



# 1987 PROGRESS REPORT

## Office of Environmental Health Assessment

**New Jersey State Library**

September 1987

974-90

H434

1987z

N.J. Department of Environmental Protection  
Division of Science and Research

1900

OFFICE OF ENVIRONMENTAL HEALTH ASSESSMENT (OEHA)  
1987 PROGRESS REPORT

prepared by  
Jeanne Herb and Jailyln Brown

New Jersey Department of Environmental Protection  
Division of Science and Research (DSR)

Thomas Kean, Govenor  
Richard Dewling, Commissioner  
Robert Tucker, Director  
Henry Garie, Assistant Director

September 1987



## Executive Summary

This report describes the Department of Environmental Protection (DEP) Division of Science and Research (DSR) Office of Environmental Health Assessment's (OEHA's) accomplishments and significant contributions to the assessment, communication and mitigation of environmental health risks in New Jersey over the past year.

OEHA was established through one of the Governor's 1986 environmental initiatives to coordinate and enhance environmental health risk assessment activities within the State. As a result of its highly technical nature, health risk assessment has evolved into an extremely diverse field with a variety of methods and techniques which are not always comparable. In addition to sometimes being incompatible, various risk assessment methods may also lead to divergent conclusions regarding potential health risks at a particular case. It is imperative, therefore, for New Jersey to develop the appropriate application of risk assessment as well as for the appropriate use of the various risk assessment methods in order to ensure that health risks are being assessed in New Jersey using the most current and best-available methods.

While health risk assessments are developed by a number of various government agencies in New Jersey, it was necessary for OEHA to focus its attention on the two agencies that utilize health risk assessments most frequently to study environmental health situations - DEP and DOH. During 1987, OEHA's attention was turned to, first, establishing the ties within and between these two agencies through which coordination of risk assessment could be promoted and, second, undertaking cooperative investigations with these two agencies in order to demonstrate the joint use of state-of-the-art risk assessment techniques. Much of OEHA's efforts during this first year were directed at developing the necessary structures and networks to coordinate the health risk assessment activities of DEP and DOH. In a number of the cases involving joint investigations, OEHA acted as an intermediary between DOH and the DEP division with regulatory responsibility for the case.

The joint cooperation on environmental health issues between DEP and DOH was exhibited through a variety of risk assessments, health investigations, and joint grant proposals to federal agencies. These joint efforts are providing evidence of the benefits of linking environmental and human health data and resources in planning research and response oriented activities. The OEHA mechanism for this cooperative approach is establishing New Jersey as a model state approach to address complex environmental health issues.



OEHA is composed of three working groups, the Risk Assessment Unit, the Risk Communication Unit and the Risk Reduction Unit. Each unit is charged with addressing a different aspect of environmental health risk, including risk identification/characterization, communication and abatement, respectively. It is the units' cooperation that provides a unique and useful method of problem solving. OEHA's methodology is supported by three basic tenets: (1) conduct research to identify and utilize the latest and best-available science and technology, (2) undertake pilot studies to evaluate research results, and (3) employ a multi-media perspective in addressing environmental health problems.

Over the past year, OEHA has laid the foundation for performing its mission by bringing together a staff of highly trained scientists specializing in a variety of disciplines, developing support networks within the Department, within the State and throughout the Nation, and initiating a set of projects that simultaneously investigate fundamental problems in and set a National precedent for studying environmental health issues. As the next year progresses the Office will focus on extending its interactions with DOH and within DEP in order to impact and coordinate environmental health risk assessment efforts within the State. Conceptual frameworks have been formulated for each of the units, as well as for the Office, that guide the units in their efforts to meet OEHA's mandate. We are at the stage of developing the necessary tools to comprehensively address the threats posed to public health by environmental toxic contamination.



## Table of Contents

I. Introduction .....	1
II. Background .....	1
III. OEHA Organization and Methodology .....	2
IV. Administrative Program Achievements .....	4
A. OEHA - EOHSI Fellowship Program .....	4
B. DEP - DOH Memorandum of Understanding .....	5
C. State Risk Assessment Demonstration Project with the National Governors' Association .....	6
V. 1987 OEHA Environmental Investigations .....	6
A. Integrated Investigations .....	7
1. A-280 .....	7
2. Union Lake .....	8
3. Ciba-Geigy .....	9
B. OEHA Unit Investigation .....	9
1. Risk Assessment Unit .....	9
2. Risk Reduction Unit .....	11
3. Risk Communication Unit .....	12
VI. OEHA Staff .....	14
VII. Conclusion .....	15

