



PUBLIC WATER SUPPLY IN NASSAU COUNTY -
THE THREAT FROM ORGANIC CHEMICALS¹

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Introduction

Mr. Chairman, honorable members of the State Legislature, members and friends of the Long Island Water Conference, I am pleased to have this opportunity to discuss with you the life blood of Long Island - its water supply. Today, we all share concerns and responsibilities for the safe quality of our water sources; 10 years ago we were concerned primarily with the sufficiency of water, and 20 years ago most people took our water supply for granted.

My purpose tonight is to briefly outline the threats to the purity of our water from carcinogenic chemicals, the efforts underway to identify and eliminate these threats, and the work which remains to be accomplished in order to insure a plentiful supply of safe water in the future.

Groundwater Contamination by Trace Organic Chemicals

Since the first documentation of contamination of municipal wells by suspected carcinogens three years ago, we have amassed a great deal of information through comprehensive testing of wells. We have learned that almost 30 percent of our wells are tainted to some extent with industrial solvents and that four percent contain levels of these

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chemicals high enough to require the restriction of well use as a prudent public health measure.

These chemicals are found throughout our aquifers with a greater concentration in vicinity of industrial areas. More shallow wells are contaminated with higher levels of chemicals than are the deeper wells. To illustrate, of the wells which contain any amount of organic chemicals, 68 percent have concentrations less than 10 parts per billion, 19 percent have levels between 10 and 50 ppb, and 13 percent have levels exceeding 50 ppb. Thirty four percent of shallow (Glacial) wells contain organic chemicals, 31 percent of intermediate (Magothy) wells, but only six percent of deep (Lloyd) wells.

We have been able to identify the major sources of these chemicals, notably industrial and commercial waste discharges and consumer products. A systematic door-to-door survey starting in December 1976 of over 3,000 establishments throughout the County revealed 269 which used chemicals of concern. Corrective action has been achieved in 236 establishments and regulatory procedures are in process for 33 other plants. Of the 236, 164 are store and remove permits.

Industrial solvents have been identified in 264 consumer products with specific concern for cesspool and drain cleaners containing these chemicals. We worked closely with the State Attorney General's office in developing a State bill banning the sale of such products.

Gasoline Contamination of Groundwater

Concurrent with the investigation of industrial solvents another threat to our groundwater resources has been experienced from the rupture of increasing numbers of underground gasoline storage tanks at automotive

service stations. Since May 1976, 38 incidents of such leaks have been verified in Nassau County alone. Thirty one sites are in various stages of recovery and 18 are actively recovering petroleum products at the present time.

The particular water supply concern regarding gasoline leaks is that benzene and several other gasoline constituents are soluble in water to a small but sufficient degree to be significant to public health. Benzene is a known carcinogen and banned in consumer products. The informal maximum limit for benzene in drinking water is 5 ppb. Other organic gasoline constituents are governed by interim State guidelines of 50 ppb.

Gasoline products also contain varying amounts of tetra ethyl lead, methyl ethyl ketone (M.E.K.) and manganese, all of which are known or suspected toxicants in drinking water.

We have been able to demonstrate that these toxic chemicals can and do reach the groundwater. Benzene concentrations in the groundwater at the 50,000 gallon East Meadow spill site have been as high as 80,000 ppb at a point one-third of a mile southwest of the spill. Groundwater pumped at the spill site has contained benzene at 19,000 ppb. Other constituents of gasoline - lead, manganese, toluene, and xylene - have also been detected in limited tests of groundwater at levels exceeding levels considered safe in drinking water.

Our Department has advocated that the State oil spill clean-up policy include not only requirements to recover the product, but to restore groundwater quality to drinking water standards. Eight cases have been referred to the State Department of Environmental Conservation

for legal action to require perpetrators of spills to institute proper recovery operations including restoration of groundwater quality.

