach which would anticipate adverse health effects before they could take place, action could only be taken to react to damage that had already been done. Instead of covering contaminants "which may have an adverse effect," on human health, the proposed ammendments would apply only to contaminants already shown to "pose an unreasonable risk." Since the vast majority of the toxics found in water have not been tested for their full range of dangerous effects they can cause, if the bill passed, it would be exceedingly difficult to provide adequate protection based on the limited data that is presently available. The bill would also eliminate the authority to prescribe treatment techniques that are effective in reducing the levels of the broad spectrum of toxics found in water. Finally, if the bill passed, it would suspend federal standards for fluoride, barium and radium until further studies could be completed. This action would be taken despite the fact that a substantial body of evidence supports the usefulness of the standards, which were originally recommended by the U.S. Public Health Service in 1962.

New York's hazardous waste and drinking water dilemma graphically illustrates the tremendous need for the strictest of protection programs. In the years ahead many areas of the country will probably discover that they have the same toxic contamination problems that New York is struggling to cope with today. The Congress must immediately take action to strengthen the hazardous waste and drinking water program, not cripple it. The health of the nation depends on it.

Thank you. I would be happy to try to answer any questions my testimony may have raised.

Mr. FLORIO. Thank you very much.

Mr. HANG. Let me make one point. Earlier in the testimony it was said that our study had been challenged and had been criticized by the Nassau County Department of Health. Let me say for the record that we stand behind the findings of our study and let me say also that those challenges have been reviewed by technical staff, and when your staff looks at them they will reach the same conclusion that we have reached, that those are mainly cosmetic objections and do not challenge the substantive findings of this study.

Mr. FLORIO. Sir.

STATEMENT OF HARRY J. BORCHERS, JR.

Mr. BORCHERS. I am Harry Borchers, manager of the North Penn Water Authority in Lansdale, Pa. The North Penn Water Authority is a joint municipal authority incorporated by the boroughs of Lansdale and Souderton and the townships of Franconia, Hatfield, Lower Salford, Towamencin, and Worcester. The authority service area includes approximately 86 square miles and provides water service to approximately 50,000 residents of central Montgomery County. I submitted written testimony and I would like to just sort——

Mr. FLORIO. The statement in its entirety will be made a part of the record and you may feel free to proceed in a summary fashion. [See p. 133.]

Mr. BORCHERS. I will try to go as quickly as I can. I have been in the water works business since 1955, and, of course, we always checked our water for bacteriological contamination, and I personally sat back and often wondered that we might be poisoning people with that we did not test for and, of course, in the old days it was very difficult to test for lots of these chemicals and I suppose you could get a goldfish, put him in a sample of water and as long as he lived you figured you were all right. We are getting more sophisticated and we are looking for more chemicals. We check for heavy metals and other chemicals that are dangerous. We checked our water for that and found essentially none present: Then we come up with the organic problem and the fact that these are not necessarily poisons that kill people or things, but they are things that can create disease over long periods of time, carcinogens and the like.

We in early 1979 were aware of some problems that developed in Montgomery County, in the northwest corner of the county. There were trichloroethylene pollution spills that had occurred. This, of course, created a lot of telephone calls to our authority from residents wondering whether our water had trichloroethylene in it. The public thinks if it is spilled here it is going to leak all over the place.

Mr. FLORIO. What was the source of the spills?

Mr. BORCHERS. I think there were three different sources in the area. One was an industrial spill where a pipeline broke. The other I am not sure whether it was not just leaching away. They were all associated with industrial degreasing agents. We tested our nearest wells to this site, probably a mile away, all of our wells in that area tested free of trichloroethylene. We then contacted our major

industries who we thought might possibly use trichloroethylene and found none of them did use it. Then in remote Worcester Township, a little camp happened to check for TCE after parents worried and lo and behold they had trichloroethylene, so at this point, which was about August 14, 1979, we decided to test all of our wells. This was a voluntary thing. There was nothing mandated by EPA or Pennsylvania DER. I went on vacation and got a call—"seven of our wells contained TCE above the 4.5 limit which Pennsylvania DER had set." There was no MCL of course established for trichloroethylene. We immediately shut down these wells, took additional samples. The seven shutoff wells accounted for one-third of our supply. We are supplied by approximately 50 wells. But that did cut us back by about 1.3 million gallons a day. Fortunately we had had a wet year and we had enough water to go around.

Our authority did a lot of investigating on our own. Since last summer we have made over 1,000 chemical analyses for trichloroethylene. Most of these, the majority of them include at least three compounds, really running about 3,000 tests in addition to some a little more exotic tests.

We find that we have probably one of the most complicated pollution problems to solve that we have heard about. EPA thinks it is rather complicated. We have many old industrial sites where there were plants that used degreasing agents years ago and have gotten into the ground water somehow.

The degree varies. The most polluted well we have is 800 parts per billion ranging down to slightly over the limit. Some of these we may be able to use again by changing the limit or, of course, by putting in purification equipment.

Mr. FLORIO. Changing the limit on the basis of what?

Mr. BORCHERS. Well, we have permission to utilize some of our wells up to about 75 parts per billion. In other words, they feel that this would be the point at which the short-term affect would not be too great.

Mr. FLORIO. This is the State?

Mr. BORCHERS. No; this would be EPA.

Now, of course once you have gone to the paper and said we have shut down all of our wells that contain trichloroethylene, the debate becomes what should the limit be, because we know that when we get down to talking in parts per trillion there may be some TCE in all of us. It may be impossible but of course the public would like to have none. But what I learned, and I am not a chemist, is that there is no such thing as none, it is the lowest acceptable limit and the risk gets less and less until we cannot distinguish it. You might liken it to the automobile speed limit, 55 miles per hour. I am sure if we make it 4.5 mph we can save more lives. We get to the same degree in trichloroethylene and other organic pollutants. I cover this in retrospect, looking back, I think the biggest mistake was made in that we did not establish interim limits. One somewhat higher and then go out and test all water utilities, assess and find out how bad a problem do we have.

There are many, many utilities in Pennsylvania that have still not tested for trichloroethylene and some of these other organics.

There is no law requiring them to test. So we may well have places with thousands of parts per billion with people still drinking them.

In retrospect I would go back and say we should have gone in and looked for everything over 100 or 500, whatever the chemists say are the real problems, solve those problems first, then if we determined, we put in more research and determined that really there is good statistical evidence to say that the cancer rate is higher in a community that has been drinking 100 parts per billion, it ought to be reduced to 4.5 or 20 or whatever we could gradually work down, but you would eliminate the more serious problems first.

Mr. FLORIO. In the absence of Federal standards, it is my understanding EPA is working on standards for TCE?

Mr. BORCHERS. Right.

Mr. FLORIO. In the absence of Federal standards, would the existence of your State standards, presumably those standards were established on the basis of something, I am not sure I agree with your concept of action standard that would be arbitrarily higher until we find out what the real ones are. If we have to make a mistake, it seems to me we should be making the mistake the other way.

Mr. BORCHERS. If there is a momentous problem that we certainly ought to attack the most serious problem first. I do not argue, I cannot argue about the standard because I am not a medical person. My job is to provide the public with the purest water we possibly can. I think we moved exceedingly fast. Our authority really played a little EPA. We did all the investigating with industries. We met with industries. We got excellent cooperation. In one case we got 12 industries together and they contributed $12,000 toward the cost of drilling holes to try and find out where the pollution was coming from. We identified it, they hired consulting engineers to try and figure out the best way of reclamation.

We are not suggesting that the standard necessarily should be less. It should be whatever the safe level ought to be according to the medical people, but we should assess the total problem and see how bad it is. Certainly somebody just because they live in a little town in central Pennsylvania that has not heard about this deserves as much protection as somebody that happens to be served by our authority that took enough time to run the tests. The biggest problem, I think, was that it took EPA and DER, a long time to get started. I should not pick on EPA, DER, Pennsylvania Department of Environmental Resources. We got hit with this thing, we had seven wells out there where people that had individual homeowner wells out, it was very widespread throughout Montgomery County, to the point where DER could not handle all of the calls and all the investigations; they requested that EPA come in finally to investigate it. EPA did an excellent job. A lot of testing, a lot of talented young people, they did not know all the answers but they found them out in a hurry and we were very impressed with them and we do feel that there is just an awful lot more research that is needed to be known. For instance, a study in the Netherlands seems to indicate that trichloroethylene is not really associated with human cancer whereas trimethylamines seem to have proven they are. Let us hit the most serious problems first. We are

not ducking the issue. Our authority has shut down all the wells that had trichloroethylene in them. We ordered a carbon filtration plant for one well which must be pumped in order to protect the rest of our wells. We applied to EPA for a research grant to develop what we think are alternate methods. We found in testing that the airlift method of pumping water out of the ground will remove about 90 percent of the TCE. We want to look into a resin approach where we can steam regenerate the resin so we do not have to keep throwing it away. And this application is in to EPA. We hope that it gets funded and we believe it will. But we still think that EPA's and the Government's biggest place is in research, in finding out what are the health effects, what should the limits be, and it is not something you can pluck out of the air because they do create economic hazards for people.

[Testimony resumes on p. 140.]

[Mr. Borcher's prepared statement follows:]

STATEMENT OF
MR. HARRY J. BORCHERS, JR.
EXECUTIVE MANAGER
NORTH PENN WATER AUTHORITY
LANSDALE, PA.
BEFORE THE
SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT
SUBCOMMITTEE ON TRANSPORTATION AND COMMERCE

AUGUST 22, 1980

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

The North Penn Water Authority is a joint municipal Authority incorporated by the Boroughs of Lansdale and Souderton and the Townships of Franconia, Hatfield, Lower Salford, Towamencin and Worcester. The Authority service area includes approximately 86 square miles and provides water service to approximately 50,000 residents of central Montgomery County.

I am pleased to be here today to discuss the problem of ground water contamination as it has impacted our Authority.

NPWA HISTORY: During early 1979, we became increasingly aware of the problem of Trichloroethylene pollution of groundwater. The nearby Montgomery County communities of Collegeville and Rahns were the first to feel the impact of TCE. While spills in these communities and resulting pollution were not at all related to the eventual discovery of groundwater contamination within the service area of the North Penn Water Authority, they did serve to focus our attention on a potential problem. In early summer 1979, the Authority received numerous telephone calls from customers inquiring as to the TCE content of Authority water. Since the Authority had not tested for this compound, it was impossible to give an answer. Wells closest to the Collegeville area were tested and found to be free of T.C.E. (below the detectable level-less than 0.1 ppb). The Authority contacted several major industries in the area and found that none of them were using trichloroethylene. We therefore assumed we did not have a T.C.E. groundwater problem. In early August

the Variety Club Camp, located in rural Worcester Township, had their own private well water tested for T.C.E. and their wells were found to be polluted. The Water Authority, at this point, decided that all Authority wells should be checked. Subsequent checks showed seven of fifty (50) wells contained T.C.E. in excess of the recommended 4.5 ppb maximum suggested by PA. DER. These wells were immediately shut off and additional samples were taken. When the results were reconfirmed, PA. DER and EPA were notified. The seven wells which were shut off provided the Authority with 1.3 MGD or approximately 1/3 of its supply. The Authority was able to continue to meet its demand by purchasing additional water from the Keystone Water Company (a surface supply) and by utilizing additional standby wells. Fortunately 1979 was a relatively wet year and the Authority wells were at high capacity. At a later date an eighth well was shut down due to P.C.E. pollution. We began investigating possible sources of pollution. Numerous abandoned wells throughout the Borough of Lansdale and surrounding Authority territory were pumped and many were found to contain high levels of T.C.E. Simultaneously additional communities began testing their water for T.C.E. and it seemed for a while that everyone who tested found they had a problem. PA. DER found they had a staggering problem on their hands. Since it was not physically possible for them to do all of the investigating required, due to the large number of polluted wells found in central Montgomery and Bucks Counties, they asked the U.S. Environmental Protection Agency to take over investigating sources of pollution in the North Penn area.

Since August 14, ~~1980,~~ 1979 the Authority has collected over 800 samples from Authority wells, private wells, abandoned wells, streams, drainage culverts and, in addition, has drilled over 70 bore holes in an attempt to pinpoint the sources of pollution.

INDUSTRY COOPERATION: For the most part, the Authority has received excellent cooperation from industries in helping to locate the sources of groundwater

contamination. In several cases the Authority has been reimbursed for expenses incurred in the test well drilling operation. These drilling operations did indicate several sources of pollution and these industries have acted responsibly and have retained environmental consultants to work up a plan to decontaminate the aquifer beneath their property.

NO LONGER AT THIS LOCATION PROBLEM: Perhaps the largest problem to face the Authority is the problem of locating contamination on a particular site and finding the present owner was not responsible for the contamination. It may be impossible to prove which of several former companies that occupied the site were responsible for contamination.