## Figures

1. Office of Environmental Health Assessment.....	2
2. Office of Environmental Health Assessment Staff ...	14



OFFICE OF ENVIRONMENTAL HEALTH ASSESSMENT  
1987 PROGRESS REPORT

I. INTRODUCTION

In reponse to Governor Kean's concern for improved protection of public health in New Jersey, an environmental health assessment initiative was developed to comprehensively address the health consequences of human exposure to toxic contaminants in the environment. A focal point of this initiative was the establishment of the Office of Environmental Health Assessment (OEHA) within the Department of Environmental Protection's (DEP) Division of Science and Research (DSR). OEHA's purpose is to coordinate and enhance environmental health assessment activities within the State by working closely with DEP's regulatory programs, the State Department of Health (DOH), the State's academic community and local government. As such, OEHA has three primary objectives: 1) to improve the performance, application and interpretation of the risk assessment process in the State, 2) to improve public understanding of governmental decision-making with respect to environmental health issues, and 3) to develop management alternatives for mitigating identified public health risks. The establishment of this office is unique to the field of environmental regulation in its focus on a state-of-the-art approach to policy development and problem solving based on the integration of risk assessment, risk communication and risk reduction.

II. BACKGROUND

The environmental movement over the past decade has served to raise the awareness of most public and private organizations regarding the potential and actual difficulties that result from polluting the environment. The primary problem for environmental regulators has been in characterizing the types, sources and locations of toxic materials that have been released to the environment. Recognizing the importance of this undertaking early-on, New Jersey established itself as a national leader in identifying the occurrence and fate of toxic materials in the State's air, water, soil and biota. Much of New Jersey's groundbreaking work in problem identification of environmental toxic contamination was done in the Division of Science and Research. Identifying and characterizing environmental contamination is a complex problem. The nature of the problem is compounded by the increased sophistication of detection techniques and the cross-media interactions of pollutants. DSR still holds as one of its primary goals the continuing expansion and refinement of our understanding of the fates and effects of toxic substances in the environment.



As the nature of environmental toxic contamination has become better understood, society has begun to recognize the need for better characterizations of the risks that such contaminants pose to human health and for the development of strategies to mitigate those risks. OEHA was established to lead the State in addressing the protection and improvement of the public's environmental health. DSR, of which OEHA is a component, has as its mission the complementary goals of protecting the public's health from environmental toxic contaminants, and identifying and studying toxic fates and effects.

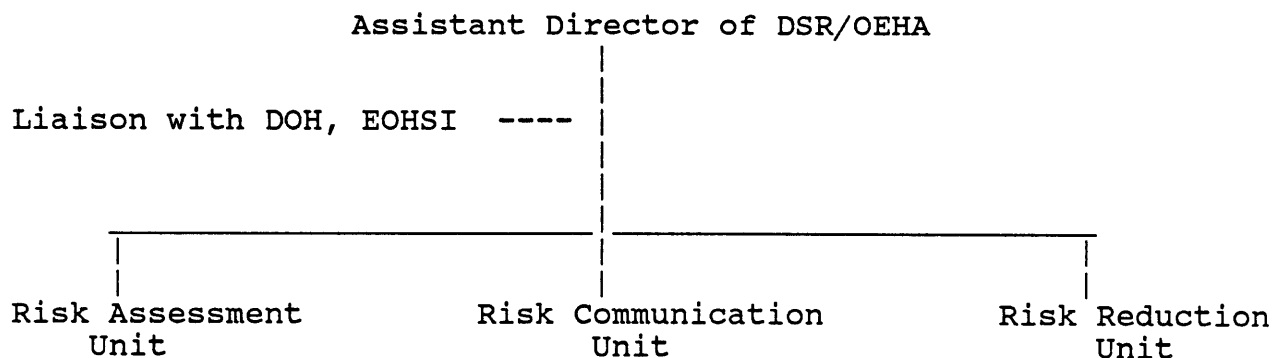
### III. OEHA ORGANIZATION AND METHODOLOGY

OEHA is one of two offices within DSR, the other being the Office of Environmental Research (OER). OER is responsible for investigating toxic fates and effects, and developing and testing environmental monitoring methods. As the characterization of environmental impacts and environmental health impacts are often complementary, the activities of OER and OEHA are coordinated to enhance the accomplishments of both.

