

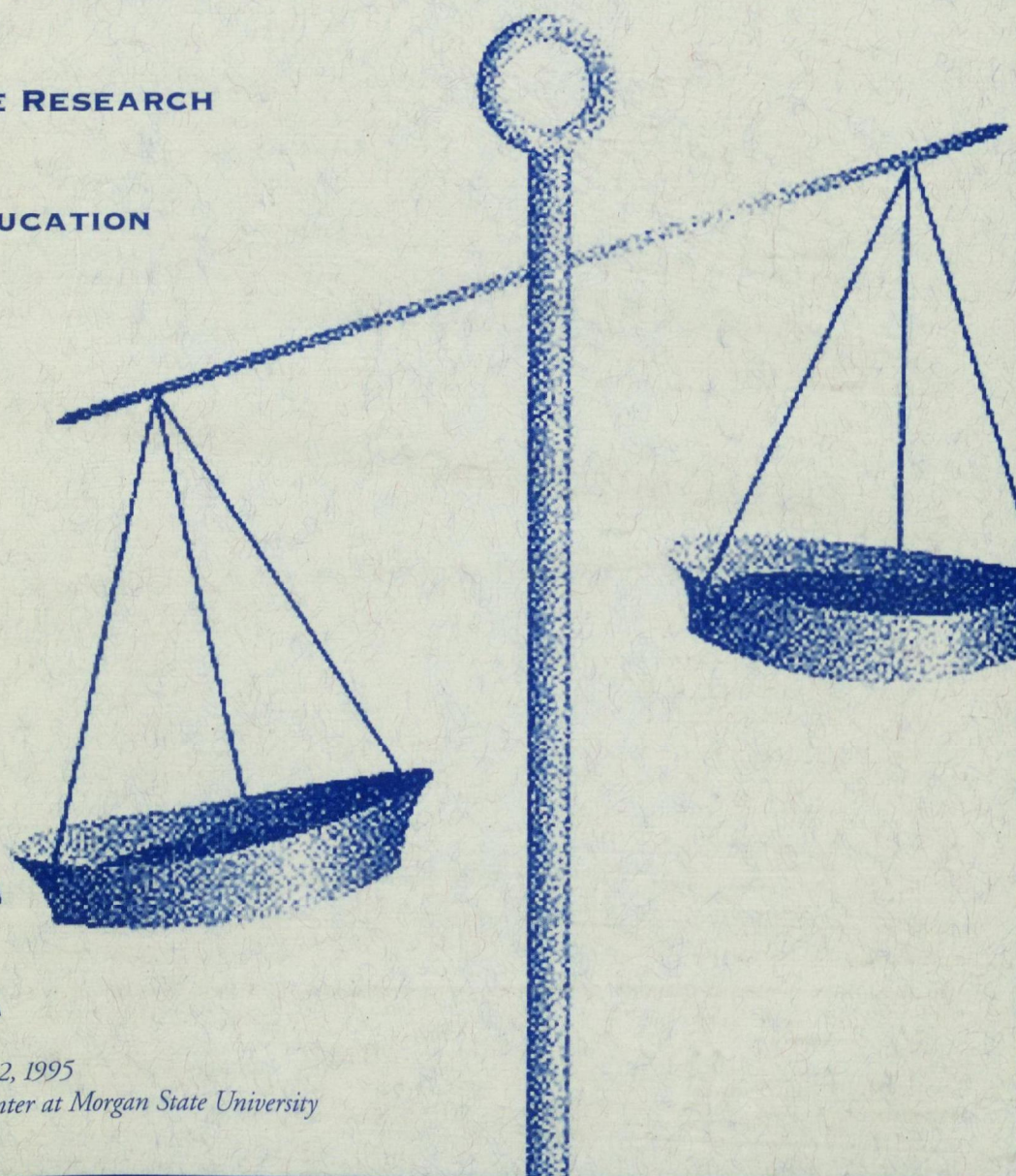
PROCEEDINGS OF THE

BALTIMORE SYMPOSIUM

ON URBAN ENVIRONMENTAL

JUSTICE RESEARCH

AND EDUCATION



*October 21-22, 1995
Keldin Center at Morgan State University*

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FOREWORD

ICMA is pleased to present the proceedings from the first Environmental Justice Symposium for the Baltimore Metropolitan Area. Speakers who wished to have their papers published submitted them for these proceedings. ICMA has included the abstracts of those papers which were not submitted for publication. The papers represent a broad range of topics of interest to both scientists and members of the Environmental Justice Community. The Table of Contents lists the papers in the order in which they were presented at the Symposium. The Symposium agenda and a final list of participants has also been included.

ICMA wishes to acknowledge and thank the speakers, the exhibitors, the planning committee and the sponsors of this Symposium. We appreciate the time and effort they put into making the Symposium a success.

This document is a compilation of presentations made during the Baltimore Symposium on Urban Environmental Research Justice and Education. Papers were submitted by the speakers and have not been edited by ICMA. The papers within this document do not necessarily reflect the view or the position of the International City/County Management Association, and no official endorsement should be inferred.



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**Baltimore Symposium on Urban Environmental
Justice Research and Education**

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Final Report

Baltimore Symposium on Urban Environmental Justice Education and Research

Final Report

Conference Objectives

The first Environmental Justice Symposium for the Baltimore metropolitan area, held on October 21 and 22, 1995, at Morgan State University, achieved four primary objectives. The Symposium provided an opportunity for researchers and educators to dispense and discuss the latest information on environmental research and education, specifically involving people of color and low income communities in this metropolitan area. Secondly, the presentations and poster sessions were means to enhance current research and educational activities by allowing for the exchange of information among scientists, educators, and community representatives. This communication helped to achieve the third Symposium objective: to explore and frame additional research needs in the environmental justice field. Finally, the proceedings of the Symposium are set forth herein to facilitate in the dissemination of the findings and presentations made in this two-day event.

Plenary and Informational Sessions

Presentations in the Plenary and Informational Sessions were made by members of the federal, state and local governments, as well as the Environmental Justice community. These individuals included: The Honorable Jane Nishida, Secretary of the Environment, Maryland Department of Environment; Dr. Cecil Payton, Executive Assistant to the President, Morgan State University; Mr. Stanley L. Laskowski, Deputy Regional Administrator, EPA Region III; Mr. Charles C. Graves III, Director of Planning, City of Baltimore; Dr. Gustav Jackson, Director of Environmental Studies, Sojourner-Douglas College; and Dr. Clarice E. Gaylord, Director, EPA Office of Environmental Justice. Each speaker expressed a commitment to foster environmental justice.

Dr. Gaylord elaborated on the history of the environmental justice movement and the approaches the federal government is taking to respond to environmental justice issues. Five approaches were described by Dr. Gaylord, including:

- * Integrating environmental justice concepts into all federal programs and ensuring that affected parties have a voice;
- * Performing additional research to identify affected communities and their exposure to hazards. Specifically targeted in this research are multiple exposures and low level, cumulative effects;
- * Developing better, more reliable data collection and analysis stratified by race and income, and making this data available in a "user-friendly" form;

- * Using a more multi-media approach for assessing risk and enforcing compliance with environmental laws; and
- * Ensuring that advice and input is provided by the community, which is then utilized to frame the national environmental agenda.

Dr. Gaylord further stated that EPA recognized that many communities were uninformed about their rights and did not have the technical support or resources to address their concerns. In response, EPA established a hotline and developed two grant programs. These programs include a Small Grants Program which provides for up to \$20,000 to address local problems. Approximately \$3 million has already been distributed to 175 communities under this project. The second program is the Community University Partnership Grant, which provides \$300,000 to a college or university which has established a partnership with an Environmental Justice community to work on a specific Environmental Justice issue or problem. Both the grants and the hotline are designed to help communities through education and technical assistance.

EPA is not alone in addressing environmental justice issues. A total of thirteen federal agencies have developed strategic plans to address these issues, in accordance with President Clinton's Executive Order number 12898.

The Plenary and Informational Sessions set the stage for the range of topics presented over the two days of the Symposium.

Panel Discussions

Four panel sessions were held during the Symposium allowing thirty papers to be presented. The session topics included Outdoor Pollution, Household Hazards, Sustainable Community Development, and Urban Environmental Assessment and Management. A closing panel was also held to discuss "Opportunities for the Future". After the presentations, panel discussions were conducted. The following is a summary of those presentations and discussions.

**** Outdoor Pollution***

The Outdoor Pollution Panel included presentations on employee commute options and the social and economic impacts of meeting the employee commute regulations; a technology-based approach to improve public awareness of ground-level ozone pollution; toxic chemicals and contaminants in the Baltimore Harbor; and concentrations and sources of contaminants in Baltimore air.

The panel discussion identified research gaps relating to employee commuting. For example, it is commonly assumed that much of the air pollution originates from urban sources. However, information is lacking about the pollutant contribution from these sources versus pollutants originating as a result of commuting and transportation of products to and from the suburbs.

Additionally, it was discussed that the impacts of employers encouraging ride share still needs to be addressed. Economic disincentives to encourage ride share places an extra burden on low income employees. Furthermore, incentives for ride sharing, such as flexible schedules, gives a disproportionate advantage to higher income employees. Gaps in data were also identified in the area of acid aerosols and diesel soot, both of which are significant irritants.