IMPACT ON THE NORTH PENN WATER AUTHORITY: As we stated there was a tremendous impact on the Authority because of the loss of supply and the increase costs of purchasing replacement water (currently running in excess of $500 per day). There is also the problem of handling a very alarmed public about a problem which may be less dangerous than originally indicated. (Today there is still no certainty that trichloroethylene causes cancer in humans and there is talk of the final M.C.L. being increased above 4.5 ppb.) Additional testing has indicated the Authority has one of the most complicated groundwater pollution problems discovered to date. In addition to T.C.E. pollution, which may be coming from anyone of 14 sources, water from Authority wells has been found to contain the following chemicals:

1,1-Dichloroethylene
1,1-Dichloroethane
trans-1,2-Dichloroethylene
cis-1,2-Dichloroethylene
1,1,1-Trichloroethane
Carbontetrachloride
Trichloroethylene
1,1,2-Trichloroethane
Dibromochloromethane
cis-1,3-Dichloropropylene
Tetrachloroethylene

There is also the distinct possibility that other chemicals may be present, for which we have not tested. In addition to the expense of purchasing water, we have been forced to pump several of our wells 24-hours per day, into the sanitary sewer in order to keep the pollution plume from spreading to other Authority wells and neighboring residential wells.

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Authority customers will undoubtedly have to pay much of the cost of solving a problem that they did not create.

SPECIFIC PROBLEM REGARDING TRANSPORTATION OF T.C.E. AND OTHER SOLVENTS: Regardless of whether these solvents are in the new form or in a used form, there are problems in transporting and delivering them. I personally witnessed a tank truck delivering trichloroethylene to an industry at which time I noted T.C.E. leaking profusely from two flanges underneath the truck. The truck driver had placed two 5-gallon buckets under the running board to try and collect the majority of the leakage but most of it was running down the driveway toward a storm sewer drain. Less than 1,000 feet away, we had drilled a 50' deep test boring and found the groundwater to contain an excess of 500 ppb T.C.E. This kind of sloppy handling of trichloroethylene was going on long after the newspaper headlines had made everyone aware of the carcinogenic danger of T.C.E. The delivery of new chemicals is probably the clean side of the job. Getting rid of the waste product is often handled by far less scrupulous persons and is a great deal more difficult to control.

EPA ROLE IN THE NORTH PENN PROBLEM: I was very impressed with the caliber of people who handled the problem in the North Penn area. EPA did a very effective job of investigating sources, sampling and educating Authority personnel. There were two areas I feel improvements could have been made: (1) The extreme length of time it took PA. DER and EPA to get into gear and start taking over the investigation. (2) Lack of EPA Lab facilities. It takes too long to obtain EPA Lab results and the Lab cannot handle the required volume. (As a result NPWA was forced to spend over $12,000 for lab analysis at private labs). This is not meant as a criticism of EPA as I understand their lab facilities are very limited. It merely points out the need for additional laboratory facilities or additional contract services. Often the quickness of reaction time is of utmost importance in identifying a pollutor.

WHAT IS THE AUTHORITY CURRENTLY DOING: The Authority is continuing with its own investigation in an effort to tie down T.C.E. pollution sources. (2) The Authority has on order a 100 gallon per minute granulated activated carbon (GAC) treatment plant which is to be installed on a polluted well sometime in September (3) The Authority has applied to EPA for a Federal Grant to study the air lift method of simultaneously pumping water and removing T.C.E. in conjunction with resin adsorption polishing units. It is envisioned that a 50 gallon per minute pilot plan will be constructed. The Authority has received promises from various local manufacturing firms for partial funding or equipment donations in lieu of funding. We would be hopeful to have this project funded in fiscal 1981. (4) The Authority is continuing to work with pollutors, EPA & PA. DER in an effort to clean up sources of pollution.

LEGISLATIVELY, WHAT IS NEEDED: We firmly believe that super-fund type legislation is needed to handle the type of pollution problem where the pollutor cannot be readily located. Cost of clean-up shold be financed by a tax on each pound of chemical sold. If the pollutor is eventually located the fund could be reimbursed. The important thing is that aquifers be cleaned up quickly and the burden of clean up not wind up on the shoulders of innocent thrid parties.

We do not feel Government should mandate the type treatment water utilities may use for removal of organic chemicals. We feel this stifles innovation. Granulated Activated Carbon, for instance has been suggested as panacea treatment method for removal of all organics. We recognize the effectiveness of GAC on many organics but several chemicals found in North Penn Water Authority water are not readily removed by organic carbon but are effectively treated by other means. EPA should not mandate one particular method of treatment. We would, however, suggest that EPA concentrate efforts on establishing MCL's for various compounds, in researching new methods of treatment and cleaning up sources of pollution.

CONSTRUCTION GRANTS PROGRAM: I do not feel that that a construction grants program similar to the waste water grants program is necessary for the water works industry. Outright grants to water utilities for construction of facilities would not lead to efficient use of funds. Most utilities should be able to provide safe water and finance improvement projects from their own rates except in unusual circumstances. Federal Funds should be reserved for cleaning up unusual pollution problems, basic research and new technology demonstration projects.

IN RETROSPECT: Looking back over the past year, I see several strategical errors that were made in the handling of the Trichloroethylene groundwater pollution problem. The limit of 4.5 ppb probably was set too low. From the standpoint of public reaction and public relations between a water utility and their customers, it is much easier for utilities to advise their customers that a previously established government standard has been reduced to a lower number because increased evidence has shown a certain chemical to be hazardous.

It is however, very difficult for a utility to go back to their customers and try to explain that what we once thought was hazardous we now find is not quite so bad, therefore, we're going to give you higher doses of a particular organic chemical. The public reaction to this second set of circumstances is one of disbelief. The public believes the problem is too expensive and therefore we are sacrificing their lives for dollars. It would make a great deal more sense if a temporary limit were established at a somewhat higher level; then require all utilities to monitor for the suspected hazardous chemical, analize the results and have some idea of the magnitude of the problem. This would also allow sufficient time for additional research on methods of treatment, the degree of toxicity of the particular chemical and time to educate utility personnel. If additional data showed the limit should be reduced, the public would readily understand. In the meantime EPA and various state and local agencies could concentrate on eliminating the most serious high level sources. This procedure is particularly true in the case of

of carcinogens where the effect is a long term one. Of course, when an imminent hazard exists, immediate action should be taken. As a point in fact, I suggest there are still many utilities in Pennsylvania who have not checked their water for organic chemical contamination.

SUPPORT OF H.R. 4509: The North Penn Water Authority supports the major provisions of H.R. 4509 and the American Water Works Association statement before the committee on June 9, 1980. I would pay particular attention to the portion of P.L. 93-523 which requires the administrator to issue regulations for the control of any substance which may have an adverse effect on the health of persons. The longer I spend on this planet the more I find that everything we do and everything we eat, drink or breathe has an effect on us. What affects one person or one segment of the environment adversely may affect another segment positively. Unfortunately we must deal in degrees of risk. There is no such thing as zero risk. We therefore support the language in H.R. 4509 which would require EPA action when a substance poses an unreasonable "risk".

For reasons I stated above, the Authority concurs with the AWWA suggestion that EPA set performance standards rather than speficying treatment techniques.

I appreciate the opportunity to appear today and will be pleased to answer any questions the members may have.

Mr. FLORIO. Thank you very much.

Mr. Hang, I would like to ask you to briefly summarize what you think the appropriate action is that the Congress should undertake to deal with this problem. The gentleman just talked about more research that is highly desirable in terms of determining what the health hazards are, what the proper concentrations are. Let us assume that we get to be able to objectively determine what the proper concentrations are above which we should not permit people to drink water, and we find that a good portion of our supplies are beyond those concentrations, what is it that you would suggest, if anything, to deal with the problem of contamination?

Mr. HANG. Well, clearly you have to have, in a sense, a two-prong approach. No. 1 is as this gentleman has pointed out, we do not know much about the ability to take out the toxic chemicals from the water once they are already there. In other words, we already have very many contaminated raw water supplies. What we have to do, is find out the kind of treatment technology that can take care of organics.

Mr. FLORIO. I think the point that was made was we are not even yet to the point to define what is contamination. There is obviously some dispute as to whether something is contaminated for purposes of being unhealthy. That might be the first point. The second point might be yours, that you are raising now, when we do determine what the contamination is we are not sure how to go about purging or cleaning up.

Mr. HANG. Right. Well, let me first say that the Safe Drinking Water Act says do two things, set maximum contaminant levels, where possible, for the organics, but recognizing that this is a very difficult kind of process and because there are many, many organics that are in the water, the Safe Drinking Water Act also gives EPA authority to describe treatment technology to take out the toxics. So right now, even though EPA has tried to get granular activated carbon filtration technology installed in certain communities, that has not happened, and certainly that needs to be tested. That whole area needs a major commitment of resource dollars.

Mr. FLORIO. Because there is a feeling in a lot of areas, clean air and so on, that EPA in describing what the appropriate technology or methodology is to deal with the pollution problem, whatever it is, is perhaps not the best way to go, that rather EPA, this bubble concept in the Clean Air Act should say you industry, you water company, have to get things to this point of purity, do it however you can, you make the determination as to how you are going to get it there but get it there.

Mr. HANG. EPA has the kinds of resources that would allow a thorough investigation of that kind of treatment approach. Now, for example, if you ask New York State to do that, which is the agency that I am familiar with, there is no way that they could do that because they do not have the dollars, they do not have the expertise. Only EPA really has that ability concentrated within their organization and they should be relied upon to make sure that that happens, plus they have the funds for it.

Mr. FLORIO. The suggestion has been made that industry has the ability to do that more effectively. We are talking about the water companies, we are talking about industry, whether it is chemical

companies; and that they in the sense have more expertise than EPA, have more resources than EPA, that EPA should be the public guardian of purity of air and the quality of water, they should undertake the determination as to what constitutes those protective limits and then tell the industry people do it, however you do it, but you have to do it.

I am wondering what your thought is as to that approach.

Mr. HANG. I do not think that the water industry in America has really taken the kind of aggressive preventative approach to heart. For example, in Europe, many water authorities have already used granular activated carbon filtration for several decades with a high level of effectiveness. I understand that in some cases they installed technology at no added cost to the consumer. In America when EPA proposed that the technology be installed, many water authorities banded together and fought that and managed to kill it, and that is how come we do not have granular activated carbon treatment plants all over America acting as a preventative barrier. Many of the organics have little taste or odor and none of the water supplies are tested for a broad spectrum of toxics, organic chemicals on a continual basis. A supply could become contaminated, people could be exposed to the toxic chemicals and no one would ever recognize that problem until, say by accident, some monitoring was done and they suddenly discovered trichloroethylene or some other compound and then upon further investigation they found many more organics.

Even on Long Island right now, only about eight organic compounds are monitored for on a continual basis, no broad spectrum analyses have been made, so they have identified eight compounds but in all likelihood because the industries on Long Island discharge many organics this contamination is probably far more serious and I think that is a good example of the kind of problem we are up against.

Mr. FLORIO. What would your response be if the water works industry stated that we have a better way of dealing with the problem in the filters, the carbon filters, and that we can measure up to the same standards, give us the legislative authority to go our way, as long as we measure to the same standards. Would that be satisfactory?

Mr. HANG. I think the process which we have now is very open and I know that EPA constantly solicits my feedback on a particular proposal and I know that they get that same feedback from the various water purveyors and from the various industries. So certainly if a good idea comes up I do not think that they are going to say, well, we are not going to consider that because we are dead set on GAC. I think when a new approach comes up and when it is shown to be effective they will respond to that, but again we have not gone through that kind of review process and one of the main reasons that we undertook our study is because we said we have just gone through a decade when we have passed all these major pieces of legislation, the Safe Drinking Water Act, Clean Water Act, the Clean Air Act, and what we need to do is to find out how well these programs are working and discover whether or not they are effective, and that is why we did the study and now we have to respond to the kind of concerns that our group has found and make

appropriate changes in a midstream sense for years to come, and certainly there has not been enough attention on controlling industrial waste water discharges, there has not been enough concern on hazardous waste management, and obviously, as has been discussed by many people here today, drinking water quality is being jeopardized as a result of that inaction.

Mr. FLORIO. Do you want to add a point?

Mr. BORCHERS. I want to say with regard to the carbon treatment, we have one well where we found an organic chemical that would not readily come out. We found, in 2 weeks it went through the carbon. So carbon is not necessarily the panacea of all water treatment. It gets rid of it relatively easily by aeration, for instance. There are literally hundreds of people in the water works industry working on their own little scheme or idea to try to figure out different ways of treating these things. There are companies spending a lot of money and I think what they are going to come up with eventually is many of them will wind up using carbon, but you would stifle the innovation if you just said you must use what the Government says. I say the Government should pick the Government standards and we better live up to them and there should be good reason for them.