The prevention of gasoline leaks has been addressed by careful technical and administrative strategies to minimize the incidence of spills and to insure quick identification of those that do occur. A proposed County ordinance has been prepared which combines requirements for non-corrodible tank materials for new tanks, a replacement schedule for old tanks, requirements for daily product inventory control, and periodic tests to ensure integrity of tanks.

Unmet Needs

There are several matters relating to organic chemical contamination of groundwater which remain to be resolved in spite of the important work which has already been done. First we need to conduct further tests for organic chemicals not yet adequately studied. We must complete the identification and elimination of sources, particularly drycleaning plants, automobile service stations, recharge basins, and landfills. Existing contamination of the aquifers must also be carefully studied and decisions made on the most appropriate way to manage this problem. This work requires electronic data processing and detailed on-site exploration of the mechanics of transport of organic chemicals in the groundwater. Regulatory measures are required as well to improve the operation of the State oil spill compensation fund and to expand it to include all hazardous substances. Preventive regulations are needed to require adequate protection measures for all hazardous substances to prevent accidental spills as is presently required only for oil terminals. Finally we need to have drinking water standards adopted for organic chemicals. A closer identification of these matters follow.

Further comprehensive testing of the groundwater is needed to insure that all types of organic chemicals are properly evaluated. Until now we have concentrated on the volatile halogenated compounds which are in general use by commerce and industry and in the home. Most common are tri and tetrachloroethylene and 1,1,1. trichloroethane. Other groups are the non-volatile halogenated and non-halogenated compounds, many of which are in widespread use, and which are considered toxic. Test information on these chemicals locally is sparse and a study in depth is needed.

Another group of organic chemicals which have not been evaluated on Long Island are an array of 131 so called, "priority pollutants" published by the USEPA. It is appropriate to conduct a reconnaissance survey for these chemicals in about 10 percent of public wells representing all basic conditions of land use, hydrology, and geographical distribution.

Monitoring for both groups of chemicals should be intensive in the Glacial aquifer to better identify relatively new contaminants so that predictions of future Magothy impact may be made in time to enable preventive strategies to be designed and implemented. The additional monitoring work described above is planned during 1980 as one of a group of Long Island groundwater studies to be funded by a special appropriation of \$400,000 by the State Legislature.

Finding sources of organic chemicals and systematically eliminating them is probably the most productive activity we can perform. Additional work needed includes the systematic survey and regulation of 400 dry cleaning plants and 1,000 automobile service stations. It is appropriate to point out that the preponderance of source identification

and abatement work completed thus far has been through a CETA contract. Additional work must be at the expense of other environmental health programs or subsidized by the federal or state government.

Other potential sources of organic chemicals are stormwater recharge and leachate from landfills. Contribution of these chemicals from recharge basins is to be studied under the continuation of the areawide wastewater management(208) study for Long Island which will investigate impact of recharge on groundwater quality in relation to organic chemicals and evaluate control measures.

Little definitive information is known concerning the contribution of organic chemicals to the groundwater by landfill leachate. Sporadic tests thus far show no danger. These tests have not covered the full gamut of organic chemical groups and have been few in number. This work requires the drilling of test wells through and adjacent to existing landfills and comprehensive sampling and testing. It is beyond the resources of the local health department to perform and may be possible under the Federal Resource Conservation and Recovery Act or as part of continuing 208 groundwater studies, both of which are to be administered by the N.Y.S. Department of Environmental Conservation. Appropriate test sites are the Syosset landfill and the Old Bethpage landfill since they are both located in the direct recharge zone and have a history of receiving industrial wastes.

The matter of organic chemical contaminants already in the groundwater needs to be studied to determine the most effective overall water management strategy. The mechanics of transport of organic chemicals in the groundwater must be studied at representative sites and relationships determined. These findings in turn can be applied using mathematic

modeling and electronic data processing to find the best overall solutions for contaminated aquifer segments.