The discussion also emphasized that all of us share the responsibility for the pollution we create. Each of us has a role and can make personal choices to improve the environment. The environmental justice community must be informed to make choices that can help the environment and to ensure that environmental protection is equitable.

It was identified that research information is not readily available, accessible or understandable to the lay person. The American Lung Association of Maryland's work with the ozone map, which is broadcast during local television weather reports, was a good example of putting the results of research into practical information for the general public. This kind of research application is needed to influence policy makers.

** Household Hazards*

The Household Hazards Panel addressed issues on lead poisoning exposure and prevention, radon testing and mitigation, asthma in children, and the relationship between short-term measurements and long-term exposure.

Much of the discussion centered on lead-related issues. Concerns were raised about the lack of alternatives to housing that contain lead hazards. Furthermore, it was stated that some landlords have been apathetic to abatement programs, and that it is within their rights to evict tenants if lead poisoning occurs from lead on their properties. Under these circumstances, the tenant is twice victimized. Further research needs on lead issues include: how to find funding to create lead-safe housing; how to raise awareness of the fact that creating lead-safe housing is affordable; how to provide alternatives to housing that contains lead; how to disseminate information to encourage blood-lead testing of at-risk children.

The use of the legal system to address property owners and lead poisoning was discussed. It was stated that many lawsuits related to this issue languish for years providing little or no relief to the poisoned child. Emphasis should be placed on lead poisoning prevention and enforcement of "livability" (housing) codes.

** Sustainable Community Development*

Sustainable Community Development was addressed via issues of Brownfields economic redevelopment, the role of law school clinics in aiding Baltimore's communities, zoning issues and community impacts, high school student involvement, organizing for sustainable, healthy communities, and the development of the Fairfield Ecological Industrial Park.

Issues discussed during this session included the need for the active involvement of the community for sustainable development to occur. Resources need to be transferred to local groups in order for their involvement to be more effective. Additionally, it was discussed that, in the development process, sustainability could be achieved when environmental responsibility is "married" to job development.

The issue of zoning and its impact on a black versus a white community was also presented. In the case presented, certain zoning decisions influenced African-American communities disproportionately. The need for additional information on other communities with similar experiences was mentioned, as well as a need for the enforcement of the environmental and zoning laws in these communities.

** Urban Environmental Assessment and Management*

The Urban Environmental Assessment and Management session covered the issues of: environmental justice and environmental impact statements; the Baltimore, Chester and Philadelphia assessment initiatives; building trust in community environmental health research; and EPA's community environmental justice empowerment project.

The discussion raised the issue that the community in general gets frustrated with the complexity of government and the compartmentalization among government agencies. Communities, it was stated, must be empowered by involving them in defining and solving the problems. The focus in the future should be on a community-based approach to solving problems. Work that is still needed includes: research on cumulative effects of exposure; the transformation of information and tools into a format that can be used by the community; and the development of preventative strategies for the betterment of public health.

** Concluding Panel - Opportunities for the Future*

The concluding panel discussed, in general, the issues addressed during the Symposium and opportunities for the future. The discussion recounted the need to take a bottom-up approach in solving environmental problems. The Environmental Justice community requires more information and resources to take on environmental problems. Grass roots organizations, specifically, were mentioned as needing to be more involved. One level of involvement for these organizations is a programmatic approach, such as performing lead testing, establishing no-drive days, documenting the problems and building education as a means to solve the problems. Furthermore, the need for partnerships was stressed, such as between schools and businesses, and between community groups and the scientific community.

Other specific recommendations included the need to involve local elected officials and educate them about environmental issues; to better enforce the existing laws that protect the community and environment; to develop ways to engage the community more effectively; and to close the gap between the grass roots and scientific communities to allow for more effective outcomes.

The Symposium allowed for different but valid perspectives. The event provided an opportunity for people who do not typically meet and communicate to have an opportunity to share information and resolve issues. Finally, the Symposium was a means to frame the issues which need to be addressed in the future, as identified by the community, educators and researchers alike.

OUTDOOR POLLUTION

Employee Commute Options: Differential Gains and Losses

by

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Towson State University
and

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Morgan State University

Symposium on Applied Research and Education Addressing
Urban Environmental Justice Issues Applicable to Baltimore, MD
October 21, 1995

Introduction

Rising incomes and access to the automobile in the United States have encouraged suburbanization of residence and work place. It is well established in the literature and confirmed by recent evidence that metropolitan areas in the U.S. have undergone decentralization of population and employment.¹ The majority of population and employment growth has occurred outside urban centers.

This decentralization has caused tremendous growth in suburb-to-suburb and city-to-suburb (reverse) commuting by single occupant automobile.² Decentralization has also left large concentrations of the inner-city poor and minorities in locations that are less accessible to employment opportunities, resulting in a "spatial mismatch" between housing and jobs. This spatial mismatch has on the one hand caused the tremendous growth in reverse commuting, and on the other hand resulted in a lack of access to employment for households without automobiles. Previous research has shown that many jobs in the suburbs are beyond the reach of the low-wage urban labor force.³ Such labor often can not afford the high cost of automobiles and the dispersed nature of job growth makes mass transit from inner-city neighborhoods inconvenient. Approximately 70 percent of a sample of unemployed city residents did not own an automobile and many of them were unwilling to commute to suburban jobs or perceived the automobile as necessary for the reverse commute. However, low-wage labor aspires to automobile ownership as do other income groups.

Suburbanization and the dominance of automobiles in metropolitan commuting has led to problems in air quality and traffic congestion. Most urban areas in the late 1980s violated air quality standards established by Congress in 1970. The Clean Air Act Amendments of 1990 (CAAA) imposed high standards on urban smog, automobile emissions, toxic air pollutants, and

acid rain. Congress set "policy beyond capability."⁴⁵⁶⁷ While most of the CAAA was concerned with the technical side of air pollution, the fourth section contained a largely unnoticed leap in "action-forcing" environmental legislation. This section mandated change in social behavior--that people change the way they go to work. It also moved from direct regulation of the polluter to indirect regulation through a third party, the employer. Only 2 of the 500 pages of legislative history in the public record, which includes both the Senate Report and the House Conference Report, were devoted to the ride sharing requirement. Only one study was cited concerning the costs or benefits of the provision. No information about what influences people's mode of commuting, the duration and length of the average commute, nor what motivates people to change their commuting behavior was incorporated into the requirements. No consideration was given to the trends in location of jobs and housing, nor to the required flexibility of the labor force which is assumed by the economy. Congress failed to consider that changing people's behavior, especially deep-seated routinized daily behavior such as commuting, may be extremely difficult, costly, inequitable, and have wide-reaching unintended implications on settlement patterns and the economy.⁸⁹

The Employee Commute Options (ECO) legislation, also known as Employee Trip Reduction (ETR), requires states with extreme and severe ozone non-attainment areas to develop regulations designed to reduce the number of vehicles used by people commuting to work. At a minimum, state regulations must require all employers of 100 or more persons to increase their average vehicle occupancy (AVO) of employees morning commuting trips in the region by 25 percent. The intent was to reduce the number of vehicles on the road during rush hours and the time the remaining cars spend idling or operating at inefficient low speeds¹⁰. States were to submit regulations to the Environmental Protection Agency by November 1992 for approval and to meet target AVOs by November 1996.

The ECO/ETR requirements affected 10 metropolitan areas in 11 states, including Baltimore and Philadelphia. About 5,600 employers had large employment sites in Delaware, Maryland, New Jersey and Pennsylvania, and these sites employed about 3.6 million people. Each state developed its own regulations within overall federal guidelines, and each company developed its own plan for meeting the state defined target. State regulations and employee plans have the potential of affecting different employers and employees in different ways. These can discourage single occupancy driving, but they also can encourage continued suburbanization of employers and the migration of employment from the affected metropolitan areas. Plans can benefit those with greater access to transit or carpools, but can also present a financial burden for low-wage employees. Plans can provide greater work schedule flexibility to all employees, but can also benefit only those in professional or technical positions. The ECO/ETR legislation is unlikely to affect all employers and employees equally, and could just hurt those at the initial stages of participating in the suburban economy and in automobile use. Many are questioning if it has any effect on air quality or traffic congestion.

The objective of this research paper is to evaluate the known and potential impact of the ECO/ETR legislation which requires employers to develop transportation demand management

programs. It is based upon preliminary findings from a study of the Economic and Social Impact of the Employee Trip Reduction Requirements of the Clean Air Act Amendments of 1990.¹¹ This study has involved about 100 randomly selected private employers in the Philadelphia and Baltimore nonattainment areas.

Philadelphia Severe Ozone Nonattainment Area

The Philadelphia Nonattainment Area has at its center the Delaware Valley Region of Pennsylvania and New Jersey (DVR). The DVR consists of the Pennsylvania Counties of Philadelphia (including Center City Philadelphia), Delaware, Chester, Montgomery, and Bucks and the New Jersey Counties of Gloucester, Camden, and Burlington. The other counties in the nonattainment area, New Castle and Kent, Delaware; Cecil County, Maryland, and Salem and Cumberland, New Jersey; bound the DVR on the south.