Mr. FLORIO. You are saying the performance standard approach should be perhaps a more effective approach?

Mr. BORCHERS. Do the research and recommend to the little guy we think you ought to put carbon in it, do not cram it down his throat if he has come up with something better.

Mr. FLORIO. Gentlemen, thank you very much. We have a time limit, we have to be out of here by 1:45 p.m. We have one more panel. Thank you very much. I appreciate your testimony.

Our last panel consists of Ms. Jacqueline Warren of the Environmental Defense Fund, and Mrs. Merilyn Reeves, natural resource coordinator, League of Women Voters. Ms. Warren, your statement will be entered in the record in its entirety and you may proceed. [See p. 149.]

STATEMENTS OF JACQUELINE M. WARREN, STAFF DIRECTOR COUNSEL, ENVIRONMENTAL DEFENSE FUND; AND MERILYN REEVES, NATURAL RESOURCE COORDINATOR, LEAGUE OF WOMEN VOTERS

Ms. WARREN. I am Jacqueline Warren, I am a staff attorney with the Environmental Defense Fund and I have been working on the Safe Drinking Water Act since 1973. We were quite active in getting the Safe Drinking Water Act passed by the legislature and have watched EPA's implementation from the very beginning. We brought a lawsuit against the agency in 1975 for their failure to address organic chemicals in the first interim regulations. I am going to skip through my testimony very quickly. A lot of the points I was going to make about the problems of contaminated ground water have been brought out by other witnesses. The main point I think to be made is that the problem of organic contamination is not a surface water problem, as it was always assumed to be. We are learning every day in newspaper stories from places around the country that wells and ground water are contaminated

with organic chemicals at concentrations that are orders of magnitude greater than the levels that are being found in surface water.

It used to be assumed that ground water was protected just because it was ground water, and now we know that is not a valid assumption.

The other main point that has to be kept in mind when efforts to solve the ground water contamination problem are considered is that it is not good enough merely to set standards and measure until the standards are exceeded. Once that happens, the ground water is gone. It is too expensive to think of pumping out wells, treating the water and then putting it back in. EPA is certainly on the right track with their efforts to establish a preventive strategy for protecting ground water. The RCRA statute is also going to help in terms of new hazardous waste facilities by trying to make sure that new sites do not result in the kind of contamination we have seen from existing sites.

But that is not going to solve all the problems. For one thing, a lot of RCRA regulations are tied to the safe drinking water standards which include only 16 substances at this point. With the exception of the trihalomethanes standard recently promulgated by EPA and a handful of pesticides and herbicides, organic chemicals are not covered by the drinking water regulations. EPA was asked earlier today whether they had the authority to control ground water contamination from surface impoundments, whether the Agency has adequate authority to deal with that problem, and the statement was made the problem can be handled to some extent under the NPDES permit program. EPA has consistently taken the position that the NPDES program and the Clean Water Act do not apply to ground water except in the rare instances where the nexus between the ground water and surface water supply can be established very carefully.

I do not know whether EPA is changing their position now. From our point of view, the one shortcoming that still exists in the national environmental laws is the protection of ground water. We believe that a nondegradation standard is the only approach that is really going to help, by preventing contamination through the regulation of land use activity, industrial activities, and other such activities in critical aquifer recharge areas.

Mr. FLORIO. You can appreciate, of course, the difficulty of trying to do that when people argue that nondegradation effectively prevents anything from happening, construction of a road, can be interpreted as providing for inducement for development which ordinary road use will result in degradation.

Ms. WARREN. I understand the arguments but nondegradation has been a well accepted concept for surface water. For example, many water companies have watersheds that supply their drinking water source. Such watersheds are protected from contamination by restrictions on the activities that may be conducted on the land. For ground water such restrictions can vary. The most restrictive requirements need only apply to certain specific areas of the aquifer, the critical recharge areas. If that area is protected it does not matter that an activity that appears to be harmful is carried out directly above the aquifer, since that may not be the central recharge area through which contamination is going to pass. Fifty

percent of the country relies on ground water for their drinking water. I think we may have only seen the tip of the contamination iceberg so far. As I said before, we have only to read the paper any day in order to see wells from Maine to California having very serious contamination problems. State officials in Michigan, for example, say a third of the wells in the State may be beyond use for drinking water. They are talking about beyond use for maybe centuries.

I do want to make some points about the Gramm bill which is before the subcommittee but which has not been commented on by very many witnesses today. The real essence of the Safe Drinking Water Act is its preventive approach, preventive in this sense means not waiting until people are actually sick, and it has been documented conclusively that hazardous substances in the water are causing human disease. The Safe Drinking Water Act is preventive in giving EPA the authority to establish standards when there is a reasonable basis to believe that the concentrations of contaminents that are being measured in drinking water may be posing a threat of adverse effects on health. The basic change that the Gramm bill would make would delete that preventive approach, change the tense to the present tense, and establish an unreasonable risk standard. The unreasonable risk standard now exists in the Toxic Substances Control Act, it is in the pesticide law and, it is in the food and drug law. Under those laws, the decisionmaker is weighing tangible benefits of certain products against the risk posed by their use. To me that is distinctly different from the problem of involuntary exposure to organic substances in drinking water. The benefits are not measurable in the same sense.

The law as it is written now requires the Agency to consider the cost of various corrective measures, and to that extent benefits are considered. But, to say that the Agency must now do rigid cost/benefit studies before putting out any regulations, and base all those regulations on hard factual data means that we are going to be counting the bodies in the streets before we ever regulate many of 700 chemicals now being identified in drinking water. We already know that 22 of those contaminants are carcinogenic, and some 30 are suspected of being mutagenic. Most of them have not been tested, however. Leading cancer scientists and other health experts around the country have come forward and said that concepts of preventive health protection are consistent with the sort of approach that is embodied in the Safe Drinking Water Act, and in the approach EPA has taken toward regulating organics.

It is difficult for me to understand why such far-reaching amendments, which appear to weaken the Safe Drinking Water Act so dramatically, are being proposed at this time, a time when the country is up in arms about contaminated wells. To weaken the Agency's ability to act in emergencies or to set standards to control exposure to toxic substances in drinking water, to change the basic regulatory approach from prevention to reaction only after the harm is established, as I say, is difficult to understand. Those of us who have watched EPA implement this program, would hardly call the Agency overly aggressive or guilty of abusing its discretion. Indeed, 6 years after Congress established the preventive approach in the Safe Drinking Water Act, we have only a handful of stand-

ards now. We have only one organic standard, the trihalomethanes, which was promulgated after a lawsuit by EDF. The water supply community, which from the beginning has not recognized that there are health hazards from organic chemicals in drinking water is suing EPA over that standard. In fact if you go back to the legislative history of the Safe Drinking Water Act, the House committee report spells out in great detail studies made of State programs for drinking water quality. There was a clear record that the States, with some exceptions, in general had not acted aggressively to protect the public against contamination in drinking water. It was this failure by the States, which prompted the passage of the Drinking Water Act in the first place.

The figures are quite impressive. Of 969 systems that were studied in the 1970 survey of State water supply programs, 56 percent of them had physical deficiencies in the protection of the ground water sources and in disinfection capacity; 77 percent of the plant operators were inadequately trained; 79 percent of the systems were not inspected annually by State or county authorities; and 90 percent of the systems covered had no idea what the chemical quality of their water was. If you think that this is a problem of the past, consider that during the past year drinking water wells in Toone, Tenn., were investigated by the Tennessee Department of Health, which announced that there was no bacteriological contamination in them. The reason was that carbon tetrachloride levels in the wells were so high the bacteria had been killed. The State health department did not look for carbon tetrachloride. It was only after EPA came in that the carbon tetrachloride problem was discovered. From coast to coast, when people travel around the country, they are entitled to the same safe drinking water everywhere. They may get high quality water in States that are concerned about the problem, like New Jersey, but they are not necessarily going to get it in other States whose resources are limited, or which have their priorities focused elsewhere.

Many of the provisions of the Gramm bill seem designed to make it more difficult for EPA to regulate contaminants in drinking water. For example, I mentioned earlier the requirement that rigid cost/benefit analysis be undertaken for every regulation. Even the Toxic Substance Control Act, which has the unreasonable risk standards in it, specifically states that formal cost/benefit analysis is not required. Consideration of costs is necessary, but there is no requirement that benefits and cost be given a quantitative value. For regulation in the public health area, especially in areas that are really on the frontiers of science, it is very difficult to put a meaningful quantitative value on human life, on disease, or on the value of the deteriorated or completely contaminated water supply. It would make it much more difficult for EPA to move in this area. It would also increase the amount of litigation, because the procedural requirements are so specific and so technical. Even though they copy to a certain extent amendments put in the Clean Air Act in 1977, that act has some safeguards in it to make sure that otherwise valid rules will not be overturned merely because of a minor procedural failures on the part of the Agency. Those safeguards are not in the Gramm amendments.

Another aspect of the Gramm bill which has caused us some concern has to do with the deletion of the authority to prescribe treatment techniques. The 1974 Safe Drinking Water Act makes it very clear that where it is either prohibitively expensive to monitor for individual contaminants, or where it is technologically impossible, EPA has the authority to go to a treatment technique instead of a maximum contaminant level. Such a requirement would remove or reduce the contaminants without having to measure for several contaminants. For example, one way that communities are able to save money in their monitoring is to monitor for coloform count in the water. That is used as a surrogate for other bacteria in the water. Instead of looking for every individual virus or every individual bacterium, if you exceed a certain level of colorform, you disinfect. That is a treatment technique.

That kind of approach was proposed by EPA for synthetic organic chemical contamination. It has also been talked about as a way to reduce the asbestos levels in drinking water. It seems to me that merely because there has been strong opposition to EPA's proposal to require use of treatment as effective as granular activated carbon, is not a valid basis to delete the EPA's entire ability to prescribe a treatment technique for contaminants in drinking water. That is tantamount to throwing a baby out with the bath water. I agree with the statement made earlier that in EPA's proposed organics regulation they did not say utilities must put in activated carbon. What they are saying is if a water system can demonstrate that there is another technology which will achieve the same control as carbon, or be even more effective, the system may go ahead and use that other technology. We agree with that. I know there are problems with prescribing a specific technology that must be used. A performance standard is probably a better approach that way the agency is saying, "You get to the level, we have specified. Get there anyway you want to, but demonstrate that you are achieving the level required." That seems to me a perfectly feasible approach. But to say we are all going to start monitoring for more than 700 chemicals, although even now we do not know about the toxicities of all 700, and they are thought to be only 10 percent of the organics in drinking water, I believe that we are all going to be dead for a century before the quality of drinking water is improved. In the meanwhile we will continue to have very heavily contaminated drinking water, if the approach taken under the Safe Drinking Water Act is amended in the way proposed in the Gramm bill.

EPA's authority to act in emergencies is also being cut back under the proposed amendments in the Gramm bill. Right now EPA can act in cases of substantial and imminent danger, but the Gramm bill would put a 24-hour limit on emergency orders, and would also require the EPA Administrator to initiate a civil suit and only issue the administrative emergency order in a case where a civil suit was not practical to bring. Even then the 24-hour limit would still apply unless the court extended it in the context of a given emergency situation. Generally such emergencies will continue for more than 24 hours, and details of putting together briefs, and getting to court entail more than 1 day.

It seems to me that the proposal in the Gramm bill is really an unwarranted interference with the EPA Administrator's ability to act in an emergency. The fact of the matter is that EPA has involved its emergency authority under the Safe Drinking Water Act only once in the 6 years since the act was passed. That incident involved a very serious carbon tetrachloride spill into the Ohio River. Even in that one case, the Agency went to court, they did not issue an administrative order. Again, it seems to me that handicapping the Administrator's ability to act in emergencies is a reaction on the part of some people who are concerned about the way the drinking water program is being implemented, but it is not based on concrete evidence of abuse of discretion by the agency. The major concern of our members is that people must continue to receive the greatest possible protection against contaminants of drinking water especially in emergency situations involving hazards which are known or suspected of causing adverse effects on health.

Taken together, the series of amendments proposed by Mr. Gramm would drastically undercut both the preventive aspects of the Safe Drinking Water Act and EPA's ability to act to protect and enhance the quality of drinking water. The amendments would also return a large degree of control to the States in the area of control of underground injection of oil and gas development wastes, by assuming that State programs, merely because they exist, are therefore adequate. In effect, this would make EPA prove that a State program is not adequate. I think this would be a great setback in the effort to achieve effective programs by the States in the drinking water area.