OEHA is comprised of three units: Risk Assessment, Risk Communication and Risk Reduction. Each unit addresses one of the three objectives for which OEHA is responsible, health risk identification/characterization, communication and abatement. These objectives represent the three different aspects of environmental health problems. It is the units' cooperative efforts that make OEHA's comprehensive problem solving ability useful and unique. Hence, the office has been organized to thoroughly address the individual components of environmental health problems, as well as to develop holistic, integrated solutions to those problems.

FIGURE 1

#### OFFICE OF ENVIRONMENTAL HEALTH ASSESSMENT





The Risk Assessment Unit (RAU) provides a focal group and organizing force for OEHA in pursuit of a fundamental office goal: to supply a centralized effort to coordinate and plan risk assessment activities in New Jersey. In addition, the RAU is responsible for initiating research projects that improve risk assessment methods and strategies, as well as conducting and reviewing specific risk assessments.

The Risk Communication Unit (RCU) is primarily interested in the public's understanding of environmental health risks, and the public's understanding of and participation in the decision making processes that identify and address those risks. The RCU is improving the DEP's ability to effectively communicate with the public. The RCU does this by incorporating research that applies current and innovative communication theory into a communication process that emphasizes early and two-way involvement of the public when addressing public health risks. In addition to conducting research and case studies, the RCU is responsible for advising on, developing, coordinating and implementing environmental health communication plans that act as an integral part of Departmental investigations and enforcement actions.

The Risk Reduction Unit (RRU) is responsible for identifying, evaluating and developing long-term strategies for reducing toxic contamination of the environment, in order to limit corresponding human exposure to those toxics. The RRU is concentrating its efforts in two areas: source reduction and environmental risk mitigation. Source reduction strategies define methods to decrease the amount of toxic wastes generated at industrial facilities, thus limiting the amount of hazardous materials to be discharged or disposed. Environmental risk mitigation strategies investigate the use of innovative technologies and processes to lessen or remove the environmental and health threats caused by actual or anticipated environmental contamination. The RRU is conducting research to define the technological, economic, social and regulatory components that contribute to the promotion or hinderance of implementing waste reduction and environmental risk mitigation programs.

During 1987, each unit developed a program plan that reflects the unit's missions, goals, and objectives for the next several years. In addition, each unit has established an advisory committee of DOH and DEP divisional representatives to provide input regarding the unit's plans and activities to ensure that OEHA is responding to the emerging environmental health needs of both agencies.

To augment and integrate the activities of each unit along with those of other State, local and academic agencies, several projects are being pursued outside of the individual unit endeavors, including joint research planning with the Department



of Health, development of a Science Advisory Board and administration of a fellowship program.

It should be stressed that while each of the three units discussed above has a specific mission, it is the integration of the units' activities that is inherent in the overall mandate for OEHA.

The office's methodology is supported by three basic tenets:

1. conduct research that will enhance DEP and DOH efforts to address public health concerns by including the latest and best-available methods for identifying, reducing and communicating environmental health risks,
2. undertake pilot studies utilizing methodologies developed through research to evaluate the effectiveness and applicability of those methodologies for New Jersey specific environmental health problems, and
3. employ a multi-media perspective in problem solving that avoids transferring contaminants from one environmental media to another. (Research has shown that past efforts to address environmental contamination through one environmental media at a time --- air, land or water --- often results in the transfer of contamination from one media to another, instead of the mitigation of contamination altogether).

#### IV. ADMINISTRATIVE PROGRAM ACHIEVEMENTS

As in the first year of any new program, achievements in the programmatic elements of OEHA were particularly important in 1987. These achievements helped lay the groundwork for the design and performance of research investigations. In order to promote interagency cooperation, OEHA staff endeavored this year to build and maintain formal ties with other State agencies, the federal government and academic institutions through a variety of mechanisms including data sharing and joint projects.

Three interagency program achievements were particularly important in 1987; the establishment of a graduate fellowship program, the finalization of a memorandum of understanding between DEP and DOH, and the performance of a demonstration project in conjunction with the National Governors' Association.

##### A. OEHA - EOHSI Fellowship Program

Recognizing that an effective health risk assessment program requires strong government support of and cooperation with the



State's academic community, OEHA is sponsoring a Fellowship Program for graduate and post-doctoral students. The Environmental and Occupational Health Sciences Institute (EOHSI), a joint undertaking of the University of Medicine and Dentistry of New Jersey and Rutgers University, is responsible for actual administration of the Fellowship Program. Two general purposes drive the need for the environmental Fellowship Program. First, the Fellowship Program provides a training ground for New Jersey students in the fields of risk assessment, risk communication and risk reduction and encourages students to remain within New Jersey after they have completed their graduate studies. Second, the OEHA Fellowship Program provides funding to exceptional graduate students to pursue research on issues that are identified by DEP and DOH to be pressing environmental health concerns in New Jersey.