Employment and Commuting Trends

According to a study of journey-to-work trends by the Delaware Valley Regional Planning Commission (DVRPC), the DVR is a mature urban region that is growing slowly and, as is typical of other metropolitan areas, continues to decentralize.¹² The shift in workers and jobs in the DVR has resulted in significant changes in commuting patterns over the 1980 to 1990 period.

Approximately 59 percent of the 2.4 million workers in the region travel from suburban residence to suburban job. Work trips from Pennsylvania suburbs to Pennsylvania suburbs grew by 21 percent, while work trips from Pennsylvania suburbs to New Jersey suburbs grew by 74.6 percent. Work trips from New Jersey suburbs to New Jersey suburbs grew by 21.3 percent. The number of workers reverse commuting from Philadelphia increased by 44 percent to the Pennsylvania suburbs and by 59 percent to the New Jersey suburbs. Workers commuting to jobs outside the region increased by 50 percent.

Means of Transportation to Work

Over the period 1980 to 1990 the use of single occupant vehicles (SOVs) increased greatly and ride-sharing declined. The number of workers driving alone increased 33 percent, resulting in a modal share of 68 percent in 1990. The number using carpools or vanpools declined by 22 percent down to a modal share of 12 percent. Public transportation use declined by 4 percent for a modal share of only 11 percent.

The means of transportation to work of course vary by level of urbanization in the region. SOV use ranges from over 70 percent in the suburban counties to just 41 percent in Philadelphia. Chester and Montgomery counties have the lowest shares of carpool/vanpool use and Philadelphia, Camden, and Mercer have the highest shares. The use of transit ranges from a low of only 2 percent in Gloucester County to 28 percent in Philadelphia.

Ridership on individual public transportation modes has exhibited some surprising trends.¹³ While overall transit ridership declined 4 percent, ridership on buses and trolley (light rail) lines increased 3 percent during 1980 to 1990.¹⁴ The major losses occurred on the regional (commuter) rail lines, where ridership fell by 20 percent. Some of the stated reasons are: cutting of service on some lines, fare increases, and service disruptions.

In the other nonattainment counties the modal shares for commute trips correlate with their suburban or exurban development characteristics. According to the 1990 Census of Population and Housing, all the counties have very high levels of SOV use, over 75 percent. Large declines occurred in carpooling and public transportation use between 1980 and 1990 with the exception of increases in public transportation use in the New Jersey counties. The New Jersey counties have benefited to some extent from more developed mass transit networks.

Baltimore Severe Ozone Nonattainment Area

The Baltimore Nonattainment Area consists of the Baltimore Metropolitan Area: City of Baltimore and the counties of Anne Arundel, Baltimore, Carroll, Harford, and Howard. The Maryland counties of Metropolitan Washington, DC bound the Baltimore Area to the south and west and comprise a serious nonattainment area.

Employment and Commuting Trends

The Baltimore Metropolitan Area has experienced growth in employment but a decentralization of growth.¹⁵ The realignment of labor and jobs over the metropolitan area's geography and the concentration of development in suburban activity centers have fundamentally influenced commuting patterns. Between 1980 and 1990 the number of workers in the metropolitan area commuting from suburb-to-suburb increased by 41.7 percent, while the number commuting from suburb-to-city declined by 9.5 percent. Because of the increase in workers but slight decline in jobs in Baltimore City during the 1980s, city-to-suburb commuting experienced the largest relative increase of 48.0 percent. Thus, the reverse commute has become a significant component of the commuting pattern.

Means of Transportation to Work

The percentage of workers in the metropolitan area driving alone grew from 59.8 percent to 70.8 percent between 1980 and 1990, while the percentage of commuters in car/vanpools declined from 22.3 percent to only 14.1 percent. The use of transit declined from 10.0 percent to 7.8 percent of all commuters. Within transit, bus and streetcar use declined by one fifth (21%) but subway, elevated, and railroad use increased 4-1/2 times (449%).

The modal shares varied tremendously within the metropolitan area, depending on the level of urbanization and location. Workers in Baltimore City using SOVs were 50.9 percent of the total in 1990, while ride-sharing was 16.8 percent and transit use was 21.5 per cent. In Howard

County, a county on the suburban fringe between Baltimore and Washington, DC, SOV use was 80.9 percent, ride-sharing was 11.9 percent and transit use was only 2.2 percent.

State Regulation Differences

EPA issued guidance rather than regulations for ECO/ETR, and this guidance was published after the date originally set for the states to submit plans. The resulting ambiguity and delay led to variability among states, as state agencies tried in different ways to develop and negotiate the least onerous ECO program for their employers which would still meet federal legislation. Since the causal link between changing commuting behavior and a reduction in ozone pollution was not effectively argued by Congress, businesses and those responsible for formulating state regulations began to question this causal relationship.¹⁶ Arguments began to surface that getting people out of their car would have a limited impact on air quality and would hurt businesses.¹⁷¹⁸

Initially, one of the main forms of variability among states was in the number of Average Vehicle Occupancy (AVO) zones into which they divided their metropolitan areas. Individual employers had target Average Person Occupancies (APO) generally 25 percent higher than the AVO for the zone at the time the regulations were developed. Target APOs ranged from 1.30 persons per car in southern California to 8.81 persons per car in Manhattan. Four of the 10 regions had multiple AVO zones for both calculating baseline statistics and setting target compliance standards. Generally, the multiple zones were the 1) urban core, 2) other urban areas, and 3) suburban areas. When a fourth zone was included, it was usually either another urban core (central business district) or a rural zone. Two regions included one zone for baseline statistics, but multiple zones for target compliance. Five regions included a single zone for both the baseline statistics and target compliance. The differences between target APOs within a single non-attainment region also varied. The target APO for Houston's urban core was only 4 percent greater than that for the remainder of the region. On the other hand, the target APO for the New York urban core was 6 times that for the suburban and rural rings.

Within the Philadelphia metropolitan area, Pennsylvania defined four AVO zones (target APOs of 3.00, 1.75, 1.58, and 1.50). Delaware defined two targets (APOs of 1.50 and 1.45). New Jersey defined one target (APO of 1.38). Maryland adopted a system in which the target APO varied for each Philadelphia region employer based upon a baseline employee survey. In the Baltimore metropolitan region, Maryland defined target APOs for transportation districts (generally a census tract or group of tracts) with the APOs for employers new since the 1990 census based upon a baseline employee survey.

The basic argument for multiple AVO zones is that the urban core has a concentration of employment and residences that makes it well-served by public transit and easier to arrange ride sharing. The suburban fringes, on the other hand, have very low densities of employment and residences. The dispersed employment sites are poorly served by public transit and make it difficult to arrange ride sharing. Therefore, even though the urban core already has a greater proportion of its workforce using transit or ride-sharing, it has a greater potential to increase that

proportion and should share in the regional efforts to reduce solo commuting.¹⁹ The counter argument is that the cost of commuting into the urban core is already greater than commuting to suburban locations. Parking is scarce and expensive in the urban core while abundant and generally free in the suburbs. The greater road congestion in the urban core already exacts a time cost. Public transit and ride sharing take more time than driving alone and exacts a cost in the lack of privacy and control. These costs are already borne more by urban core than suburban employers and employees, and adding to these costs would encourage urban core employers to relocate to the suburbs where they and their employees do not bear these costs. Since the regulations are designed to reduce pollution from automobile emissions, employers who have chosen to locate in low density suburban areas, which can only be reached by private automobile, should bear the greater proportion of the costs of the pollution to which they have given rise. Thus, a single AVO zone benefits urban core employers and multiple AVO zones with great differences between their targets benefit suburban employers.

States had flexibility in the number of AVO zones into which they divided their nonattainment areas. This was a political process which can be illustrated by the Maryland experience. The director of the Maryland ECO program opened the public hearings on one draft of the proposed regulations by stating the agency was "seeking input on the draft regulations in general, and particularly on the delineation of the vehicle occupancy zones and baseline vehicle occupancy rates."²⁰ Half of the 18 people who testified addressed either the number of AVO zones, the calculation of individual APOs, or both.

Maryland initially proposed two AVO zones for the Baltimore metropolitan region. This soon increased to three AVO zones with boundaries such that the target APO for the urban core would be 65 percent greater than the target APO for the suburban area outside the beltway. This core-suburban difference was the third greatest among all metropolitan regions affected by ECO. This reflects Baltimore's suburban employers being the first to organize and to comment on the proposed regulations through their transportation management associations. After the first official publication of the proposed regulations (3rd draft reviewed), the mayor of Baltimore argued during public testimony that three zones were unfair to employers in downtown Baltimore. The subsequent October 1993 draft reflected the interest of the urban core by defining a single AVO zone. The next draft reflected a compromise defining the target APO as an absolute rather than a relative increase (benefitting those with higher baseline APOs) over the employer's initial APO rather than a large zone average (benefitting those with lower than average APOs), and establishing a ceiling APO which did not have to be exceeded (benefitting those with high baseline APOs). However, this compromise could punish employers who took steps to decrease single commuting prior to the required baseline measurement. Maryland's final regulations used a "floating APO" system, whereby each employer had a target APO which was a fixed increase over the 1990 census average for their Transportation District (a census tract or group of census tracts) or upon a baseline survey if they were new to the Transportation District, with a ceiling.