I would like to point out again that even though drinking water was an area of traditional State authority, studies showed that the States did not do the job and that is why the Safe Drinking Water Act was passed in the first place. The record shows some States are moving to protect drinking water but most are not. As a result, there remains a need for uniform minimum standards, established at the Federal level, which the States may adopt for their programs. The precedent of assuming State programs to be adequate, even if they have not been shown to be enforceable or adequate, seems to me to bode ill for a lot of other environmental programs which we fought very hard to get, and which also require State implementing programs that have to be at least as stringent as Federal standards.

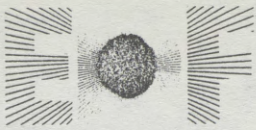
For all of these reasons, I would urge the committee to give serious consideration to these amendments before enacting them, and in effect to work with a scalpel rather than with a hatchet. If the exemption authority is to run out in 1981 and this is a burden on small systems, then extend the exemption authority. But don't go ahead and gut the Safe Drinking Water Act in the name of lessening Federal regulation. We strongly oppose that and I would urge you to give it serious consideration before doing so. The problem of contaminated drinking water is not diminishing. It is a problem the magnitude of which we are only beginning to appreciate now, and we need strong Federal authority to deal with it. State representatives sat here today and said they do not have enough money to solve our drinking water problems. In light of

this, EPA certainly needs to be able to do as much as it can to advance the achievement of safer drinking water across the United States.

Mr. FLORIO. Thank you very much.

[Testimony resumes on p. 170.]

[Ms. Warren's prepared statement follows:]



STATEMENT OF

JACQUELINE M. WARREN

ENVIRONMENTAL DEFENSE FUND

BEFORE THE

HOUSE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE

SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT

August 22, 1980

The Environmental Defense Fund (EDF) is a non-profit environmental organization with approximately 45,000 members who are dedicated to seeking scientifically sound solutions to the nation's environmental problems. Since its inception in 1967, EDF has been involved in administrative, legal, legislative and educational efforts to control involuntary exposures to toxic and especially to cancer-causing chemicals in the environment. EDF staff members worked for passage of the Safe Drinking Water Act and have actively followed EPA's implementation of the statute since that time. Throughout, EDF's primary concern has been that serious contamination problems, evidenced by widespread discoveries of measurable levels of hazardous organic chemicals in drinking water, were not being addressed by water suppliers across the country.

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OFFICES IN: NEW YORK, NY.; NATIONAL HEADQUARTERS: WASHINGTON, DC; BERKELEY, CA; DENVER, CO

To date, more than 700 organic chemicals, such as vinyl chloride, carbon tetrachloride, dieldrin, trichlorethylene, chloroform, kepone, PCBs,and benzene, have been detected in our nation's drinking water supplies. Although the National Academy of Sciences has identified as carcinogens 22 of the chemicals found in drinking water,[1/] and many others are known to be mutagenic or otherwise toxic, the vast majority have not yet been tested to determine their toxicity. Moreover, it is estimated that the 700 chemicals represent only a small fraction, perhaps as little as 10% of the organic chemicals present in drinking water.

Organic chemical contamination of drinking water has generally been considered to be primarily a problem of surface water supplies. However, recent information has revealed that many groundwaters are also highly contaminated by synthetic organic chemicals such as trichlorethylene and tetrachloroethylene, often at levels that are orders of magnitude higher than those found in drinking water taken from surface supplies.[2/]

The sources of chemical contamination of surface drinking water supplies are well known. They include industrial discharges, spills and accidents, urban and agricultural runoff, municipal sewage effluent, and chlorination of drinking water and sewage

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1/ Drinking Water and Health, NAS, 1977, p. 49.

2/ A Groundwater Protection Strategy: Appendices, EPA, Washington, D.C., Government Printing Office, 1980, Ch. IV. See also Toxics on Tap: Chemical Contamination of Long Island Drinking Water Supplies, New York Public Interest Research Group, Inc., 1980.

for purposes of disinfection. Recent efforts to ascertain the sources of groundwater contamination have produced an equally lengthy list: disposal of industrial wastes in landfills, pits, ponds, and lagoons; septic tanks and cesspools - and the chemicals used to clean them; municipal waste water; mining activity; petroleum exploration and development; and agricultural, street and urban runoff.

Contrary to the longstanding assumption by water supply officials and others involved with drinking water quality, that groundwater is protected from contamination by industrial and natural wastes, there is now rapidly accumulating evidence that serious chemical contamination of groundwater is widespread. Indeed, every day the newspapers seem to contain another discovery that wells have been rendered unfit to drink from because improper hazardous waste disposal or industrial activity in an aquifer recharge area has resulted in dramatically high concentrations of toxic or carcinogenic organic chemicals in the water. Such problems have been widely reported in New England, New York, New Jersey, Tennessee, Michigan, Wisconsin and California, as well as in numerous other States. Because of the prevalence of such reports, there is serious concern at all levels of government about the long-term viability of our groundwater resources as a drinking water supply.

Because groundwater lacks the self-cleansing properties of surface water provided by circulation and aquatic organisms,

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it may remain contaminated for decades, centuries or even millenia. Thus, contamination of groundwater is, for all practical purposes, irreversible by natural forces. Because groundwater is so very vulnerable to chemical contamination, expensive to monitor, and extremely difficult, if not impossible, to clean up, there is an urgent need for preventive measures to preserve the pristine quality of our remaining unpolluted groundwater sources. Furthermore, since fifty percent of the U.S. population relies on groundwater as their primary source of drinking water, the seriousness of this problem cannot be over-emphasized.

To the extent that future contamination can be prevented by enforcement of requirements for proper disposal of hazardous waste under federal and state programs developed pursuant to the Resource Conservation and Recovery Act (RCRA), one major source of groundwater contamination may gradually be eliminated. Most of the other sources are unlikely to be remedied in the near future, however, nor will contamination from existing inactive or abandoned waste sites be easily abated.

To illustrate the potential magnitude of only one aspect of the problem, a recent EPA survey of 176,647 surface waste impoundments showed that 95% of the sites were not being monitored for groundwater contamination, and that 70% of the impoundments were unlined.[1/] Moreover, thirty percent of the unlined industrial

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1/ Lyle Silka and F.M. Brasier, The National Assessment of the Ground-Water Contamination Potential of Waste Impoundments, EPA, June, 1980.

impoundments "overlie usable aquifers and are underlain by unsaturated zones which freely allow downward movement of any liquid wastes escaping from the impoundment."[1/] Thus, both the extent and the number of groundwater contamination incidents can be expected to increase in the foreseeable future. Unfortunately, we may only have seen the tip of the iceberg so far.

It is now painfully apparent that the quality of our drinking water supplies, surface and groundwater alike, are either already seriously contaminated in many locations throughout the country, or else are in danger of becoming contaminated at any time. Many of the chemicals being found in drinking water are known or suspected carcinogens and mutagens, and many others are structurally similar to the known "bad actors," and are therefore likely to prove positive when they are tested. Thus, the need is greater than ever before for the protection and prevention of injury to health that Congress intended in passing the Safe Drinking Water Act.

As H.R. 6090 comes before this Subcommittee for consideration, EDF urges that the integrity of the preventive approach embodied in the statute not be undermined. We are hopeful that the overriding precautionary intent of Congress, which was stated repeatedly in the Committee Report and the debates, will remain uppermost in the minds of the members as the various amendments are debated. We believe that the preventive approach of the SDWA is a valid one

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1/ Silka and Brasier, supra at 5.

and should be preserved. As a matter of policy, it resolves uncertainties in favor of protecting public health rather than placing the public at continuing risk. The alternative, waiting until the link between disease and consumption of chemically-contaminated drinking water is proved conclusively, is contrary to accepted preventive health philosophy and will impose a social cost in terms of human pain and suffering which would be unconscionable.

EDF believes that many of the provisions of H.R. 6090 would drastically change the regulatory approach and objective of the Safe Drinking Water Act. Not only would the statute be transformed from a preventive to a reactive, after-the-fact-of-harm regulatory authority, but EPA's ability both to establish requirements for controlling drinking water contaminants, and to act in emergency situations, would be greatly diminished.

One wonders why such far-reaching amendments, which appear to weaken the law so dramatically, are being proposed at this time. Surely it is not because EPA has done too much or abused its authority under the Act. As those of us who have watched the Agency's glacial progress in addressing the problem of organic chemicals in drinking water are well aware, it took an EDF lawsuit and a change in Presidential administrations before any meaningful action on organics was initiated. Even now, six years after Congress directed EPA to move expeditiously to establish

uniform national standards for drinking water in order to provide maximum feasible protection of public health, EPA has promulgated only a very few Maximum Contaminant Levels for organic chemicals and other contaminants of drinking water.

EDF recognizes that EPA has been somewhat handicapped by the lack of federal funds to help communities meet the primary drinking water regulations, and that the opposition of the water supply community to requirements for control of organic chemicals has been very strong. Nevertheless, the public is currently spending $400-$500 million dollars every year for bottled water and home water filters, both of which are expensive and questionably efficacious alternatives, because they are afraid to drink the often malodorous and bad-tasting chemical soup running out of their taps. Given the evidence of contamination, and the public demand for better quality drinking water, EDF does not agree that weakening EPA's ability to act effectively to protect public health against hazardous substances in drinking water is an appropriate legislative response to the problems we are facing.

The Safe Drinking Water Act was passed in 1974 largely in response to widespread national concern about the extensive presence of organic chemicals in drinking water supplies across the United States. In addition, studies of public water supply systems presented to the Subcommittee showed that there were great variations across the country in the quality of drinking water and water treatment practices. As set forth in the House Report

on the Safe Drinking Water Act,[1] 56% of the 969 systems studied evidenced physical deficiencies in protection of groundwater sources, and disinfection capacity; 77% of the plant operators were inadequately trained and most systems were unprotected against contamination from sewage cross-connections; 79% of the systems were not inspected annually by the state or county authorities; and 69% did not even analyze for half of the contaminants listed in the U.S. Public Health Service's Drinking Water Standards. In addition, surveillance of drinking water quality was so poor that 90% of the systems covered in EPA's Community Water Supply Study "had no idea what the chemical quality of their drinking water was."[2]

The House Report also noted other widespread problems increasing the potential health risk from drinking water, such as "lack of adequate training and certification procedures for water supply operators, lack of adequate, inexpensive monitoring or measurement methods, the proliferation of small water systems which cannot support well-trained full time operators and necessary equipment, inadequate health effects research, and the increasing demand for drinking water at a time of increasing pressure to dispose of contaminants in ways that may endanger the quality of

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1/ H.R. Rep. No. 93-1185, 93rd Cong., 2d Sess. 5-6 (1974) (hereinafter "House Report").

2/ House Report at 7.

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1/ H.R. Rep. No. 93-1185, 93rd Cong., 2d Sess. 5-6 (1974) (hereinafter "House Report").

2/ House Report at 7.

drinking water."[1/] On the basis of such evidence that neither the States nor local water authorities were uniformly providing safe drinking water, Congress enacted the Safe Drinking Water Act.

There is no question that the clear intent of the law was to initiate expeditious action by EPA, the States and public water systems to protect the public against known and potential hazards in drinking water. The essence of the preventive approach of the Act is contained in the definition of national primary drinking water regulations, which specify "contaminants which, in the judgment of the Administrator, may have any adverse effect on the health of persons...".[2/] As the House Report explained,[3/]

> The words used by the Committee were carefully chosen. Because of the essentially preventive purpose of the legislation, the vast number of contaminants which may need to be regulated, and the limited amount of knowledge presently available on the health effects of various contaminants in drinking water, the Committee did not intend to require conclusive proof that any contaminant will cause adverse health effects as a condition for regulation. Rather, all that is required is that the Administrator make a reasoned and plausible judgment that a contaminant may have such an effect.

Even though the effects of carcinogenic and mutagenic chemicals may not become manifest for decades after exposure, Congress recognized that there was and is an urgent present need to reduce the levels of such compounds in drinking water. If

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1/ House Report at 7.

2/ §1401(1)(B), 42 U.S.C. §300f.

3/ House Report at 10 (emphasis in original).

regulations were withheld until the danger was conclusively demonstrated, i.e., until people were shown to be dying of cancer because of carcinogens in drinking water, untold injury to public health could result. For this reason, Representative Paul Rogers, former Chairman of the Subcommittee on Health and the Environment, emphasized during the debate on the Act that " we cannot afford to wait 20 years for health effects research to be completed to begin controlling contaminants which there is some basis to believe endanger public health."[1/]

This approach is consistent with other precautionary legislation, such as the Clean Air Act and the Clean Water Act, with basic concepts of preventive medicine, and with the judgment of scientific experts that exposure to carcinogenic chemicals in drinking water poses a risk of increased cancer incidence in humans. Indeed, Dr. Arthur C. Upton, former Director of the National Cancer Institute, has stated that:

> Additive or more than additive effects from multiple exposures to an array of organic carcinogens in water are of such significance as to warrant an appraisal of the opportunity for magnification of the total carcinogenic burden which may be tractable or controllable by water processing to reduce the levels of total exposure. * * * In the interest of cancer prevention, it seems prudent to control exposures to carcinogenic contaminants in drinking water.