The 1987 appropriation for the Fellowship Program was \$300,000 with awards ranging from \$3,000 to \$22,000 per year. 1987 fellowships range from ten one-year stipends to two "superfellowships" of up to four years. In addition, one post doctoral fellowship was awarded. The fellows' research topics include health effects related to particular contaminants, assessment of human exposure potential, and exploring applications of innovative cleanup technologies.

EOHSI, in addition to coordinating the Fellowship Program, provides a forum for interested parties to discuss common research interests and new directions in risk assessment. At the first annual colloquium on risk assessment, Assistant Director Henry Garie spoke about OEHA's goals and discussed with other DEP representatives and DOH, opportunities for cooperative efforts between the departments and EOHSI.

#### B. DEP - DOH Memorandum of Understanding

In order to formalize the interactions between OEHA and DOH, DEP Commissioner Richard T. Dewling and DOH Commissioner Molly Coye signed a Memorandum of Understanding on June 12, 1987. From an administrative perspective, the memorandum defines the shared and distinct responsibilities of the two departments in performing environmental health risk assessments and environmental health research. From a planning and research perspective, the memorandum establishes the mechanism necessary for the two departments to jointly identify emerging environmental and occupational health issues and to subsequently determine ways to jointly address resolution of those issues. Specifically, the cooperative agreement paves the way for OEHA to initiate, design and implement joint research investigations with DOH and to share information and resources.



To begin implementing the themes contained in the cooperative agreement, DOH and the Division of Science and Research held a joint research planning meeting in September 1987. This initial meeting between DSR and DOH staff identified several specific areas in which joint research investigations may be conducted. Follow-up meetings between the two staffs will be held during October to define actual projects for joint research.

#### C. State Risk Assessment Demonstration Project with National Governors' Association

The relationship between State and federal government agencies is critical when evaluating human health risks of environmental pollutants. In the case of environmental health risk assessment, there is a strong need for risk assessment efforts to be coordinated between the United States Environmental Protection Agency (USEPA) and DEP. This coordination is critical in the areas of standard setting for environmental discharges and public health protection; development of new risk assessment methods and guidelines; and the promulgation of federal as well as State regulations to protect public health.

As a result of the unique organizational structure of OEHA, the State of New Jersey was one of three states chosen by EPA and the National Governors' Association (NGA) to participate in a risk assessment demonstration project. This project explores ways of improving state and federal interactions in the risk assessment process. The project is being accomplished through technical staff interactions and reviews of actual risk assessments. During 1986-87 both DEP and DOH submitted representative risk assessments which were reviewed by the USEPA risk assessment program in Washington D.C. In addition to the risk assessment review, a formalized risk assessment personnel exchange program is being arranged between New Jersey and EPA.

#### V. 1987 OEHA ENVIRONMENTAL INVESTIGATIONS

The following descriptions of 1987 investigations include joint research projects with DEP and DOH as well as individual achievements of the three OEHA units. Listed first are joint investigations with DOH and/or other divisions of DEP that were conducted using an integrated "team" approach among the three OEHA units. Listed second are the distinct achievements and activities that are specific to each of the three OEHA Units.



## A. Integrated Investigations;

### 1. A-280: Development of Safe Drinking Water Standards

The New Jersey Safe Drinking Water Act (P.L. 1983, c.443) was amended in 1984 (Assembly Bill A-280) to ensure that all public water supplies would be routinely monitored for 22 organic contaminants. The A-280 amendments mandated establishing maximum contaminant levels (MCLs) for the specified chemicals, and established the Drinking Water Quality Institute (DWQI) to coordinate the development of standards.

The A-280 amendments catalyzed two years of research conducted by DSR, including Risk Assessment Unit staff, the DEP Division of Water Resources (DWR) and DOH. Health risk assessments were performed by OEHA risk assessment staff on the 22 volatile organic chemicals (VOCs) and chlorinated organics which formed the A-280 list. These health risk assessments formed the scientific basis for determining safe levels of drinking water contaminants. The results of this have allowed New Jersey to become the first state in the nation to develop health-based standards for volatile organic drinking water contaminants.

The MCL recommendations were released in March 1987, and OEHA's Risk Communication Unit worked closely with DWR and DOH in planning public communication strategies. In mid-April, the Risk Communication Unit convened environmental group leaders to comment on the methods used to develop the MCLs. Other components of a broad public education strategy planned by the Risk Communication Unit included developing a brochure for the public explaining the basis for the A-280 standards and guidelines for determining the quality of local community water supplies.