Our study contacted 260 private sector employers in the two metropolitan regions, randomly

selected from strata defined by state, type of company, and number of employees. Initially, about half of the companies we contacted agreed to participate in our study. During the course of our study contacting companies, Pennsylvania suspended its program, Maryland delayed and then suspended its program, and Delaware and New Jersey revised their programs. After these changes by the states, fewer companies agreed to participate in the study. If they were not going to have to do anything to comply with the regulations, why spend the time participating in a study of a non-meaningful issues? In all of the authors' contacts, only one company expressed an anticipation of gaining more from the ECO/ETR program than it would cost. This company used the state ECO/ETR regulations to secure a reduction in required parking spaces required by local zoning and construction permits for a new building. At this point, just over one-third (37%) of the initially contacted companies have agreed to participate. Participation in the study, however, does not necessarily mean participation in the program. Only 41 companies at this time have actually supplied data to the study: employee survey data, organizational survey data, or the plan submitted to the state. Few Maryland and Pennsylvania employers are conducting surveys to find out where they currently are, and none have submitted a plan to the state. Many NJ and DE companies, although theoretically required to have done an employee survey and to have submitted a plan to the state, have not yet provided the study with their data. However, analysis of the information we have so far provides some interesting suggestions.

Table 1. Number of Study Companies by Percent Increase Needed to Reach Target AVO						
State	>45%	31-45%	16-30%	1-15%	Above Target	Employers with data
Delaware	0	6	2	1	1	10
Maryland	0	0	0	1	0	1
New Jersey	0	3	4	6	1	14
Pennsylvania	1	1	0	0	0	2
TOTAL	1	10	6	8	2	27

On the average, employers have to increase the average employees per vehicle by 25 percent, but the required change for any single employer is dependent upon the AVO zone target and upon the way employees get to work at the beginning of the program. Two of the 27 companies submitting baseline APO data to the study were already above their target. (See Table 1.) One was in Delaware and the other in New Jersey, both employing low skilled workers at low wages. One was located on a bus line with a nearby stop, and the other was close enough to employees' residences for them to walk. One was nonprofit providing extra support services to employees. The other was a food products plant with a substantial immigrant employee base. One of the 27 companies has to more than double its APO to meet the target, and another has to increase its APO by 44 percent. Both of these are large companies in downtown Philadelphia and assigned

the highest APO target in the region. From this small sample of companies, it appears that nonprofit companies have a greater gap than for-profit companies between their baseline and target APOs, unionized companies have a greater gap than non-union companies, and Delaware companies have a greater gap than do New Jersey companies.

At this point many employers are concerned about the costs of the ECO/ETR regulations, and the unfairness of their having to comply while companies in neighboring jurisdictions do not. Several companies have mentioned they are seriously considering areas outside the metropolitan nonattainment areas to move their current operations or to expand operations. Environmental regulations inconsistently implemented can place businesses in a competitive disadvantage, and have the potential to aggravate the problem they are designed to reduce.

Survey of Employees in Nonattainment Areas

A survey of 4,452 employees at firms in the two nonattainment areas asked questions regarding commuting habits, attitudes toward protecting the environment and socioeconomic characteristics of employees. Of the surveyed employees 71 percent were 44 years of age or under and 62.9 percent had less than a college education. Sixty and one-half percent of employees were in skilled or semi-skilled occupations and the remainder were in professional/administrative occupations. Employees that had less than \$25,000 in annual household income comprised 23.7 percent of the respondents, while 39 percent of employees had \$25,000 to \$49,999. Those who had \$50,000 or more were 37.4 percent of the total.

One question asked how influential would actions taken by employers be in encouraging ride-sharing or transit use. According to frequency distributions of the responses, the two most important actions were compressed work week (10 hours for four days) and offering guaranteed rides home for an emergency if employees had to work late. For compressed work week 65.5 percent stated that it would be somewhat or very influential, while for guaranteed ride home 57.7 percent stated that it would be somewhat or very influential. About half of all surveyed employees stated that flexible work hours, telecommuting sometimes from home, and providing of vans for van pools would be somewhat or very influential. Providing carpool location assistance, preferential parking at work, transit information, prepaid public transit, shuttles from transit stations, and on-site day care facilities had very little or no influence.

Correlation and cross-tabs analyses revealed that the responses to questions on influence and current commuting behavior only sometimes varied by gender, age and household income. Compressed work week and flexible work hours would have greater influence on women, those between the ages of 25 and 44 years, and with incomes of \$50,000 or greater. Guaranteed ride home would have much greater influence on women than men and would have almost equal influence among the income groups. The influence of more flexibility in work times and guaranteed ride home on women's mode choices is understandable given women's child care and other household responsibilities.

Those employer actions that had very little or no influence in general did not vary significantly by gender, age and income but with some exceptions. Preferential parking would have a somewhat greater influence on those with incomes of \$25,000 or less. Transit information also would have a greater influence on those with incomes of \$25,000 or less. Employer prepaid transit would have a much greater influence on the young and particularly those with incomes of \$25,000 or less.

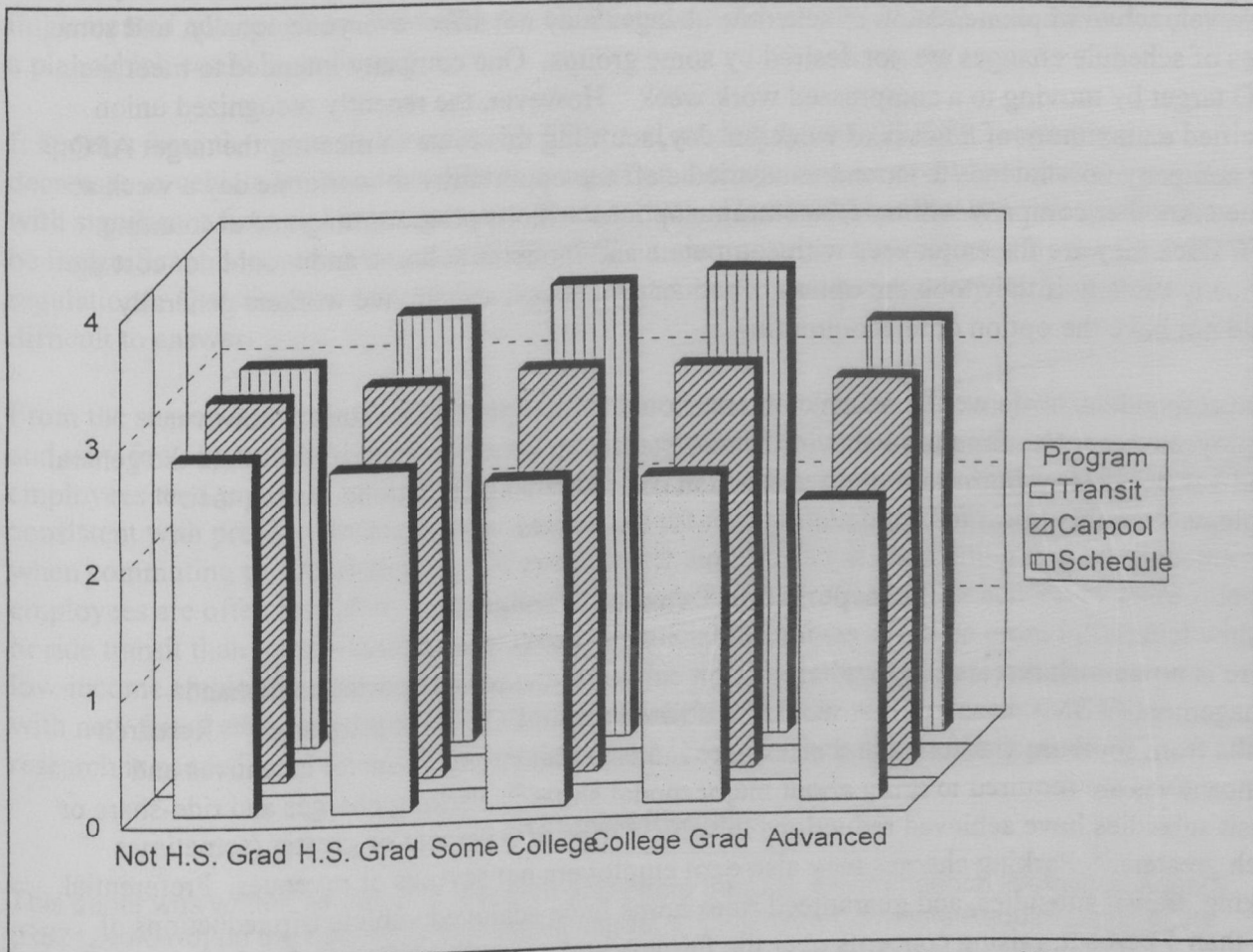


Figure 2. Likelihood Employees Will Be Influenced by Different Types of Program, by Education

All of the individual potential actions employers can take to reduce solo commuting fall into three categories that can be defined as transit programs, carpooling programs, and scheduling programs. (Results of factor analysis and reliability scaling analysis are available from the authors.) Programs which involve changing employee work schedules have the potential to influence the most employees, with a 3.5 average on a 1-5 scale of influence. Carpool programs are less likely to influence change, with a 3.2 average. Transit programs are the least likely to influence change, with a 2.6 average on a 5-point scale. Employees with different characteristics give different responses on the likelihood they would be influenced by different

types of programs. Education has the greatest relationship. (Figure 1.) Those without high school degrees are more likely than those with advanced or professional degrees to be influenced by transit programs (2.8 and 2.4 respectively) but are less likely to be influenced by schedule change programs (3.0 and 3.3 respectively). Those with college baccalaureate degrees are the most likely to be influenced by schedule change programs. Carpool programs affect everyone about equally.