1/ 120 Cong. Rec. H10793-4 (daily ed. Nov. 19, 1974).

2/ Statement of Dr. Arthur C. Upton, EPA Hearings on Control of Organic Contaminants in Drinking Water, Washington, D. C., July 12, 1978.

EDF therefore urges the members of this Subcommittee to give the most careful consideration and scrutiny to H.R. 6090 before adopting amendments which would eliminate the emphasis on protection of public health which is central to the Safe Drinking Water Act in its current form.

EDF's Specific Comments on H.R. 6090

The proposed amendments to the Safe Drinking Water Act contained in H.R. 6090 would make major and extensive changes in the existing law. Not only would the bill effectively eliminate the preventive regulatory approach to drinking water which was specifically intended by Congress when the statute was enacted, but it also appears to shift to the public the burden of bearing the risk of exposure to potential hazards until they have been demonstrated by quantifiable evidence of human illness and death. Thus, the bill reflects throughout a significantly reduced concern for the protection of public health than does current law. The following comments briefly describe some of EDF's concerns about the effect of the proposed amendments on future protection of the public against hazardous substances in drinking water.

1. The definition of primary drinking water regulations.

As mentioned previously, the essence of the Safe Drinking Water Act's preventive regulatory approach is embodied in the definition of a national primary drinking water regulation in §1401. Section 3 of H.R. 6090 would change this definition from contaminants

which "may have any adverse effect on the health of persons" to contaminants which "pose an unreasonable risk to the health of persons." Not only does this change to the present tense effectively repeal the precautionary nature of the Act, but the substitution of the "unreasonable risk" standard would require that the public be subject to serious hazards before the EPA could act to reduce the danger. Since under §3 an unreasonable risk must arise before mitigating action could be initiated, the public could not be protected until the level of exposure and the likelihood of harm became "unreasonable."

EDF acknowledges that the unreasonable risk standard is applicable to regulation of pesticides, drugs, commercial chemicals and consumer products. In such cases, there are tangible benefits to be weighed against the risks of use of such products. In the case of involuntary exposure to contaminants in drinking water, however, there are no benefits in the same sense. Moreover, the social cost of permitting the exposure to continue can be a human health disaster twenty years hence. Weighed against this is the dollar cost of compliance with a primary drinking water regulation, which under current law must be feasible in terms of both technology and cost before it may validly be promulgated.

Section 2 of H.R. 6090 would also require the Administrator of EPA to conduct a rigid cost-benefit analysis of each regulation, although such a requirement could seriously undermine the safe

drinking water program. The conceptual, ethical, and methodological difficulties associated with attempts to quantify intangible benefits such as health and life have been discussed at length by the National Academy of Sciences,[1] the General Accounting Office,[2] and the MIT Center for Policy Alternatives,[3] among others. Perhaps the problem was best articulated by former Chairman Paul Rogers when he stated:[4]

> There is a movement...which says that efforts to improve our citizens' health must be cost-beneficial. That we must show that the price of preventing ill health and disease and death does not cost more than if we had not made the effort. In other words, if getting sick is cheaper, then maybe we should not try to prevent illness. We must not allow such a brand of bogus economics to deter us from our goal of improving the health of our people and the environment which contributes to their health.

The Safe Drinking Water Act requires that the Administrator of EPA consider costs when primary drinking water regulations are developed. The Agency's record in implementing the Act shows that the Administrator has done so in every case. There is no good reason why rigid application of cost-benefit analysis, which could diminish EPA's ability to protect public health against myriad hazardous substances in drinking water, should be required by law.

1/ NAS, Principles for Evaluating Chemicals in the Environment (1975).

2/ GAO, Report to the Congress: An Executive Summary - 16 Air and Water Issues Facing the Nation, October 11, 1978.

3/ MIT Center for Policy Alternatives, Benefits of Environmental Health and Safety Regulations, Report to the Senate Committee on Government Affairs (1980).

4/ Speech to the National Coalition for Disease Prevention and Environmental Health, November 15, 1978.

Even the Toxic Substances Control Act (TSCA), which contains the unreasonable risk test as a regulatory standard, does not require EPA to conduct formal cost-benefit analysis. On the contrary, the House Report on TSCA states clearly that "the balancing process described [in the Report] does not require a formal benefit-cost analysis under which a monetary value is assigned to the risks associated with a substance and to the cost to society of a proposed regulatory action on the availability of such benefits. Because a monetary value often cannot be assigned to a benefit or cost, such an analysis would not be very useful."[1/] EDF strongly opposes the inclusion of such a requirement in the Safe Drinking Water Act and urges the Subcommittee not to adopt it.

2. Deletion of the authority to prescribe treatment techniques.

Section 4 of H.R. 6090 deletes the Administrator's authority to prescribe a treatment technique in lieu of a maximum contaminant level under any circumstances. Even where monitoring for individual contaminants would be prohibitively expensive or technologically impossible, EPA would be required to meet the stringent requirements for establishing a maximum contaminant level or else do nothing. Congress' original intent in providing the authority to prescribe treatment techniques was clearly stated in the following examples included in the House Report:[2/]

1/ H.R. Rep. No. 94-1341, 94th Cong., 2d Sess. 14 (1976).

2/ House Report at 12.

> One example of a group of contaminants for which monitoring might be judged to be infeasible would be viruses, which are currently prohibitively expensive to isolate and measure on a routine basis. Therefore, the Committee expects that the Administrator would prescribe all known treatment techniques for controlling viruses rather than establishing a maximum contaminant level for viruses. A second example might be as follows: where several specific contaminants occur within a general group, the cumulative expense of monitoring for each individual contaminant might similarly lead to a judgment that such contaminants are ones for which treatment technique regulations should be prescribed.

Certainly, these considerations are still relevant and applicable to our existing drinking water contamination problems. To eliminate the treatment technique authority because of dissatisfaction with EPA's now withdrawn proposal to require water utilities to treat organically-contaminated water at least as effectively as with granular activated carbon filtration would be tantamount to throwing the baby out with the bath water.

Instead of eliminating EPA's authority to prescribe treatment techniques - an authority that EPA can hardly be chastised for using too aggressively - the Subcommittee should be enhancing rather than radically reducing the Agency's ability to cope effectively with drinking water contamination problems. If the treatment technique authority is to be amended, EDF suggests that the restriction of its availability only to cases of economic or technological infeasibility be deleted. If this change were made, EPA would be able to prescribe a treatment technique requirement where the Administrator found that the public health would

be more effectively protected than by a number of maximum contaminant levels. EPA should also be able to prohibit or limit the use of water treatment practices that may be of greater risk than benefit to health, such as the use of water softeners.[1/] To achieve the basic and still valid objective of the Safe Drinking Water Act, which is to protect public health against adverse effects from contaminants in drinking water, EDF urges that the Subcommittee give serious consideration to the adoption of strengthening rather than weakening amendments such as that described above.

3. Weakening of EPA's authority to act in emergency situations.

Section 9 of H.R. 6090 would amend §1431, the emergency powers section of the Safe Drinking Water Act, to restrict EPA's ability to respond promptly and effectively to protect public health. Among other things, emergency orders could only be issued "where it is not practicable to assure the prompt protection of the health of persons solely by the commencement of a civil action." In addition, such orders could only remain in effect for 24 hours unless extended by a court.

1/ As pointed out by the National Academy of Sciences, a number of studies have indicated a correlation between increased incidence of heart disease-related deaths and soft water. If there is in fact a causal connection, the NAS concluded that "we are confronted with a major public health problem and current water treatment practices will have to be greatly modified." NAS, Drinking Water and Health, 1977, p. 440.

EDF strongly opposes adoption of this provision as an unnecessary and unwarranted interference with EPA's authority to protect public health in emergencies - in cases where drinking water contamination poses an "imminent and substantial endangerment" to public health. The 24-hour time limitation also appears arbitrary and unrealistic, given the realities of assessing the magnitude of an emergency, considering possible solutions, initiating a court action, and similar exigencies. In addition, the amendment provides for no exceptions to these absolute rules regardless of the particular circumstances, the severity of the threat, or the extent of the burden imposed by the order.

The House Report contains the following explanation for the inclusion of emergency authority in the Safe Drinking Water Act:[1/]

> Section 1431 reflects the Committee's determination to confer completely adequate authority to deal promptly and effectively with emergency situations which jeopardize the health of persons.

In light of the fact that this section has only been invoked once in the six years since the Act was passed,[2/] there can be no valid argument that EPA has abused its authority. To handicap EPA's ability to protect the public in cases of emergency threats to the safety of drinking water therefore appears unjustifiable.

1/ House Report at 35.

2/ The emergency involved a major spill of carbon tetrachloride in the Ohio River and affected drinking water supplies in Cincinnati and other nearby communities.

The public is entitled to continue to enjoy the better, prompter and more effective protection in emergencies that is provided by present law.

4. Procedural amendments

EDF does not support certain of the procedural amendments contained in §2 of the bill because we believe their adoption would severely hamper EPA's ability to promulgate health protective drinking water regulations under the Act. As active participants in every EPA rulemaking initiated so far to implement the drinking water program established by the Safe Drinking Water Act, EDF can attest to the openness and ample opportunity for comment and criticism provided by the present law. Certain of the proposed amendments would place significant new procedural burdens on EPA and are thereby likely to interfere with protection of public health.

For example, while stringent procedural requirements would apply to agency rulemakings, no safeguards are included to assure that minor procedural rulings could not be the basis for overturning an otherwise sound rule. Moreover, as discussed earlier, the requirement of a formal cost-benefit analysis, based on "factual data," will greatly undercut the preventive aspects of the Act. This is because adverse human health effects resulting from exposure to numerous organic chemicals cannot be demonstrated by hard evidence until harm has occurred. Hard facts are simply not available where

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the evidence of potential harm comes from animal experiments or statistical associations shown by inherently inconclusive epidemiological studies. EDF does not believe that such requirements will advance reasoned decisionmaking by EPA to any measurable extent, but protection of public health will certainly be slowed, if not prevented entirely, in the process.

5. Other comments on H.R. 6090

EDF has a number of other reservations about H.R. 6090. We are concerned about provisions in §§1 and 7 which run counter to the clear need for effective protection of groundwater. For example, §1, dealing with changes in the Underground Injection Control provisions of the Safe Drinking Water Act, appears to assume that State rules and UIC programs will be adequate to protect groundwater. No showing or determination to that effect is required to be made. In addition, the degree of protection for groundwater is reduced from the assurance in present law that underground drinking water sources "will not be endangered by any underground injection" (§1421(b)(3)(C)) to a requirement of "reasonable" protection in H.R. 6090. Finally, the apparent assumption that any State program, no matter how inadequate or poorly enforced, is to be presumed satisfactory unless proven otherwise, is not justified by past history. Such a precedent bodes ill for achievement of the hard-won goals of other federal environmental programs whose implementation depends upon effective and enforceable State programs that are at least as stringent as the federal requirements.

EDF is also extremely concerned about the proposals to suspend the interim primary drinking water requirements for barium, radium and fluoride pending further health effects research. Not only would the public in the areas affected be left unprotected against the known adverse effects of exposure to these contaminants while the studies are being conducted, but suspension would be effected regardless of the feasibility of compliance with the existing standards by particular systems. EDF would prefer that greater use be made of the exemption provisions of §1416 of the Safe Drinking Water Act than that across the board suspension of the standards be legislated. To this end, EDF supports amendment of the Act to provide EPA and the States with the necessary flexibility to grant such exemptions.

The Safe Drinking Water Act was Congress' response to the failure of the States and local water systems to recognize that America no longer has "the best water in the world." It was an effort to initiate meaningful steps at all levels of government to begin remedying the national problem of contaminated drinking water. Although EPA has moved only slowly, traditional water supply authorities in many cases had moved not at all to protect public health, which is why Congress passed the Act in the first place. In the intervening years, local water systems have continued to do very little to address the problem of organic chemicals in drinking water, although their opposition to EPA's somewhat belated efforts has been quite vigorous. For this reason, EDF believes that the need for a strong federal drinking water law is at least as great as in 1974, if not greater.

The Safe Drinking Water Act represents a well-conceived effort to ensure that the basic right to safe drinking water is enjoyed by everyone in the United States, no matter where they live. We therefore urge the Subcommittee not to amend the Act in a manner which will defeat its underlying preventive purpose.