The Risk Assessment staff prepared a paper addressing the possibilities for applying the methodology developed to determine MCL's to the regulation of air toxics. The emphasis on health-based risk levels is not pervasive in air pollution regulation. The methods of risk assessment discussed in the OEHA paper may contribute to improving air quality standards. The paper was presented by Dr. Lubow Jowa at the annual national conference of the Air Pollution Control Federation in June 1987. In 1988, the Risk Assessment staff intend to expand the potential use of health-based methodologies to determine their applicability to developing criteria for remediation of hazardous materials in soils.



2. Union Lake: Interagency risk assessment leads to regulatory actions and public education to protect public health

Union Lake, New Jersey's second-largest fresh water lake located in Millville, is contaminated with arsenic poison which is suspected to have emanated from an upstream industrial source. Previous DEP and DOH research indicated that while the lake's waters remained at their usual height, no significant health hazards were posed to recreational lake users. However, degradation of the lake's dam at its southern end posed a serious threat to life and property downstream of the lake. As a result, reconstruction of the dam began in spring 1987. Upon notice that the dam reconstruction would necessitate a lowering of the lake's waters, DEP and DOH undertook a joint health risk assessment to determine whether the new conditions resulting from the dewatering would present a health threat to the lake's recreational users.

The consensus risk assessment, conducted by OEHA, DOH and the DEP Division of Hazardous Site Mitigation, concluded that the route of exposure that posed the greatest health threat was contact with the lakebed sediments, especially through ingestion of the sediments. Arsenic levels in some sediment samples had been measured at levels that might cause acute health effects, particularly in children. The risk assessment, therefore, concluded that because the drawdown of the lake would expose extensive areas of sediments, there was a significant health risk posed to recreational lake users. This conclusion prompted the DEP to close Union Lake to recreational use.

In finalizing the consensus risk assessment, OEHA staff worked cooperatively with the Cumberland County Health Department which planned to support the DEP lake ban. In addition, the OEHA Risk Communication Unit was integrated into the process in order to develop and implement a public education strategy to encourage adherence to the lake ban. The RCU was integrated into the process as soon as possible in keeping with its philosophy that involving the community as early as possible and integrating public outreach efforts as part of overall environmental management greatly enhances the relationship between State agencies and the community.

The Risk Communication Unit (RCU) was identified as the lead group within DEP for public education/risk communication on the Union Lake risk assessment. The RCU identified key issues to be resolved in order to develop communications with the local community. Subsequently, the RCU coordinated the activities of the various DEP divisions involved, DOH, local authorities and the State Division of Treasury which was overseeing the dam reconstruction. The RCU worked with these various groups to address and resolve issues such as enforcement, briefings for the communities, legal matters and long-term management concerns.



In terms of outreach efforts, the RCU identified key community leaders and held a briefing for them on the day that the lake ban was announced. The RCU also organized a joint DEP and Cumberland County Health Department press briefing to announce the ban. The RCU produced general summaries of the history of Union Lake and the risk assessment that were distributed to community leaders and the press; prepared a bilingual single page handout warning against lake use that was sent to community leaders, stores and community centers; maintained consistent contact with community leaders; arranged a briefing at the request of two community groups that have direct access to the lake; and arranged for the use of air monitors to address specific community concerns regarding the potential for arsenic in the sediments to be transferred to the air.

3. Ciba-Geigy: OEHA provides research support and communicates findings to the public

The Division of Science and Research released four final reports of research projects conducted pertaining to the Ciba-Geigy ocean outfall in May 1987. The research studies investigated the fate and transport of effluent discharged by Ciba-Geigy's ocean outfall located 3,500 feet off Ortley Beach, NJ. The findings showed that no measurable health risk is currently posed by the Ciba-Geigy ocean discharge.

In support of the DSR research program regarding Ciba-Geigy, the Risk Assessment Unit prepared an initial risk assessment and revised the risk assessment upon completion of the four studies released in May. The revised risk assessment utilized exposure data collected during the research studies conducted throughout summer 1986. This enabled the calculation of a "most likely" risk analysis and played an important role in reassuring the public of the safety of the ocean water in the vicinity of the discharge. In addition, the OEHA Risk Communication Unit (RCU) staff have worked cooperatively with DSR staff to interpret the research and risk assessment findings and convey those findings to the public.