However, actual implementation of schedule changes may not affect everyone equally, and some types of schedule changes are not desired by some groups. One company intended to meet their APO target by moving to a compressed work week. However, the recently recognized union specified a maximum of 8 hours of work per day, scuttling this route to meeting the target APO. The company now intends to extend to salaried staff the opportunity to work one day a week at home. Another company will try telecommute options with its programming and accounting staff, since they are the employees with computers and modems at home and would not cost the company directly if they took the option. Product production and service workers generally could not have the option of telecommuting.

What respondents state would influence them should be accepted with caution, however. Employees current commuting behavior is consistent with general societal levels, and the general trend has been away from carpooling and transit use. To change this trend among their employees would appear to be a daunting task for employers.

Transportation Demand Management

There is now much research in the literature on employer-based transportation demand management (TDM) measures that would be utilized for an ECO/ETR program.²¹²² Research results from southern California and elsewhere indicate that strong financial incentives and disincentives are required to bring about major modal shifts.²³ Parking charges and ride-share or transit subsidies have achieved reductions in vehicle trips of 5 percent or greater (sometimes much greater).²⁴ Parking charges may also earn employers net savings or revenues. Preferential parking, transit subsidies, and guaranteed rides home have achieved vehicle trip reductions of less than 5 percent, raising concerns over the fairness and cost effectiveness of such measures in improving air quality.

Modelling efforts in the Philadelphia and Baltimore Nonattainment Areas support these findings. The DVRPC modelled an ETR program consisting of parking charges, transit subsidies, ride-share matching, and other services.²⁵ An ETR Program and additional monetary costs imposed on SOV users are the most cost effective in reducing SOV use, but the DVRPC acknowledges the political difficulties of imposing user charges on employees. The Baltimore Metropolitan Council modelled ECO program, using a likely strategy of preferential parking for HOVs, ride-share matching and flexible work hours, achieved very modest results.²⁶

Conclusions

Perhaps the most expedient political way to avoid the controversies of who is hurt most by environmental regulations is to suspend environmental regulations, or make them voluntary. This is the approach eventually taken by Maryland and Pennsylvania. Although Baltimore region participants were selected from among those who had indicated a desire to start a voluntary ECO/ETR program before required to, none of these companies have actually implemented any program. Several have conducted employee surveys, but none have developed a plan which could be reviewed.

It appears from the research literature on TDM and modelling of ECO/ETR programs that decreases in vehicle trips and benefits to congestion management around work sites are possible with significant financial incentives and disincentives. However, the impact on air quality may be insignificant because of the potentially small number of urban trips affected by the ECO/ETR regulations. Questions on fairness to employers and employees become key issues and are difficult to answer.

From the survey it is clear that even among low-income employees a large majority drive alone and very few use transit or share-rides. Clearly the common misconception that low-income employees tend to use or are more likely to use transit is not necessarily the case. This result is consistent with previous research regarding use of the automobile by low-income city residents when commuting to suburban jobs. Of even greater significance is the finding that low-income employees are often less likely to be influenced by rather modest employer actions to share-rides or ride transit than upper-income employees. Financial incentives could be more influential with low-income employees, however. It appears that low-income employees are reluctant to part with new found economic freedom to use the automobile for commuting to work. Further research is needed on the socioeconomic impacts of ECO/ETR on the working poor.

Acknowledgements

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Abstract:

The Ozone Pollution Map: A Technology-Based Approach to Improved Public Awareness of the Nature of Ground-level Ozone Pollution and To Greater Acceptance of Effective Control Measures

The Baltimore region suffers with the fifth worst air pollution in the Nation. In Baltimore, the problem is ground level ozone air pollution. Ozone is a powerful lung irritant. Children, the elderly, persons with lung disease, and individuals engaged in strenuous work out of doors are particularly vulnerable to the health effects of ozone air pollution.

The post-beltway suburban development patterns that contributed to population loss and erosion of Baltimore City's tax base are important contributors to the ozone pollution problem. Suburban sprawl, fostered and subsidized by highway oriented transportation planning, is dependent upon an automobile centered transportation system. As a consequence, mobile sources are the single largest contributor to Baltimore's ozone pollution problem.

Many suburban Marylanders mistakenly perceive ozone air pollution as a problem limited to Baltimore City or originating in the city. This misperception is abetted by the invisible nature of ozone pollution. In fact, ozone pollution is a region wide problem with the worst pollution recorded in outlying suburbs.

As a regional environmental problem, ozone air pollution affects the health of citizens throughout the Baltimore metropolitan area. However, the more severe health impacts fall disproportionately upon the socio-economically disadvantaged, largely centered in Baltimore City. The higher prevalence of asthma among African-Americans and deficiencies in health care delivery encountered within disadvantaged communities account, in part, for this disparity.

The American Lung Association of Maryland's Ozone Pollution Map:

To counter misperceptions of ozone air pollution as a City-based problem, to enable citizens to reduce their personal health risk from ozone air pollution and to foster greater public acceptance of effective pollution control measures, the American Lung Association of Maryland has developed an ozone pollution "weather" map.

The Ozone Pollution Map is a computer animated graphics presentation very similar to other maps presented in television weather reports. Illustrating actual ozone pollution levels throughout the region, the Ozone Pollution Map correctly

represents ozone as a region wide problem impacting the suburbs as well as the City.

Providing this important information in an accessible, understandable visual representation through a familiar, widely watched medium - daily television weather reports, the Ozone Pollution Map should be an effective means of educating the public regarding air pollution. The map, which began airing on WJZ Television in Baltimore on August 7th, provides viewers with timely, detailed information regarding ozone air pollution in their own communities and throughout the region.

Increased public awareness of the origin and nature of ground-level ozone through the Ozone Pollution Map and other outreach efforts is essential if we are to reduce this major health and environmental risk. Urban centers such as Baltimore could benefit from public acceptance of strategies to reduce ozone air pollution that include infrastructure-based control measures such as expanded mass transit and policy changes redirecting growth from the suburbs to the City.

The symposium presentation will include a demonstration of the Ozone Pollution Map technology.

CONTAMINANT LEVELS IN BALTIMORE HARBOR FISH AND CRABS

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MARYLAND DEPARTMENT OF THE ENVIRONMENT

BALTIMORE URBAN ENVIRONMENTAL JUSTICE SYMPOSIUM
OCTOBER 21, 1995

Fish, crabs, oysters and clams have the ability to concentrate chemicals from surrounding water and sediment into their tissues. Factors that affect the bioaccumulation of a particular chemical include the substance's solubility in lipids (e.g. PCBs accumulate in fatty tissue), the organism's synthesis of enzymes which contain certain metals (e.g. copper, zinc), and biological mechanisms in some organisms which actively sequester metals in certain biological compartments within the organism (e.g. metallothionein binding and metal granules). Some chemicals can be so water-insoluble that they are not detected in water. The same chemical can still accumulate in aquatic organisms because it is soluble in fatty tissue. These facts make fish, crabs and shellfish good indicators of environmental pollution in a body of water such as the Baltimore Harbor. This is one of the reasons the Maryland Department of the Environment (MDE) monitors chemical concentrations in fish, crab and shellfish tissue. Tissue monitoring also allows MDE to determine if contaminant levels in fish and crabs are within limits established as safe for human consumption. In making the determination that fish and crabs are safe to eat, MDE evaluates all relevant data and uses its professional knowledge and experience.

How much of a chemical fish, crabs or shellfish accumulate depends on many variables, including:

- o The species (e.g. oysters will accumulate much higher levels of metals than fish),
- o The species' habits (e.g. fish which feed in bottom sediments will often have higher contaminant levels than other species),
- o Age (i.e. older fish will usually have higher contaminant levels than younger fish), and
- o The species' normal fat content - many contaminants (e.g. nonpolar organic compounds or organo-metal complexes) accumulate in fat, so that fish species with more fat will often have higher levels of contaminants.

MDE now investigates levels of contaminants in fish tissue

in the Baltimore Harbor through a standard monitoring program called the CORE Fish Tissue Network (1) and through special studies (2). In the Fish Tissue Network, MDE measured levels of seven metals through 1988 (3): arsenic, cadmium, chromium, copper, lead, mercury, and zinc. Nickel and manganese were added in 1989, and silver and selenium in 1994 (4). In addition, MDE measures the following 17 organochlorine pesticides: aldrin, alpha-BHC, gamma-BHC (lindane), chlordane, dacthal, DDD, DDE, DDT, dieldrin, endosulfan, endrin, hexachlorobenzene, heptachlor, heptachlor epoxide (a degradation product of the pesticide heptachlor), methoxychlor, mirex, toxaphene and PCB aroclors. This list was expanded in 1993 (4). Very low laboratory detection levels (parts per billion) are used to capture chemical concentrations.