Thank you for this opportunity to express EDF's views on pending amendments to the Safe Drinking Water Act.

STATEMENT OF MERILYN REEVES

Ms. REEVES. Mr. Chairman, it is a privilege for me to be here to represent the League of Women Voters. The league is a citizen education and political action organization composed of over 1,350 local leagues in all 50 States, the District of Columbia, Puerto Rico, and the Virgin Islands. The league has been concerned with water resources and water management for over 20 years. I think about 30 years ago when the League of Women Voters became interested in water, people believed that water, running water purifies itself. We have learned a lot since then and experts knew much before that time we now have many people out here who erroneously believe that well water is always safe because there are layers of soil that filter out their impurities and the well my grandfather dug is the well that is sweet and pure, just as good today as it was when my grandfather first dug it, and the League of Women Voters is attempting to conduct educational campaigns across the country to help to alert the public to the fact that we can no longer rely that the water under that ground is safe and is pure.

Ninety-six percent of rural America depends on water, ground water, as its drinking water source. Those individual wells out there, they are not tested, they are not monitored, they are not regulated, and the people assume that the water is safe. One-half of this country's population uses ground water as its chief drinking source. This is something that we strongly believe must be emphasized again and again. Ground water contamination is very sinister because it is so gradual, it occurs over a long period of time. The plume of pollutant we are not sure where it goes, it is very difficult to collect, to detect. It spreads its poison, and only when the damage is done do we discover it. Very small quantities have been known to do great damage. For example, in Western Minnesota, during the grasshopper outbreak in the 1930's, they put out arsenic bait in order to control the grasshoppers. About 50 percent of that arsenic bait was not used, it was stored there at the State fairgrounds for a while, then put into an old warehouse. It was cleaned and put in the back of the lot, 50 pounds of it, in 1972, an industry established a site, dug a well, shortly after going into business and his employees, 11 of the 13 working at this site became hospitalized with arsenic poisoning, 2 of them are hospitalized, 13 of the 13 were ill, they found 3,000 milligrams per liter of arsenic in the well. The drinking water standards for arsenic are 500 milligrams per liter, .05, and in Canada, drinking water standards for 5,000 milligrams per liter .005 and they found 3,000 to 12,000 milligrams per liter.

So our members are learning that ground water once it is contaminated it is very difficult to do anything about. You generally close the well, forget about it and, we believe this is a resource in which we cannot just close the well and forget about it. We believe that EPA must have quality resources and legal authority to deal with this problem and there are many existing gaps. One of the first deals with the problem of cleanup. The superfund will go a very long way to help fill the existing gap in this area. The League of Women Voters strongly supports the Superfund legislation.

Another gap deals with the area of recharge. There is some existing law through the 208 planning process which has attempted

but in no way solved the problem. The recharger, we are going to be looking at very carefully as EPA is developing its national ground water strategy this fall. We are going to be reviewing those proposals carefully.

We support continued funding efforts for the development of assessment and monitoring capabilities for determining and predicting the moving and transportation of a combined water contaminant, information and scientific data need to be made available to local and State governments to assist them in the development of ground water management plans, and we believe that providing this kind of technical assistance is a very clear Federal responsibility.

We believe that there must be adequate resources available to EPA to insure that their strict enforcement of present laws, such as RCRA, Safe Drinking Water Act and TOSCO, because all of these can provide some degree of ground water protection.

Another gap that is very clear, which we are very pleased to hear that you are working on, is in the area of far greater emphasis on recycling, reuse and reduction of all present substances which are considered to be waste. There is a gap in Federal encouragement in this area. Another area that we would like to point out which has come up here is the role of the Federal Government in the protection of drinking water. We believe there has to be a strong Federal role working in cooperation with State and local governments. Water at the local level is really quite cheap. It is taken for granted by local utilities. They generally do not have adequate financial resources to maintain the plants they have. Operation and maintenance is a key local problem. It is because local officials do not want to have to raise the rates and have the jurisdictions that the taxpayers in the area descend upon them in a body, we believe there has to be a strong Federal role in the protection of drinking water. And that one of the concerns about the Gramm bill, because we feel that this is one proposal which weakens at a time when we do not believe that we should see a weakening of any proposals for safe drinking water. We would like to point out that once public confidence is lost, particularly as it affects drinking water, we may never ever be able to regain that public confidence. There is public confidence at the present time that drinking water is safe, maybe it is not, but there is a feeling of public confidence about this. We believe that it is very important that this be maintained. We believe that now represents an opportunity to insure that future generations are going to enjoy that cool spring like drink of well water, which is unadulterated with chlorine, aluminum, or other expensive chemicals. We believe protection of ground water, which is now safe for drinking is not a luxury but is a necessity, and we believe that the Federal Government has a responsibility to prevent future contamination of this vast resource. Thank you very much.

[Testimony resumes on p. 179.]

[Ms. Reeves' prepared statement follows:]

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TESTIMONY BEFORE THE

SUBCOMMITTEE ON TRANSPORTATION AND COMMERCE

AND THE

SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT

OF THE

HOUSE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE

ON

HAZARDOUS WASTE AND DRINKING WATER

BY

MERILYN REEVES, ENVIRONMENTAL QUALITY DIRECTOR

LEAGUE OF WOMEN VOTERS OF THE UNITED STATES

AUGUST 22, 1980

I am Merilyn Reeves, Environmental Quality Director of the League of Women Voters of the United States (LWVUS). I am pleased to be here today to present the League's views on the importance of protecting our groundwater resources from contamination. The League is a citizen education and political action organization composed of over 1,350 local Leagues in all 50 states, the District of Columbia, Puerto Rico and the Virgin Islands. The League has been concerned with water resources and water management for over twenty years. We supported passage of the Safe Drinking Water Act, the Clean Water Act, the Resource Conservation and Recovery Act, and the Toxic Substances Control Act. Many of our local and state Leagues are actively involved with hazardous waste and clean water issues and have conducted educational

projects or testified specifically for protection of groundwater resources. In some instances League concerns have focused on groundwater supplies and the rapid depletion of water tables. An increasing number of Leagues are now conducting educational programs and testifying on issues relating to the growing problems of groundwater contamination.

Years ago it was thought that running water purifies itself. Today there are many who just as erroneously believe that well water is always safe because layers of soil filter out the impurities. Groundwater is not immune to contamination; the filtering capacity of the soil is neither infinite nor all-inclusive. Recent studies clearly indicate that groundwater is being contaminated by a variety of chemicals and other hazardous wastes, some of which are known carcinogens. Serious thought must be given to the protection of this vital resource before it is too late. Unfortunately, in some towns, it already is too late. For example, a little over two years ago, the town of Bedford, Massachusetts was forced to close down all of its wells after dioxane, trichloroethylene and 1,1,1 trichloroethane were discovered in the drinking water. As of January 1980, the community was still buying water from outside sources and there is no indication this situation will improve. New wells are not always easy to locate and cleaning up contaminated wells is extremely expensive.

Nearly one-half of this country's population, including 96 percent of rural America, depends on groundwater as a drinking water source. This water is seldom tested and there are few governmental programs which monitor the safety of wells. How many toxics are in that water, in what quantities, and how dangerous are they?

Although there is little evidence of massive contamination of groundwater, the threat is so real and the examples so serious that we believe there must be greater governmental emphasis on protection efforts.

Groundwater contamination is so sinister because it is gradual and so difficult to detect. Toxics slowly seep into groundwater, spread an insidious poison across a wide underground area and contaminate wells of unsuspecting families. Often it is not until after the damage has been done--when a community's wells are closed and health effects have been manifested--that we discover a nearby lot or farm has been used as a chemical dumping ground and that these chemicals have leaked out and found their way into the water supply.

According to Eckardt Beck, Assistant Administrator for the Office of Water and Waste Management, Environmental Protection Agency (EPA), 44 communities in Massachusetts found their water supplies to be severely contaminated with synthetic organic chemicals; over 200 wells in California, 24 in New York, 25 in Connecticut and Pennsylvania have been contaminated by chemicals. How many other contaminated wells exist that have not yet been reported or even detected?

In a paper by Wayne A. Pettyjohn, a geologist with Ohio State University, a number of examples from Europe and the United States are cited which illustrate how disposal practices of ten, twenty, and even fifty years ago have resulted in groundwater contamination which has only recently been discovered. For example, according to Pettyjohn, concentrations of arsenic, used as bait to control grasshopper infestations in the middle and late 1930s in western Minnesota, were discovered in

wells in that vicinity in 1972, some 40 years later! What will our children and grandchildren be finding in their wells 40 years from now? As Beck stated at the oversight hearings on the Safe Drinking Water Act in June of this year,"...we have seen the tip of the hazardous environmental iceberg of the eighties. Love Canal and the Valley of the Drums are dramatic precursors of revelations yet to come."

One of the principal causes of groundwater contamination is the land disposal of waste, especially chemicals. Although land disposal has historically been seen as a cheap and easy alternative, we are now becoming aware of its dangers and its effects on groundwater. There have been many documented cases of groundwater contamination by leaching from improper disposal sites. For example, in Jackson Township, New Jersey, leachate from one landfill resulted in the closing of 100 surrounding wells. EPA estimates replacement of the water system here may cost $1.2 million, and this doesn't include costs of damages suffered by affected individuals. In 1974, 148 wells in Dover Township, a New Jersey suburb, were closed due to chemical contamination of groundwater by 6000 drums of liquid chemical waste. Preliminary estimates show that the immediate costs resulting from the incident are over $400,000. This cost figure includes the extension of the public water supply to the area, 20 new wells drilled to a deeper aquifer, interim emergency water for the area residents and sampling and analyses of water. Litigation costs, costs of removing waste from property, and salaries for professionals working on the case are not included in the estimate.

In 1979, monitoring wells were installed at the site of an abandoned municipal dump in Black River Falls, Wisconsin. The groundwater and nearby wells were

contaminated. Cost estimates to properly close the dumpsite ranged from $25,800 to $50,000.

EPA's series entitled Hazardous Waste Disposal Damage Reports cites case after case of groundwater contamination. In its 1979 Report to Congress entitled Waste Disposal Practices and the Effects on Groundwater, EPA also explored groundwater contamination from disposal practices and the impacts on drinking water supplies. The Congressional Research Service issued a catalogue in March of this year, Resource Losses from Surface Water, Groundwater and Atmospheric Contamination, which also points the finger at poor waste disposal practices as a major source of groundwater contamination in a number of cases.

The most important thing to remember about groundwater is that once it is contaminated, it is very difficult, if not impossible, to clean up. Unlike surface water, groundwater's natural self-cleansing properties are very limited and, as the examples have shown, in most cases of contamination the well must be shut down. In some cases, efforts have been made to treat and restore groundwater quality after contamination, but the treatment techniques are generally complex, time-consuming and very costly.

EPA must have power to protect groundwater. There are federal laws and state programs, but these existing authorities have many gaps. The LWVUS supports prompt enactment of the proposed Superfund legislation, which would fill in some of the existing gaps by giving EPA the authority and resources to clean up abandoned

waste sites, to promote speedy action and to impose liability on the polluters. We believe that 1) fees should be levied on industries to provide money for the fund rather than using government revenues, 2) strict, joint and several liability should be established for all those who cause or contribute significantly to a release of hazardous materials, and 3) spills of hazardous materials and oil should be included in the bill's jurisdiction in addition to releases from hazardous waste disposal sites.

Of equal importance to abating damage caused by groundwater pollution is the need for a greater federal commitment to prevent the contamination of our groundwater resource. We oppose the weakening of the Safe Drinking Water Act by amendments such as the Gramm Bill, HR 6090. Now is the time to strengthen protective legislation, not weaken it. This includes strengthening the recently promulgated underground injection control regulations. EPA will decide this fall how to regulate wells that inject hazardous waste above underground sources of drinking water. In the May 19 Hazardous Waste and Consolidated Permit regulations, the Agency banned the operation of wells that inject hazardous waste directly into underground sources of drinking water. The LWVUS submitted comments supporting the strengthening of these regulations by prohibiting the operation of hazardous waste wells that inject above as well as directly into underground sources of drinking water. As countless cases have demonstrated, leakage from land disposal sites above aquifers have resulted in the same severe contamination experienced when wastes are injected directly into the water.

We are pleased that EPA is developing a national groundwater protection strategy and we will carefully review its proposals. We support continued federal efforts for the development of assessment and monitoring capability for determining and predicting the absorption, movement and transformation of groundwater contaminants. Information and scientific data needs to be made available to local and state governments to assist them in the development of groundwater management plans; we believe providing this technical assistance is a clear federal responsibility. There must be adequate resources available to EPA to ensure that there will be strict enforcement of RCRA, SWDA and TSCA, all of which can provide important groundwater protection. We also believe there must be a far greater emphasis on recycling, reuse and reduction of all present waste substances.