## B. OEHA Unit Investigations;

1. Risk Assessment Unit: The OEHA Risk Assessment Unit (RAU) is responsible for conducting research to identify innovative risk assessment methods and for performing risk assessments when necessary. The RAU continually responds to requests from DEP Divisions to review risk related issues. Unit staff welcome opportunities to work with other divisions, and their expertise is increasingly recognized throughout the Department as risk assessment needs multiply in New Jersey. The RAU not only



provides technical assistance to DEP but also to other State agencies and to the public. In recognition of the overall OEHA goal of prioritizing New Jersey environmental health problems, RAU staff have contributed to DEP policy decisions. In total, the RAU staff conducted 50 risk assessments during 1987; three representative examples are outlined below.

- Dr. Lubow Jowa prepared risk assessments on selected pesticides found in indoor air for the DEP Bureau of Pesticides, Division of Environmental Quality. Since many homes in the State are treated to prevent insect infestation, it was important to determine whether the airborne amounts of these pesticides posed a risk to the health of the occupants of these homes. The pesticides examined include acephate, malathion, dichlorvos, pyrethrum and related compounds. The risk assessments will form the basis for guidelines concerning the pesticide treatment of homes.

- Dr. Gloria Post completed a risk assessment for dimethylformamide (DMF) in response to a request from the Division of Hazardous Site Mitigation. DMF contamination is found at one of DHSM's sites, and no acceptable daily intake level has been derived for this chemical by the EPA. The risk assessment reviewed all available information on the health effects of DMF and include some recent studies involving human occupational exposure.

- RAU Manager Dr. Robert Hazen has proposed a departmental policy regarding appropriate use of risk assessment as a decision-making tool. DSR will work with the DHSM Bureau of Environmental Exposure and Risk Assessment (BEERA) and the Environmental Cleanup and Responsibility Act (ECRA) program in conducting risk assessments at five contaminated sites. The analysis will include input from the DEP divisions and from DOH. Existing risk assessment guidelines will be used and those procedures which are judged to be useful in the case study will be candidates for inclusion into risk assessment guidelines tailored to New Jersey needs.

Many research investigations are underway to meet the RAU's mandate to conduct research on developing innovative risk assessment methods. An example of one of these research investigations is a study entitled "Quantitative Risk Assessment for Selected Volatile Organics in Drinking Water" conducted by K.S. Crump and Company, Inc., that enables DEP to firmly establish water quality standards and regulations. The study also sets broad limits on how to define environmental pollution in general. This report contains a description and critical review of 43 laboratory toxicology studies on ten chemical carcinogens, the application of mathematical models to this bioassay data, and quantitative risk assessment support documents



for the ten carcinogens. Relevant occupational studies on benzene and vinyl chloride were also evaluated. The quantitative risk assessments estimate the level of excess cancer risk associated with a concentration of environmental contaminants. This information will be used to support guidance and regulatory activity under the NJ Safe Drinking Water Program.

2. Risk Reduction Unit: During 1987 the Risk Reduction Unit concentrated its efforts on developing research investigations to study the potential for reducing the generation of industrial hazardous waste. Efforts of the RRU in this area of waste reduction complement efforts of other DEP divisions, most notably the Division of Hazardous Waste Management (DHWM). While DHWM concentrates its efforts on identifying immediate technical and policy alternatives for promoting waste minimization, the RRU efforts look to developing tools necessary to achieve a long term conceptual framework of which waste reduction is a component. In addition, program activities of the unit have focused on working with DEP divisions to begin incorporating waste reduction language into permit requirements. Former OEHA Risk Reduction Unit (RRU) Manager David Sarokin and current Manager Jeanne Herb have conducted extensive outreach to DEP divisions and to other agencies and groups to encourage the development of multi-media waste reduction programs. The increasing prominence of waste reduction as a state and federal issue stresses the importance of the multi-media research role the RRU plays in DEP waste minimization and waste reduction efforts. Below are listed examples of RRU activities during 1987.

- Working cooperatively with the DEP Division of Water Resources (DWR), the RRU drafted waste reduction requirements for inclusion in DuPont's industrial discharge (NJPDES) permit for the company's Chambers Works facility in Deepwater, NJ. DuPont's new permit includes a section requiring DuPont to report to the State on the facilities' in-house waste reduction activities and goals, and the factors influencing such practices. The RRU is also pursuing including similar waste reduction language into industrial air permits for specific companies as well as working with the Office of Regulatory Services to explore the potential of developing generic language that may be used in the future as part of overall permit development.