Currently, Maryland's fish tissue monitoring program divides state waters into three groups: 1) Western Maryland watersheds, 2) Chesapeake Bay watersheds, and 3) Baltimore/Washington urban watersheds. Samples from within each of these areas are sampled every three years. This sampling frequency is based on MDE's experience that tissue contaminant levels change gradually over time. Two finfish species are collected at each site: an accumulator species and a game species. For the accumulator species, a fish which both is high in fat content and feeds on detrital material in the bottom sediments is selected, in order to ensure that the species with the greatest likelihood of accumulating most contaminants is analyzed. An example of an accumulator species is the channel catfish. The game species chosen is a popular sport fish such as the white perch. Species which reside at the collection site with little migratory behavior are selected for both the accumulator and game species

As part of MDE's Fish Tissue Network, Baltimore Harbor is generally sampled on a triennial basis (5); the most recent data available were collected in 1990 for Baltimore Harbor. The target species for both areas are white perch (game species) and channel catfish or brown bullhead (accumulator species). An intensive finfish survey was conducted in both water bodies in 1985. The species collected include white perch, channel catfish, American eel and brown bullhead (6). Crabs are generally sampled on a five year schedule.

In describing potential or actual risk to human health, the terms "contaminant" and "toxic" are widely used and often misunderstood. The presence of contaminants or toxic substances does not mean a threat exists to human health. All substances have the potential to be contaminants and to cause toxicity. Substances considered relatively harmless or even beneficial, such as vitamin C, may be harmful i.e. "toxic" if consumed in very large quantities or on too frequent a basis. Alcohol is another example: one drink per week is considered harmless while several drinks per day can cause liver disease.

Whether or not a substance exerts toxicity depends on both the concentration (dose) and the duration of the exposure. For example, because of the difference in alcohol content (dose), consumption of a shot glass of whiskey each day is more harmful than consumption of a shot glass of beer each day. Similarly, consumption of a shot glass of whiskey each day is more harmful than a shot glass of whiskey once each week. In evaluating potential health risk, various factors such as the rate of consumption of the food of concern, the other foods consumed, the age and health of the individuals most likely to be affected and a host of other factors need to be considered.

Criteria for the public health risk evaluation of data on contaminants in fish tissue are available primarily from two sources: the U.S. Food and Drug Administration (FDA) and the U.S. Environmental Protection Agency (EPA). The FDA enforces Action and Tolerance Levels through their monitoring of fish and shellfish in interstate commerce. These values exist for fish or shellfish for one metal (methylmercury) and 13 organic substances. Additionally, the FDA has published a set of guidance documents on five other metals (arsenic, cadmium, copper, nickel and lead). The EPA also has published guidance documents, which present screening levels for preliminary evaluation of fish tissue data in terms of human health needs (7).

For the purposes of this report, screening level values were obtained from the FDA Action and Tolerance Levels and the FDA guidance documents for metals. The FDA has long been the agency responsible for the protection of foodstuffs for public consumption. The FDA guidance documents, in particular, include comprehensive risk characterizations for each metal, including descriptions of bioavailability and toxicity in seafood, in addition to a description of methodology for the assessment of risk to consumers. In contrast, EPA's guidance simply presents values calculated using readily available toxicity values and default assumptions, which may not apply to the situation at hand, and may lead to over or under estimation of risk. For example, one EPA default assumption is complete absorption of a chemical from the gastrointestinal (GI) tract; in the case of cadmium, however, substantial human data indicate the average GI absorption is only 5%. Therefore, using this EPA assumption could lead to overestimation of risk.

The screening levels used for the five metals are the most protective of those presented for each metal in the FDA documents for children, pregnant women and adults. These levels were derived under the assumption that consumption of the species being evaluated (e.g. crabs) is at a rate of approximately 1.25 lbs/month (15 lbs/year) for adults and 2/3 lb/month for children. A national food consumption survey indicated that 90% of Americans who consume crustacean shellfish eat less than this

amount (8).

Although tissue data are available for copper and zinc, FDA has not issued guidance or Action Levels for these metals. Both substances are essential nutrients of the human diet, and may exert toxicity only at very high levels of intake, e.g. more than 15 mg copper/person/day (9).

In 1983, a large survey of contaminants in blue crabs from Baltimore Harbor and other Chesapeake Bay tributaries was conducted (2,10). A second survey, not yet published by MDE, was conducted in 1990 and included sites in Baltimore Harbor (4). These blue crab data for the Harbor are summarized in Tables 1 and 2, and compared to the screening levels described above (11).

Table 1 presents organic contaminants data (11). In the 1983 Baltimore Harbor collection, only one organic contaminant exceeded a screening level; one of six blue crab tissue samples in 1983 exceeded the screening level for chlordane. In the 1990 blue crab survey, there were no organic contaminants which exceeded screening levels.

Table 2 presents metals data (11). The only metal in blue crab tissue which exceeded a screening level was lead. Forty-two of the 65 crab samples from the Harbor analyzed in 1983 exceeded this screening level (for children 2-5 years old), while 13 of the 16 crab samples analyzed in 1990 exceeded it. None of the Harbor crab samples collected in 1983 or 1990 exceeded the lead screening level for adult consumers. Blue crabs will be collected again from the Baltimore Harbor in 1995.

A screening level is a very conservative concentration estimate which, when clearly exceeded, calls for closer scrutiny of the contaminant data and the actual potential for public health risk. The screening level used for lead, derived specifically for children 2-5 years of age (to provide protection from potential developmental effects), is very conservative and is based upon several "worst case" suppositions. The use of this screening level implies an assumption that crabs from Baltimore Harbor are consumed by a child 2-5 years of age at the rate of 2/3 of a pound of crab meat per month during an average four-month crabbing season. This appears to be a very high crab-consumption rate for a young child.

MDE has carefully examined the available data on lead in crabs from Baltimore Harbor and the toxicological data on lead. The data were also examined with respect to the current status of lead poisoning in children in Baltimore. Even using "worst case" exposure assumptions (i.e. assuming that a child eats about 190 crabs/year), the lead in crabs would represent a relatively minor contribution (less than 15%) to the blood lead level of the average inner-city child. The vast majority of lead exposure for

city children is attributable to incidental ingestion of the lead present in dust and soil. MDE has concluded that the levels of lead seen in crabs from Baltimore Harbor do not significantly increase the risk of lead poisoning to Baltimore's children (11).

The lead detection level for the previously collected data (0.5 ppm) was very close to the screening level for small children (0.6 ppm). Some exceedances of the screening level may be due to the imprecision which surrounds measurements made at the detection level. Since the 1990 crab and finfish collections, MDE's laboratory has begun using another analytical method, for which the detection level is more sensitive (0.05 ppm). The Department's routine tissue-monitoring program is scheduled to re-survey contaminants in crabs from Baltimore Harbor during the summer of 1995. The new, more sensitive analytical method for lead (0.05 ppm) will be used in this effort to provide more accurate data for future evaluations of the potential for public health risk and determinations concerning the need for public health advisories.

Table 2 permits comparison of 1983 with 1990 metals levels in Baltimore Harbor blue crab tissue (11). Of the metals shown, cadmium and chromium show a marked decrease in concentration. Levels of arsenic and mercury observed in 1983 and 1990 are similar, although each is slightly lower in 1990. In a comparison of the 1983 and 1990 average contaminant levels in blue crabs from several Chesapeake Bay tributaries, it was observed that lead concentrations declined between 1983 and 1990 in crabs from all areas sampled in those two years (5).

Garreis and Murphy (2) reported no statistically significant differences between Baltimore Harbor crabs and those from other Chesapeake Bay tributaries in 1983 for tissue levels of zinc and cadmium. Mercury levels were slightly higher in Baltimore Harbor crabs, while arsenic levels were significantly lower in Baltimore Harbor crabs than those from other tributaries. Blue crab lead and chromium levels were similar between the Harbor and other Chesapeake Bay tributaries. Copper levels in 1983, however, were significantly higher in Baltimore Harbor crabs than those from most other tributaries (2). When compared to individual Chesapeake Bay tributaries, recent copper levels in Baltimore Harbor crabs, while greater than those in some tributaries, appear to be similar to the levels seen in crabs from other western shore tributaries (4).

In 1985, a large survey of contaminants in finfish from Baltimore Harbor was conducted (6). Although not yet published by MDE, fish were analyzed for other organochlorine insecticides and PCBs, in addition to chlordane (4). Since then, smaller collections have been performed as part of MDE's Fish Tissue Network in 1990 and 1994. Because the 1994 sample data are not yet available, and because it would be inappropriate to compare

the single composite samples of white perch and brown bullhead and channel catfish fillets collected in 1990 to the more robust data set from 1985, only the 1985 data are summarized and compared to the screening levels in Table 3 (11).

In the 1985 Baltimore Harbor finfish collection, two of the organic contaminants, chlordane and PCBs, exceeded the screening level for some substances (Table 3). While no brown bullheads and only two of the 31 white perch exceeded the screening level for chlordane, it was exceeded by approximately half of the American eel samples and by three-quarters of the channel catfish samples. The PCB screening level was exceeded by only one of the 19 American eel samples (11).

Metals data for Baltimore Harbor finfish fillet samples from the 1985 and 1990 collections are summarized in Table 4, in comparison to the screening levels described above (11). The only metal which exceeded the screening levels in finfish tissue was lead. While no Harbor finfish samples (1985 or 1990) exceeded the lead screening level derived for the protection of adults, 1985 samples from two species exceeded the new FDA guidance for young children.