Finally we now have an opportunity to ensure that future generations can enjoy a cool sparkling drink of well water which is unadulterated with chlorine, alum, ferric chloride or other expensive treatment chemicals. Protection of groundwater which is now safe for drinking is not a luxury, but a necessity. The federal government has a responsibility to prevent contamination of this vast resource.

Mr. FLORIO. Mr. Gramm.

Mr. GRAMM. Thank you, Mr. Chairman.

Ms. Reeves, I appreciate your comments. I am sorry that you don't support my proposed rewrite of the Safe Drinking Water Act, but in an democratic process we believe that people have a right to disagree. I guess really that is the essence of what H.R. 4509 is about. It simply says that when there is a clear danger that EPA has powers to impose mandatory controls on local water systems, local water systems that are in general publicly owned, publicly operated and supervised by locally elected officials.

Where we have run into problems in this country, however, has been where local waterworks have controls imposed on them by EPA that are No. 1, not necessary, and that, No. 2, that the possible benefits were in no way commensurate with the costs.

So, what I have sought to do, as it relates to drinking water itself, is just simply say that the burden of proof is on EPA when EPA wants to mandate controls on a local system. And the great paradox here is that unlike most areas of Federal intervention, water for drinking, underground water is not in general an item that flows in the interstate commerce to any significant extent.

We have had witness after witness from local water systems, from everywhere from Houston to Fallon, Nev., who have basically said I drink this water, my children drink this water, and administrators of EPA in Washington don't, and we believe that these added costs are not justified, and EPA cannot demonstrate on an evidence basis that they are.

What I have argued, if they can't, they should be able to give information to local citizens, but ultimately they should make the decision.

I would like to just ask you if you don't believe in the democratic process strongly enough, that you believe that local people ought to have the right in gray areas to make the ultimate decision?

Ms. REEVES. Mr. Gramm, we have a strong feeling about the role of the State and local governments in terms of protection off something as precious as drinking water. I think in terms of responsibility of the Federal Government, however, the role for EPA has been made very clear by the Congress, that they also have a responsibility to insure protection.

Certainly the problem that you are describing is, as I understand it, in the courts at the present time and that the courts will probably determine whether or not there has been an unreasonableness on the part of EPA in the case of the THM and organic chemicals and treatment levels and what is being required.

We don't feel, however, that this should be cause for the amending of the law. We do not believe that there has been sufficient impropriety or certainly bad faith demonstrated, that EPA has gone out of its way, in other words, to not carry out the mandate Congress has given it.

The Safe Drinking Water Act has been one of the Federal acts that many of us believe EPA has been rather slow to implement and so it is very difficult for us at this point in time to see why there should be an amending of that act now, and this is one of the reasons that we oppose this.

Mr. GRAMM. Well, it seems to me, of course, there is a difference between being slow and being capricious. One of the problems we have with the existing law is it brings in language that triggers regulations, when in the opinion of the administrator a substance may pose a potential danger. Local operators, locally elected officials, the National Association of Counties, the National Association of Public Utility Commissioners, basically made up of elected officials, have asked that this be changed to give them more precise meaning what falls within the general categories of legislation, such as OSHA, where the EPA has defined unreasonable risk.

I think the key issue, and it is certainly one that we can disagree on, is that when there is doubt as to potential danger, who should decide, the people that are drinking the water and their elected officials, or bureaucrats over whom they have no real control, who they feel are imposing costs on them that are no way offset by benefits.

I would like to also point out one other thing. That is, you talk about people having confidence in the safety of their water. I think they do. But that confidence was not generated by a Federal program.

As you said yourself, EPA has been very slow with implementing controls. This confidence was in fact generated by local programs.

Ms. REEVES. But loss of confidence will come from the inaction of those local utilities, either because they do not have the resources or because they will not properly set the rate in order to give them the funds that they have to have.

We know in the waste water area, in which the treatment of waste drinking water, a very large percentage approaching almost 50 percent of the plants, failed to operate properly. We know that in the drinking water area, we have very many outmoded drinking water utility systems in this country, in which there needs to be a push for the upgrading of those facilities. It is difficult for that push to be initiated on the local level when there are pressures for tax dollars to be used for this, that and the other.

There are TRIM proposals to cut back on Government spending, and it is very easy to just let the common idea, well our drinking water is safe, it has always been safe. Of course, we never tested tested for it. We don't know for sure if it is safe, but we have a lot of trust in it.

I think my main concern is that, yes, local utilities have had a great responsibility and in every instance where we have had problems it is because local utilities failed in that responsibility, in the manner in which they had the funds, not because they did it on purpose, but because there was not adequate resources on which to do this.

The Federal Government has a very distinct role in this. Our drinking water, when one travels across the country, our citizens should have the expectation that the water that we drink in North Dakota and the water we drink in California and the water we drink in Florida will not make us sick, and that we have some national standards, and this is the role that we see as the Federal Government role.

Mr. GRAMM. Well, let me conclude, Mr. Chairman, by saying that in this case we have a clear difference in opinion. I believe that the

people who are drinking the water, the children who are drinking the water, unless EPA can demonstrate that there is danger, that those people love their children more than Mr. Kimm does, that those people have a greater vested interest, and I think I have readily conceded that when there is unreasonable risk that EPA should be able to enter, even if these people chose to bear the risk. However, in so many areas, uncertainties and lack of information are being used as a springboard for expansion of Federal power.

We have earlier stated in testimony that literally thousands of people at the turn of the century were dying as a result of water that wasn't fit to drink or bathe with. That is almost unheard of today as a result of State and local action, not Federal action.

The Federal Government did not build the safe drinking water standards of this country and I think that our difference is not an objective, I don't think anybody wants us to have inferior water. The question is, how do we go about it and who should make the decisions.

The final point is I don't see anything wrong with taking into account how much things cost. If local government tends to do less in an area then the Federal Government does, I don't think that necessarily indicates that local government is wrong. It might indicate that because we are talking at one level and spending on another that there is not a clear balancing of costs and benefits.

At a time when people are finding it difficult to pay for their groceries, at a time when a person who makes $8,100 of taxable income is in the 21-percent tax bracket, then I think in every area we need a better balancing, and I think that, at least I believe and I choose to believe on the basis of my perspective, we are looking at the same facts, that the unwillingness of local government to undertake many projects that the Federal Government leaps into because of pressures the local government faces with financing, is a clearer indication of the will of the people than it is the action of the Federal Government.

Ms. WARREN. I am Jackie Warren with the Environmental Defense Fund. You weren't here for my testimony. I wanted, if I might, to speak to a couple of points that you made. We had this same debate 6 years ago, the same basic States rights issues were debated, and Congress made a judgment at that time that based on the record of the States, a Federal drinking water law was needed. You raised the question of people dying because of waterborne disease problems with the drinking water. Well, people did die, and we discovered that if we disinfect the water we can eliminate waterborne diseases.

Mr. GRAMM. By "we" do you mean local water authority?

Ms. WARREN. Right, but since World War II there has been an explosion of the petrochemical industry in this country, and they have discharged their waste into the Nation's surface water and they have buried their hazardous wastes underground.

Local water authorities have consistently taken the position that we have the best water in the world because we chlorinate and we disinfect. They argue that trace levels of organics in drinking water aren't a problem. They say, "When you can show there is a real problem, then we will do something about it."

The problem I have with that approach is it makes the public bear the risk of waiting 20 years to prove there is a hazard. Then 20 years from now we will say, we should have done something about this 20 years ago. EPA now has 18 epidemiological studies that demonstrate a statistically significant association between consumption of organically contaminated surface water and chlorinated water, and increased cancer incidence. These studies don't prove it, but the statistical association is there.

We also know that many of the chemicals found in drinking water are carcinogenic in laboratory animals. People who do cancer research on animals do it, not because they are worried about the health of animals, but because they think testing on laboratory animals tells us something about the potential cancer risk in humans.

On the basis of that kind of evidence, the EPA has moved to control the level of organic chemicals in drinking water. We have supported that effort because of the epidemiological studies, and the evidence of contaminants in the water all over the country, and the fact that several of those contaminants are known to be carcinogenic. Cancer scientists who testified in EPA's lengthy proceedings on the organics proposal said that they perceive a real risk of increasing cancer incidence in human beings unless the levels of organics in drinking water are reduced. It is a question of how much evidence you really want before taking action, and who bears the risk of waiting to find the answers.

Mr. GRAMM. First of all, I have consistently argued in H.R. 4509, which is cosponsored by almost 100 Members of Congress, that where there is an unreasonable risk—and again that exists in many of our environmental safeguards—that EPA would have the power to intervene.

Contrary to your studies concerning carcinogens in the water, in most of the areas where there is current dispute between the Federal Government and local government, we are in a range where there is no scientific evidence which demonstrates a clear relation.

We had the head of the waterworks, which is publicly owned, from Fallon, Nev., who sat right where you are sitting, who testified before this subcommittee, EPA has given them the evidence concerning a very, very low-level trace of arsenic in their water. It is not caused by any petrochemical refinery, it has always been in that water. EPA cannot demonstrate that it has had any impact. Things that are normally identified with arsenic in no way are present in their population. Their level of mortality and morbidity in no way shows a deviation.

The people of Fallon, Nev., took a vote on whether or not they wanted to spend the money that was involved in taking arsenic, very, very small traces, out of their water, and they voted by a 20-to-1 margin not to do it.

So I am just afraid when you talk about forcing the public to bear the risk, here is a clearcut case of where the public has chosen to bear the risk rather than to bear the expense. It seems to me that we are protecting people against what we define as their ignorance by saying in those cases where EPA can prove a danger

we force them to do it, even against their will, we deny them their freedom in those cases.

But in the cases where they can't prove it, they can't demonstrate that there is a problem but yet they want to mandate controls, personally I am not very persuaded by overriding a 20-to-1 vote of local people. They have chosen to bear the risk rather than the expense.

Ms. WARREN. I don't know how to respond to that. I don't know how representative those people are. I don't know what amount of knowledge they were working with, or what kind of epidemiology had been done in the community to establish that there was no risk. But I do know that the peoples' representatives only 6 years ago said that they wanted a preventive approach to drinking water, and they didn't want to wait 20 years while health effects data are accumulated on some of these compounds before acting to protect public health. In fact, the actual danger to health may never be conclusively proven. Yet, Congress in the Safe Drinking Water Act decided that we should act to protect public health even without conclusive proof.

I also disagree with some of the other testimony given here today. I don't think the public has such great confidence in the quality of our drinking water. People are currently spending $500 million every year for home water filters and bottled water. I think the Safe Drinking Water Act is a vote of no confidence in the job that the States were doing to protect drinking water, and I know that local water utilities resented that at the time. The depth of their resentment was clear during the debates on the Act. They opposed giving standard-setting authority to the Federal Government, which was in effect Congress saying to State and local water officials, "You haven't done the job and therefore we are going to give the authority to regulate drinking water quality to the Federal Government."

I believe that a lot of the opposition that we see today to EPA's actions on drinking water has to do, to a certain extent, with the fact there are no Federal funds to help pay for compliance with EPA's standards. I have had people from the waterworks community say to me, off the record, that the situation would be quite different if there was Federal money. Yet, the anticipated costs, EPA's cost estimates for compliance with their organics proposal, were $7 to $26 on an annual consumer's water bill. From where I sit, that looks like pretty cheap insurance.

Mr. GRAMM. I think there is no doubt about the fact if you would have the Federal Government pay, in my hometown, we would be willing to have the Federal Government pay, we would meet any standard they would pay for, because that means new jobs in our community. We would be glad to have them. The point is the money that comes from the Federal Government is not free money.

We denied in this committee funding for research into spinal injuries because of the budget constraints. That research might have lifted a very heavy burden from literally thousands, maybe millions of Americans. So that money we spend in treating things that may or may not be harmful can be used for things that might be beneficial, and it seems to me that any society has got to do some balancing. I agree 6 years ago the Congress leaped very

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deeply into this, but I think that the mood of the country has changed.

I hope the chairman will indulge me just a little longer. I had to think when we had the people from EPA up here, that the people in my district I guess are pretty representative, had they had a vote they would have voted for the Safe Drinking Water Act. But yet had they been here and had they listened to this testimony, and had they looked at what has happened in terms of regulations in our State and our district and our community, they would vote to fire all these bureaucrats.

People are a little bit schizophrenic, they want the control, they want protection, but they don't want the bureaucrats, and they don't want to be told what to do.

I readily admit that there is a great paradox there and it is trying to hit a happy balance that I am seeking to do, not to weaken our control, but to be rational so EPA can deal with some of these other problems rather than devoting resources to things that may or may not have advantages. I see so many problem areas like hazardous waste dump sites and cleanups where there is a clear benefit, and I wonder by spending money and imposing money on local government if we are not making a mistake.