- Another RRU project underway in 1987 is a study to develop methods for conducting waste reduction audits at industrial facilities. Such methods development is needed because guidelines do not exist for the performance of multi-media audits to assess the potential and options for waste reduction at industrial facilities. The project will identify such guidelines and subsequently test their effectiveness through case studies.



- A third 1987 RRU investigation is a review of environmental regulations to assess the impact the regulations may have on waste reduction. Since state and federal environmental regulations have been developed over time and are typically specific to one media, there is no assessment of the potential for existing regulations to either promote or discourage industries to reduce their generation of hazardous wastes. The RRU is initially conducting the regulatory review on one environmental program in order to develop methods for expanding the regulatory review to other environmental management programs in New Jersey as well.

- A fourth RRU investigation pertains to assessing the potential of existing information resources within DEP to measure waste reduction. Researchers have interviewed relevant program staff and reviewed a variety of information collection forms and databases to assess how these types of information, collected for other programmatic purposes, could be applied to measure facility-specific efforts and industry-wide waste reduction trends.

- The RRU is also undertaking an investigation to develop a preliminary protocol that an agency may apply when pursuing the establishment of custom incentives for an industry to reduce waste generation. The study entails identifying existing and emerging technologies for a case industry that would lead to waste reduction. Subsequently the researchers will identify obstacles to industry adoption of those technologies and a format for identifying approaches to overcome the identified obstacles.

3. Risk Communication Unit: Similar to the Risk Assessment Unit, the Risk Communication Unit (RCU) conducts research to identify effective methods of communicating about environmental health risks with the public and assists DSR staff and other DEP divisions in performing risk communication activities. The RCU was extensively involved in the Union Lake, Ciba-Geigy and A-280 cases. In addition, RCU staff worked closely with DSR staff in considering communications issues related to investigations regarding radon in groundwater, Benzo (a) pyrene (BAP) in homes, and Tributyl tin (TBT) contamination to shellfish.

The RCU conducts communications research that is both of an empirical nature and from a practical perspective. In all cases, the research conducted is expected to provide a better understanding of how to communicate environmental health risks to the public and how to develop strategies to effectively integrate the public into environmental decision-making. The following on-



going projects exemplify how the RCU is enhancing the understanding of environmental communication.

- Public Perceptions of Environmental Hazards: In December 1986, DSR released the final report for the first year of a 2 year study of environmental perceptions. The report, prepared by the principal investigator, Dr. Neil Weinstein of Rutgers University, discussed the results of a statewide Eagleton poll that was designed to determine what New Jersey residents perceive as major environmental issues in the State as well as their perceptions of efforts to remediate environmental hazards. During 1987 the RCU has continued this research with Dr. Weinstein in order to study what factors influence the public's perceptions of environmental hazards. These results will assist the DEP in planning communications efforts that respond to the public's perceptions of hazards.

- Communicating Chemical Risks in the NJDEP: A manual of communications guidelines is expected to be finalized in December 1987 which is the culmination of research conducted for the RCU by the Environmental Communications Research Program at Rutgers University. Research included conducting interviews with risk communication experts, theorists, and practitioners to identify effective risk communication strategies. Rutgers University will work cooperatively with the RCU to develop a workshop highlighting the research findings and the RCU intends to sponsor additional sessions pertaining to the guidelines included in the manual.

- Three additional communications research investigations are underway with the RCU and Rutgers University. The first explores methods for evaluating the effectiveness of an environmental communications effort in order to allow DEP to identify those methods that work effectively. The second project investigates the most appropriate methods for conveying relative health risks to the general public and for explaining the probabilities associated with environmental health risks. This project is particularly important to DOH and DEP since both agencies are constantly faced with situations in which it is imperative that the public understand how certain environmental health risks compare to other health risks. The third project with Rutgers University involves developing a risk communication "cookbook" that includes detailed, step-by-step guidelines for developing and implementing an environmental communications strategy. During the second year of this study, the guidelines developed during the first year will be tested in a case study.

- Internal Needs Assessment: The RCU is currently working cooperatively with the DEP Office of Public Participation