The one white perch sample (a composite of fillets from ten fish) analyzed in 1985 exceeded this screening level, while the white perch sample analyzed in 1990 (composited from five fish) did not. All eleven American eel samples collected in 1985 exceeded the children's lead screening level. The explanation may be that bone is the primary repository for lead, and the eel samples were analyzed without filleting (i.e. with all bones). Secondly, the lead screening level for children 2-5 years old is derived using the assumption that these children are consuming these fish species from the Harbor at a rate of eight pounds a year.

In 1986, the Maryland Department of Health and Mental Hygiene (DHMH) reported concentrations of the pesticide chlordane in fish from Back River and Baltimore Harbor that exceeded the FDA Action Level of 0.3 ppm (6). On February 5, 1986, an advisory was issued against the consumption of American eel (*Anguilla rostrata*) and channel catfish (*Ictalurus punctatus*) from Back River and Baltimore Harbor, as well as black crappie (*Pomoxis nigromaculatus*) and carp (*Cyprinus carpio*) from Lake Roland (12). The advisory suggested that persons limit or avoid eating channel catfish and American eels from these areas. Pregnant women and children were especially cautioned. This advisory continues in effect today.

Chlordane is a man made chemical that was used as a pesticide in the United States from 1948 to 1988. It is extremely persistent in the environment. Chlordane may travel long distances attached to soil particles and be deposited on land or

in water far from its source. Prior to 1978, it was widely used on agricultural crops, lawns, home gardens and to protect homes and other structures from termites. Because of concerns over possible cancer risk, environmental persistence and possible danger to wildlife, EPA canceled chlordane use on food crops and phased out other above ground uses over the next 5 years. In 1988, EPA canceled all use of chlordane in the United States. The chlordane we find today in Baltimore Harbor fish tissue is the remains of the historic application of chlordane in this watershed. Gradually the levels are decreasing as the chlordane disintegrates over time or is buried in sediments.

In 1993, a survey of contaminants in softshell clams from the mouth of Baltimore Harbor was conducted (4). The area sampled was off the Anne Arundel County shoreline, east of Rock Point, and is open to commercial clamming. None of the samples shown in Tables 5 and 6 exceeded the screening criteria for organic or inorganic contaminants (11). Clams are obtained from this site only by commercial clamming rigs and, once on the market, are mixed with clams from elsewhere in Maryland.

Conclusion

Most edible fish, crabs and shellfish from the Baltimore harbor exhibit measurable levels of some toxic metals and toxic organic chemicals. With the exception of the chlordane threshold in two finfish species and the lead screening value for consumption by young children in samples taken from blue crabs and american eels, generally contaminant levels in fish, crab and shellfish tissue do not exceed public health thresholds. The species sampled in the 1990s show generally reduced levels of contamination, compared to levels seen in samples of the same species taken in the early 1980s.

Table 1. Organic Chemical Concentrations in Baltimore Harbor Blue Crabs Compared to Screening Values.

	Aldrin & Dieldrin (ppm)	Chlordane (ppm)	DDT, DDE, & DDD (ppm)	Endrin (ppm)	Heptachlor & H. Epoxide (ppm)	Mirex (ppm)	PCBs (ppm)	Toxa-phene (ppm)
Screening Levels ¹	(0.3)	(0.3)	(5.0)	(0.3)	(0.3)	(0.1)	(2.0)	(5.0)
Blue Crabs (1983) ²								
# Exceedances/ # Samples	$\frac{0}{14}$	$\frac{1}{14}$	$\frac{0}{14}$	$\frac{0}{14}$	$\frac{0}{14}$	$\frac{0}{14}$	$\frac{0}{14}$	$\frac{0}{14}$
Range ³	<.0005-.027 ⁴	<.0005-.625	.009-.208 (combined)	all <.0005	<.0005-.177 ⁵	all <.0005	.076-1.162 ⁶	all <.01
Blue Crab (1990) ⁷								
# Exceedances/ # Samples	$\frac{0}{15}$	$\frac{0}{16}$	$\frac{0}{16}$	$\frac{0}{16}$	$\frac{0}{16}$	$\frac{0}{14}$	$\frac{0}{14}$	$\frac{0}{16}$
Range	<.001-.003 (combined)	<.0096-.122	<.012-.033 (combined)	all <.0023	all <.0029 (combined)	all <.01	.032-1.074	all <.124

¹These values for organic chemicals are the FDA Action Levels.

² In 1983 study, eight samples were 6-crab composites; the remainder were individual crabs. All muscle and hepatopancreas ("mustard") from each crab was included in each sample (Garreis & Murphy, 1988a). Since the mustard is the crab liver, which is known to concentrate many contaminants, its inclusion contributes significantly to contaminant concentrations of the sample.

³ The "less than" value indicates non-detect results and the value provided is the detection level reported in Garreis and Murphy (1986). After publication, the laboratory revised its estimate of detection levels for this data set as follows (4/15/88 memo from Garreis): dieldrin (.007), chlordane (0.01), DDT (.02), DDE (.07), DDD (.04), endrin (.004), heptachlor epoxide (.004), mirex (.05), toxaphene (.23).

⁴ Dieldrin only.

⁵ Heptachlor epoxide only.

⁶ All PCB values from this survey are considered overestimates (4/15/88 memo from Garreis).

⁷ In 1990 study, all samples were 6-crab composites. All muscle and hepatopancreas from each crab was included in each sample (D. Murphy, Pers. Comm.). Since the mustard is the crab liver, which is known to concentrate many contaminants, its inclusion contributes significantly to contaminant concentrations of the sample.

Table 2. Concentrations of Metal Contaminants in Baltimore Harbor Blue Crabs Compared to Screening Values.

	Arsenic	Cadmium	Chromium	Nickel	Lead	Mercury
Screening Values ^a (ppm, wet weight)	43 (children 2-5 yrs)	3 (all ages)	11 (all ages)	70 (adult consumers)	3.9 (adult consumers) 0.6 (children 2-5 yrs)	1.0 (all)
Blue Crabs (1983)⁹						
# Exceedances/ # Samples	$\frac{0}{38}$	$\frac{0}{65}$	$\frac{0}{65}$	No Data	$\frac{0}{65}$ $\frac{42^{10,11,12}}{65}$	$\frac{0}{82}$
Range (ppm)	<.01-0.29	0.12-1.13	<0.50-2.9		<0.50-3.70	.003-0.045
Blue Crab (1990)¹³						
# Exceedances/ # Samples	$\frac{0}{14}$	$\frac{0}{16}$	$\frac{0}{16}$	$\frac{0}{16}$	$\frac{0}{16}$ $\frac{13^{14,5}}{16}$	$\frac{0}{15}$
Range (ppm)	<.05-0.17	0.04-0.64	<0.50-0.60	0.21-3.34	0.50-2.60	0.014-0.031

^a These values for all metals, except mercury, reflect the most restrictive value calculated from FDA guidance using the 90th percentile consumption rate for crustaceans, i.e., approximately 15.3 lbs/yr Baltimore Harbor crab meat for adults, 13.6 lb/yr for children 5 yrs and up, and 8 lbs/year for young children 2-5 yrs. The screening value for mercury is the FDA Action Level, which is protective of all consumers.

⁹ In 1983 study, ten samples were 6-crab composites; the remainder were individual crabs. All muscle and hepatopancreas ("mustard") from each crab was included in each sample (Garrels & Murphy, 1986a). Since the mustard is the crab liver, which is known to concentrate many contaminants, its inclusion contributes significantly to contaminant concentrations in the sample.

¹⁰The FDA Guidance on lead in shellfish, which is the source of the lead screening values, was published in August 1993. Prior to that time, no federal guidance existed for lead in shellfish.

¹¹ Although more than half the samples exceed the screening level for young children (a preliminary assessment level), careful review of the contaminant and toxicological data for lead indicate that this does not represent a significant health hazard, when viewed in comparison with other exposure pathways for urban residents.

¹²The lead screening level of 0.6 is protective of children ages 2-5 who consume 8 lbs. of crabmeat (approx. 192 crabs) per year from Baltimore Harbor. Only 5 of 16 samples exceed the screening value for children ages 6 and up who consume 13.6 lbs. Baltimore Harbor crabmeat (approx. 326 crabs) per year. Just 3 of 16 samples exceed the screening value for pregnant women who consume 15.3 lbs. Baltimore Harbor crabmeat (approx. 365 crabs) per year. The screening value for all adults (3.9 ppm) is protective of adults consuming 15.3 lbs. of Baltimore Harbor crabmeat (approx. 365 crabs) per year.

¹³ In 1990 study, all samples were 6-crab composites. All muscle and hepatopancreas (mustard) from each crab was included in each sample (D. Murphy, Pers. Comm.). Since the mustard is the crab liver, an organ known to concentrate many contaminants, its inclusion contributes significantly to contaminant concentrations in the sample.

Table 3. Concentrations of Organic Chemicals in Baltimore Harbor Finfish Compared to Screening Values.