The initial step in the overall investigation is planned as part of the \$400,000 State legislative appropriation for Long Island ground-water studies. A project is planned for the Roosevelt Field Water District area which will involve the installation of 25 test wells over and above 30 wells already in place. Data from intensive sampling and testing will be used to trace contaminants from well screens back to their source. The project will cost \$70,000 over and above health department staff costs.

Another concern which has not been adequately addressed is protection and prevention measures in the processing and handling of hazardous substances in general. While there is a State requirement (Article 12, State Navigation Law) for proper safety measures to prevent spills of petroleum products at major facilities, there is no such provision for other substances such as industrial solvents which are equally hazardous. While the Suffolk County Department of Health Service has such an ordinance and similar legislation is under consideration in Nassau, such legislation would be most appropriate at the State level.

Similarly, the clean-up of spills of petroleum products is covered under Article 12 of the State Navigation Law, but there is no provision for clean-up of spills of non-petroleum hazardous chemicals except insofar as the State Conservation Law prohibits discharges of toxic substances to waters of the State. Clearly the New York Environmental Protection and Spill Compensation Fund needs to be expanded to cover all hazardous substances or other appropriate legislation enacted.

While clean-up of oil spills under Article 12 has been a great step

forward, the experience thus far has shown the need for improvements both in the law itself and in its administration. The provisions of the law are vague in terms of standards to which the environment must be restored and is variously interpreted by DOT representatives and Department of Environmental Conservation advisers. Initially, recovery of spilled product was considered sufficient. Demonstrated adverse impact on groundwater quality on Long Island by spilled gasoline has not engendered a tightening up of requirements to restore groundwater quality.

The law furthermore assigns environmental assessment responsibility to the Department of Environmental Conservation which in turn delegates most of the work to the local health departments without compensation beyond the normal 50 percent program subsidy covered by State Assistance. Such environmental assessment work should be covered in the law and required to be paid by the perpetrator of the spill directly or through the compensation fund.

The administration of the law, particularly by the State Department of Transportation, is woefully inadequate with one engineer and an assistant assigned to cover Nassau and Suffolk Counties. The result is delay in reacting to leaks, lack of formal administrative procedures, and lack of standards and schedules for identifying the limits of product excursion as well as groundwater contamination for the clean-up phase. Finally there is a reluctance to take aggressive action against perpetrators for fear they will balk and necessitate the activation of the compensation fund. There needs to be a larger and more responsive commitment of DOT to this function or else the program should be reassigned by the State Legislature. The Department of Environmental Conservation similarly should provide adequate manpower to perform

their environmental assessment function, develop and implement rigorous standards for groundwater protection and aggressively prosecute offenders.

Recommendations

It is recommended that the State Legislature favorably consider the following actions:

1. Appropriation in 1980 of an additional \$400,000 in funds for groundwater studies on Long Island allocated to the two County Health Departments dependent on their demonstration of satisfactory performance of studies currently funded.
2. Amendment of the Environmental Conservation Law in regulation of sewage system and drain cleaners and additives (S.2382, A.3111).
3. Amendment to the Environmental Conservation Law (S.3976, A.5992) to require clean-up of spills of all hazardous substances and not merely petroleum products with amendments to require proper protection and prevention as is required for petroleum products.
4. Amendment of Article 12 of the State Navigation Law to specify environmental standards for clean-up of petroleum product spills particularly as applies to sole source aquifers and also to provide for compensation from perpetrators of spills for actual and necessary environmental assessment performed by regulatory agencies directly associated with the spills.
5. State Legislature investigation of the administration of Article 12 of the State Navigation Law by the State Department of Transportation and the Department of Environmental Conservation to determine whether the intent of the law is being properly enforced and to motivate such changes as may be indicated either in the law or in agency responsibility.

Conclusion

The protection of the groundwater resources of Long Island from contamination by organic chemicals is a common responsibility of all levels of government, all political factions, the waterworks industry, and the general public. Collectively, we have the resources and the expertise to do the job. If we do not, we may gradually succumb to the plight of the Ancient Mariner, "Water, water everywhere, but not a drop to drink".



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