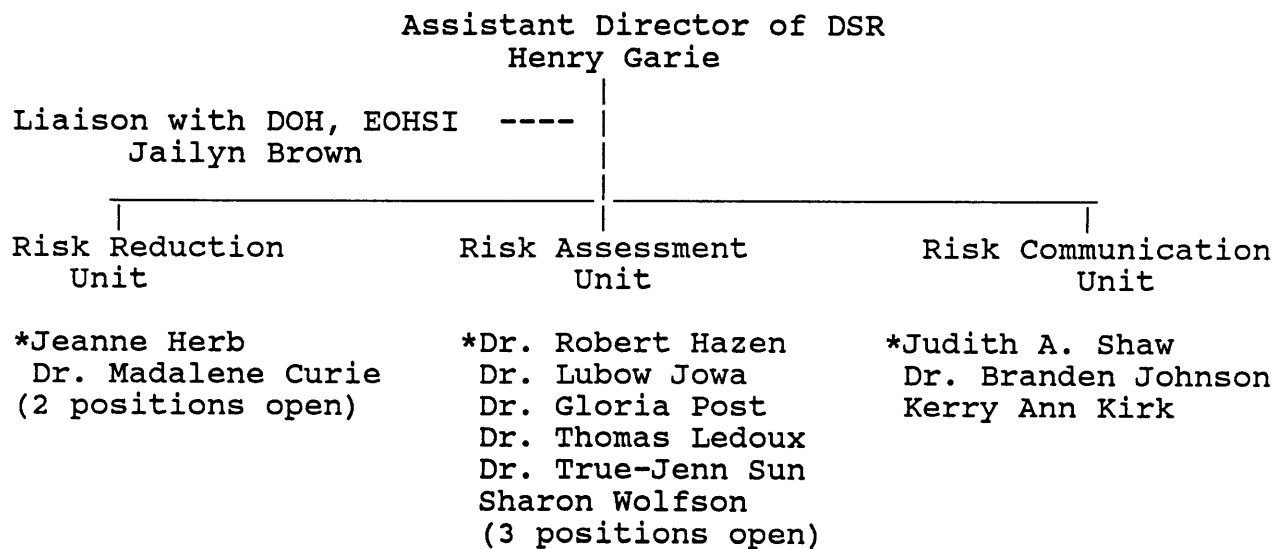
and the Office of Communications and Public Education to design a Department-wide needs assessment. The purpose of the needs assessment is to determine the current status of DEP communications/public participation programs in order to identify gaps or needs that, if addressed, could improve the Departments outreach efforts. It is expected that the performance of this needs assessment will be done internally by RCU staff.

## VI. OEHA STAFF

In planning the Environmental Health Assessment Program and OEHA, it was clear that to meet the challenges and extremely technical aspects of the program, it would be necessary for OEHA to be staffed with highly qualified individuals with appropriate education and experience. In order to identify appropriately qualified individuals, OEHA conducted a national recruitment search as part of an overall recruitment effort on the part of the Division of Science and Research. In particular, it was imperative that staff be hired with an understanding of the OEHA mandate as well as an appreciation for the need to develop innovative problem solving strategies for New Jersey's environmental health problems. Last, new staff were hired that complemented existing staff expertise both within OEHA and DSR. The chart below identifies the staff in each of the OEHA units.

FIGURE 2

### OFFICE OF ENVIRONMENTAL HEALTH ASSESSMENT STAFF



\* Unit Manager or Acting Manager



In addition to the OEHA unit staff outlined above, there are seven additional OEHA staff members assigned within DSR Units and six additional OEHA staff members within the DOH Environmental Health Service. The purpose for assigning these additional staff within DSR divisions and within DOH is to formalize the integration of all of DSR and DOH into the environmental health investigations coordinated by OEHA. By actually having its staff performing as an integrated part of DSR units and DOH, OEHA is able to ensure that environmental health investigations are conducted using state-of-the-art methods and the most updated data as well as to ensure that these investigations are based on comprehensive approaches utilizing DSR and DOH expertise. Five OEHA staff positions are still available and, as a result, DSR is continuing its national search to fill these positions by early 1988.

## VII. CONCLUSION

In summary, OEHA activities during 1987 focused on laying the foundation for the environmental health investigations that are central to the OEHA mandate. After careful planning, the OEHA organizational structure was established and detailed plans for research and investigations in the areas of risk assessment, risk reduction and risk communication were developed. Strong ties with appropriate DEP divisions, DOH, and other State and federal agencies were established that will allow OEHA to not only continually assess state-of-the-art environmental health investigation methods, but will also allow OEHA to publicize the results of its research investigations and methods development studies. A concerted recruitment effort allowed OEHA to hire highly qualified staff in the areas of economics, toxicology, epidemiology, communications, and biostatistics. Perhaps most importantly, through the performance of a number of research investigations and case studies, OEHA clearly demonstrated the need for coordination of health risk assessments in New Jersey. Similarly, these investigations and case studies proved that through effective integration of the risk assessment, risk reduction and risk communication disciplines, environmental health issues can more effectively be identified, addressed and resolved.





1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100