Thank you, Mr. Chairman.

Mr. FLORIO. Let me conclude by first of all thanking both of you for your testimony, and for the record, just expressing my high admiration for the gentleman from Texas, but to say that my experience has not been the same as his. I have not been privy to the previous health hearings when local officials came and apparently indicated satisfaction with the local situation and opposed to the need for intrusion or assistance, depending on how you define it, from the Federal Government.

Although I will say that the axis from Houston, Tex., to Fallon, Nev., is not surely as representative as it could be, if that is the scope of the local officials, that your Transportation Committee's experience is experience that was reflected today, and I would hope the gentleman gets an opportunity to look through the record because the State officials who testified today in a sense, were pleading for Federal assistance in defining the standards so that they could implement programs in accordance with some nationally set objective standards.

Their biggest criticism was that the Federal Government in the person of the EPA had not done what it should have done over the last number of years in defining the standard so appropriate safeguards could be enacted.

So I am sympathetic to what the gentleman is talking about, but think on balance, that the situation today as opposed to the situation 6 years ago, almost requires that there be more active intervention in terms of a national ground water policy than there was 6 years ago when we did not have the foggiest notion as to the extent of the problems that we now know about, and can pick up the newspapers each day and read about.

Ladies, I appreciate your comments. Thank you very much.

The hearing is concluded. We stand adjourned.

[The following statements were received for the record:]

STATEMENT OF PENNZOIL COMPANY
BEFORE THE INTERSTATE AND FOREIGN
COMMERCE COMMITTEE'S SUBCOMMITTEE ON
HEALTH AND ENVIRONMENT

Pennzoil Company appreciates the opportunity to submit its written comments concerning the affects of the Environmental Protection Agency's (EPA) Underground Injection Control Regulations (UIC) issued on the production of substantial oil reserves by enhanced recovery methods in the Appalachian Basin.

Pennzoil has been a leader in the development of modern and safe secondary and tertiary oil recovery processes in the Appalachian Basin. Our company understands the need to protect our nation's drinking water resources, while also encouraging the economic development of recoverable reserves of domestic high grade crude oil. Production by Pennzoil accounts for 20 percent of the oil produced in Pennsylvania, and 40 percent of the oil produced in both West Virginia and New York. In addition, we are a smaller, but still significant producer in Ohio.

The Appalachian Basin is a unique area in the oil and gas industry, as it is the oldest oil producing area in the world with many of the original wells still producing. Over the last 100 years, the 205,000 square miles of sedimentary rock in the Basin have produced over 3.5 billion barrels of the estimated 20 billion barrels of crude oil originally in place over the last 100 years. Pennzoil believes that at

least 30 percent, or 5 billion barrels, of the remaining oil in place could be eventually recovered. To date, more than 356,000 wells have been drilled in the Basin, yet in 1978 only 76 wildcat wells were drilled, confirming that this is an area left largely to enhanced recovery methods of production. In 1979, daily oil production was approximately 64,700 barrels per day of high grade crude oil. About 20,000 persons are directly employed in the production phase of the industry and 40,000 in the refining phase in Pennsylvania, West Virginia, New York and Ohio. The percentage of total acreage in these states which is under lease for oil and gas ranges from 16.6 percent in New York to 84.2 percent in West Virginia.

The Bradford Field at Bradford, Pennsylvania, is a good example of Appalachian Basin production. It covers 90,000 acres in northwestern Pennsylvania and adjacent New York. Almost a billion barrels of oil have been produced from the Bradford Field alone and twice that amount remains unrecovered today. Virtually all of the production from this field is associated with secondary recovery methods, with production averaging less than one barrel of high grade crude oil per day per well. We estimate that approximately 80,000 wells have been drilled here with well density often greater than one well per acre. However, since many of the wells were drilled in the late 1800's, records and physical evidence of many of the oil wells are obscure or non-existent.

Through secondary recovery, Pennzoil produces 800,000 barrels of crude oil per year from 3,200 wells and operates 2,570 injection wells in the Bradford Field. The producing sands range in depth from 700 to 2,200 feet. This crude is produced by water injection into the producing sands and has been successfully practiced since the 1920's. This represents approximately 30 percent of the production from the field.

The drilling and completion methods for wells in the Bradford area have not substantially changed in the last 100 years. This is hard rock country which has been heavily glaciated. The flat riverbed areas, made up of unconsolidated gravels and sands of shallow depths of up to 400 feet, furnish some drinking water, but the area's principal source of water is from impoundments. Numerous springs on the sides of steep mountains furnish limited amounts of water for isolated dwellings. Wells are drilled by cable tools and air rotary rigs. Standard procedure for drilling injection wells is to set approximately 20 feet of conductor pipe and 400 feet of surface casing through the alluvial sands. Pennzoil cements this surface casing at the base to protect against migration of fresh water into the wellbore. The hole is then drilled to the producing sand and the well "shot" or hydraulically fractured. Two inch injection tubing is then set on a packer at the top of the producing sand and cement spotted immediately above the packer to ensure its integrity. Most operators now follow this completion

practice; however, in the past, operators relied almost solely on the seal made by the surface casing against hard rock shoulder at the approximate 400 foot level to effectively seal off the fresh water.

Pennzoil believes that the present drilling and completion methods, aided by improved secondary and tertiary recovery technologies, can safely protect drinking water sources. Moreover, the major oil producing states have adopted effective regulations to insure such protection. Pennzoil is currently working with the State of Pennsylvania to develop state regulations that will give the state primacy and allow economic recovery of these reserves.

However, state regulations mandated by the UIC rules would force a departure from this present simple, yet efficient, drilling and completion program to one that would require numerous logs, additional casing, cementing procedures and monitoring. These regulations would have a significant effect on the economics of this type of production, without significantly enhancing the protection of underground water sources assured by present operating methods.

Since regulatory controls for casing and cementing at the time of drilling may not meet EPA's current criteria, the Appalachian area producers may be required to rework existing wells. Pennzoil estimates that this would cost more than $40,000 for each of its 2,570 injection wells in

the Bradford Field alone, or over $100 million, which could not be economically justified. If this happens, it would be an example of unwarranted expenditures resulting from the application of generalized nationwide rules to situations which they do not fit. Further, this large expenditure does not include the vast sums that would be required to locate, if possible, and reabandon by EPA's standards, thousands of ancient wells.

Moreover, the age of many of these wells results in the average daily production of less than one barrel per day per well in the whole Appalachian Basin. Although higher prices are allowed for crude oil produced from these stripper wells, the costs of secondary and tertiary production have continued to increase preserving the marginal nature of the operation. In other words, this is a "pennies" area, not a "dollars" area.

Consequently, the Federal UIC regulations could place potentially severe economic impacts on producers in the Appalachian Basin. It will not take much of an economic burden to make these operations unprofitable, thereby resulting in premature abandonment of substantial amounts of high quality crude oil reserves under present technology, and also slowing the development of new technologies.

For example, if the rigid requirements contained in these new regulations were to result in the termination of waterflood operations in the Bradford Field alone, the

production loss would be 8,000 barrels a day. This indicates to us the fallacy of EPA's estimate of a loss of production of only 13,000 barrels a day for the entire nation.

There can be no dispute that it is necessary to protect underground sources of drinking water. Pennzoil's completion and abandonment practices exceed the standards for the area and are constantly being upgraded. EPA has recognized that exemptions from the stringent regulations may be granted for hydrocarbon producing acquifers where they cannot now and will not in the future serve as sources of drinking water. However, the manner in which this "exemption" will be implemented is unknown because there exists a conflict within the regulations as to whether this results in an acquifer not being subject to regulation, or whether it merely gives the States the option of reducing the stringent permit requirements. If this exemption option is not exercised by a State, many of the EPA's requirements would not only impede existing operations but make future secondary and tertiary recovery of oil improbable, a result specifically prohibited in the Safe Drinking Water Act. The Safe Drinking Water Act provides that the UIC regulations shall not apply to oil and gas operations unless essential to assure that underground sources of drinking water will not be endangered by such injection. This premise that these regulations are essential to assuring safe drinking water has not been proven by EPA.

Pennzoil recognizes that Appalachia poses a special problem for Federal regulators because of the age of the production and dissimilarity with other areas. However, EPA's response to this challenge is to write off the area as a high risk to underground sources of drinking water yielding negligible energy production. In the regulations governing the technical requirements of the UIC program (45 FR 42472 at 42488, June 24, 1980), that is clearly stated:

> "It is anticipated that operators in Illinois and the Mid-continent and Appalachian areas will be affected to a greater extent than other operators because these areas are characterized by poor completion practices and a large number of abandoned wells. Since production from stripper wells in these regions is relatively low, the net effect of the regulations may be the closure of those wells which produce very small amounts of oil but are likely to be the ones having potentially the greatest adverse impact on underground sources of drinking water."

Pennzoil does not believe that this area can be so easily written off, since approximately 60,000 jobs and 65,000 barrels per day of domestic high grade crude are involved.

Instead, we believe that the fairest and most balanced response is the one before this Subcommittee, which would allow the respective states to solve their individual

problems. If they fail, EPA has the right and, moreover, should take corrective action to assure that the state properly protects its underground drinking water resources. A balance should be set in place that enhances safe drinking water, while also allowing for necessary oil production.

Most affected states have adequate programs to assure safe drinking water, and even those states are placing renewed emphasis on updating their regulations and enforcement. State regulators have a thorough understanding of local conditions and greater ability to move forward with rapidly advancing technology to improve and protect their state's water resources. States should not be required to start all over again with new and often ill-fitting regulations mandated by a rigid nationwide approach.

Unless Congress acts, states may be forced to discard their hard-won knowledge of their own resources and local conditions, as well as interrupt their on-going programs and the experience they have gained. Congress should act as quickly as possible, since states now have 270 days to submit UIC programs to EPA for approval. Following these UIC requirements will likely result in the adoption of further unnecessary, complex regulations before a state may qualify for primacy and federal grants. Pennzoil believes that State agencies should be given incentives to expand and strengthen their activities in this area, without these restrictive federal regulations.

Pennzoil respects and understands the need for reasonable regulations that will satisfy the goals of the Safe Drinking Water Act. Our company has and will continue to work with the respective states in their efforts to effectively and adequately regulate enhanced recovery operations to protect underground drinking water supplies. Further, if EPA determines that the states have not acted responsibly toward this goal, then the agency should proceed with reasonable, yet equitable regulations that would apply to such states in the Appalachian Basin and elsewhere.

The need to continue to work to protect our underwater resources as well as to continue to produce high quality crude from this historic area is one of our highest priorities. Pennzoil believes, as strongly as the states that contain these resources, that these goals, with proper oversight, can be achieved.

TESTIMONY OF
SHARI OSTER AND DONNA TROCCOLI,
HAUPPAUGE, LONG ISLAND
BEFORE THE
SUBCOMMITTEE ON HEALTH AND ENVIRONMENT
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE
AUGUST 22, 1980

"DUMP THE DUMP" became organized last January when it came to our attention that the New York State Department of Environmental Conservation was holding hearings on the expansion of a land disposal facility in our town. The community became concerned because the landfill is in the middle of a residential area and immediately next to an elementary school.

Initially, we were concerned with the basic nuisances of a landfill. In the course of gathering information we discovered that, according to an official of the New York Department of Environmental Conservation, the landfill had a sordid history. Specifically, we discovered that in 1959, the landfill was opened against the advice of the town's own engineering consultants. The landfill is located directly over the Magothy Aquifer, which supplies the drinking water for all of Long Island. Our investigations further found that perchlorethylene and vinyl chloride were disposed of in our landfill in the early 1970s.

As a result of waste leaking from our landfill, 55 private drinking water wells around the site have been closed. The following chemicals were discovered in private wells around our landfill: TETRACHLOROETHYLENE, DICHLOROETHYLENE, VINYLE CHLORIDE, TRICHLOROETHYLENE, METHYLENE CHLORIDE, METHANE, and TRICHLOROETHANE. More onimous, however, is the finding last May of vinyle chloride in

the elementary school near the landfill. As a result of our findings and the inability of our local and State government to responsibly address our concerns, we turned to our Congressman, Thomas Downey, for help to bring in the Environmental Protection Agency as our last "court of resort."

Recently, the Environmental Protection Agency has become involved in monitoring the environmental situation and has assured us that they will use whatever legislative authorities they have to afford us protection. Anything this subcommittee can do to strengthen governmental aid to help us and communities like us is desperately needed.

We'd like to present to this subcommittee, for the record, a notebook we've compiled of our problems in Hauppauge.

Thank you.

[Whereupon, at 2:05 p.m., the hearing was adjourned.]

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