	Aldrin & Dieldrin (ppm)	Chlordane (ppm)	DDT, DDE, & DDD (ppm)	Endrin (ppm)	Heptachlor & H. Epoxide (ppm)	Mirex (ppm)	PCBs (ppm)	Toxaphene (ppm)
Screening Levels ¹⁴	(0.3)	(0.3)	(5.0)	(0.3)	(0.3)	(0.1)	(2.0)	(5.0)
White perch (1985) ¹⁵								
# Exceedances/ # Samples	$\frac{0}{31}$	$\frac{2}{31}$	$\frac{0}{31}$	$\frac{0}{31}$	$\frac{0}{31}$	$\frac{0}{31}$	$\frac{0}{31}$	$\frac{0}{31}$
Range	<.01-.017	<.004-.614	all <.13	all <.004	<.011-.021	all <.05	<.07-.92 ¹⁶	all <.23
American eel (1985) ^{17,18}								
# Exceedances/ # Samples	$\frac{0}{19}$	$\frac{9}{19}$	$\frac{0}{19}$	$\frac{0}{19}$	$\frac{0}{19}$	$\frac{0}{19}$	$\frac{1}{19}$	$\frac{0}{19}$
Range	<.01-.048	.08-.668	<.13-.142	all <.004	.013-.037	all <.05	.14-2.34 ³	all <.23
Brown bullhead (1985) ¹⁹								
# Exceedances/ # Samples	$\frac{0}{7}$	$\frac{0}{7}$	$\frac{0}{7}$	$\frac{0}{7}$	$\frac{0}{7}$	$\frac{0}{7}$	$\frac{0}{7}$	$\frac{0}{7}$
Range	all <.01	.02-.205	all <.13	all <.004	<.011-.012	all <.05	.07-.14 ³	all <.23
Channel Catfish (1985) ²⁰								
# Exceedances/ # Samples	$\frac{0}{4}$	$\frac{3}{4}$	$\frac{0}{4}$	$\frac{0}{4}$	$\frac{0}{4}$	$\frac{0}{4}$	$\frac{0}{4}$	$\frac{0}{4}$
Range	<.01-.027	.187-.858	<.13-.251	all <.004	<.011-.029	all <.05	.34-1.46 ³	all <.23

¹⁴These values for organic chemicals are the FDA Action Levels.

¹⁵ In this data set two samples are 10-fish composites; the remainder are individual fish. All samples are filets.

¹⁶ All PCB values from this survey are considered over-estimates (4/15/88).

¹⁷ A fish consumption advisory is currently in effect for American eel and channel catfish from Baltimore Harbor.

¹⁸ All American eel samples were individual organisms, which had been beheaded, skinned and gutted prior to analysis.

¹⁹ All brown bullhead samples are individual fish. All samples are filets.

²⁰ All channel catfish samples are individual fish. All samples are filets.

Table 4. Concentrations of Metal Contaminants in Baltimore Harbor Finfish Compared to Screening Values.

	Arsenic	Cadmium	Chromium	Nickel	Lead		Mercury
Screening Values ¹	43 (children 2-5 yr)	3 (all ages)	11 (all ages)	70 (adult consumers)	3.9 (adult consumers)	0.6 (children 2-5 yrs)	1.0 (all)
White perch (1985) ²							
# Exceedances/ # Samples	$\frac{0}{1}$	$\frac{0}{1}$	$\frac{0}{1}$	No Data	$\frac{0}{1}$	$\frac{1}{1}$	$\frac{0}{1}$
Range	0.20	1.10	<0.5		0.8		0.051
White perch (1990) ³							
# Exceedances/ # Samples	No Data	$\frac{0}{1}$	$\frac{0}{1}$	$\frac{0}{1}$	$\frac{0}{1}$	$\frac{0}{1}$	$\frac{0}{1}$
Range		<0.01	<0.5	<0.05	<0.5		0.019
American eel(1985) ^{4b}							
# Exceedances/ # Samples	$\frac{0}{12}$	$\frac{0}{11}$	$\frac{0}{11}$	No Data	$\frac{0}{11}$	$\frac{11^c}{11}$	$\frac{0}{14}$
Range	0.14-0.25	0.36-1.42	<0.5-1.1		1.2-3.2 ^l		.0040-.036
Brown bullhead (1985)							
	No Data	No Data	No Data	No Data	No Data		No Data
Brown bullhead (1990) ⁴							
# Exceedances/ # Samples	No Data	$\frac{0}{1}$	$\frac{0}{1}$	$\frac{0}{1}$	$\frac{0}{1}$	$\frac{0}{1}$	$\frac{0}{1}$
Range		<0.01	<0.5	<0.05	<0.5		0.019

	Arsenic	Cadmium	Chromium	Nickel	Lead		Mercury
Screening Values ¹	43 (children 2-5 yr)	3 (all ages)	11 (all ages)	70 (adult consumers)	3.9 (adult consumers)	0.6 (children 2-5 yrs)	1.0 (all)
Channel catfish (1985) ²⁹							
# Exceedances/ # Sample	$\frac{0}{4}$	$\frac{0}{4}$	$\frac{0}{4}$	No Data	$\frac{0}{4}$	$\frac{0}{4}$	$\frac{0}{4}$
Range	.015-0.20	1.34-2.21	all<0.5		all<0.5		.0010-.024

1. These values for all metals, except mercury, reflect the most restrictive value calculated from FDA guidance using the 90th percentile consumption rate for crustaceans (approximately 15.3 lbs/year for adults, 13.6 lbs/year for children 5 years and up, 8.0 lbs/year for young children 2-5 years). The screening value for mercury is the FDA Action Level, which is protective of all consumers.

2. The white perch sample from 1985 is a composite sample of the filets from 10 fish.

3. The white perch sample from 1990 is a composite sample of the filets from 5 fish.

4. A fish consumption advisory is currently in effect for American eel and channel catfish from Baltimore Harbor.

5. All American eel samples from 1985 are individual fish, which had been beheaded, skinned and gutted prior to analysis.

6. The lead screening level of 0.6 is protective of children ages 2-5 who consume 8 lbs. of eel meat from Baltimore Harbor per year. The screening value for adults (3.9 ppm) is protective of adults consuming 15.2 lbs of eel meat from Baltimore Harbor per year.

7. It should be noted that these eel samples were analyzed with all bones except the head. As bone is the primary repository for lead, lead levels in the eel meat alone would fall below the values presented here.

8. The brown bullhead sample from 1990 is a composite sample of the filets from 5 fish.

9. All four channel catfish samples from 1985 are fillet samples from individual fish.

Table 5. Organic Chemical Concentrations in Outer Baltimore Harbor¹ Softshell Clams Compared to Screening Values.

	Aldrin & Dieldrin (ppm)	Chlordane (ppm)	DDT, DDE, & DDD (ppm)	Endrin (ppm)	Heptachlor & H. Epoxide (ppm)	Mirex (ppm)	PCBs (ppm)	Toxaphene (ppm)
Screening Levels ²	(0.3)	(0.3)	(5.0)	(0.3)	(0.3)	(0.1)	(2.0)	(5.0)
Softshell clam (1993) ³								
# Exceedances/ # Samples	$\frac{0}{3}$	$\frac{0}{3}$	$\frac{0}{3}$	$\frac{0}{3}$	$\frac{0}{3}$	$\frac{0}{3}$	$\frac{0}{3}$	$\frac{0}{3}$
Range	all<.0009 (combined)	<.002-.005	all<.0029 (combined)	all<.0004	<.0004-.0007	all<.0016	<.01-.023	all <.019

¹ All of these clams were collected in the area off the northern Anne Arundel County coast between Rock Pt and Franke Pt. These are the closest soft shell clams to Baltimore Harbor, as no clams or oysters are found inside the Rock Pt - North Pt boundary.

² These values for organic chemicals are the FDA Action Levels.

³ In this data set, there were three 30-clam composite samples.

Table 6. Concentrations of Metal Contaminants in Outer Baltimore Harbor⁴ Softshell Clams Compared to Screening Values.

	Arsenic	Cadmium	Chromium	Nickel	Lead	Mercury
Screening Values ⁵	43 (children 2-5 yrs)	3 (all ages)	11 (all ages)	70 (adult consumers)	3.9 (adult consumers) 0.6 (children 2-5 yrs.)	1.0 (all)
Softshell Clam (1993) ⁶						
# Exceedances/ # Samples	$\frac{0}{4}$	$\frac{0}{4}$	$\frac{0}{4}$	$\frac{0}{4}$	$\frac{0}{4}$ $\frac{0}{4}$	$\frac{0}{4}$
Range (ppm)	all<.05	.04-.20	all<.5	.69-1.35	<.50-.6	.005-.0100

⁴ All of these clams were collected in the area off the northern Anne Arundel County coast between Rock Pt and Frankie Pt. These are the closest soft shell clams to Baltimore Harbor, as no clams or oysters are found inside the Rock Pt - North Pt boundary.

⁵ These values for all metals, except mercury, reflect the most restrictive value calculated from FDA guidance using the 90th percentile consumption rate for crustaceans, i.e., approximately 15.3 lbs/yr soft shell clams from this site for adults, 13.6 lb/yr for children 5 yrs and up, and 8 lbs/year for young children 2-5 yrs. The screening value for mercury is the FDA Action Level, which is protective of all consumers.

⁶ This data set includes four 30-clam composite samples.

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Concentrations and Sources of Contamination in Baltimore Air

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The atmosphere known to be a substantial source of both toxic and nutrient contaminants to some of the Nations most important "great waters", for example, the Great Lakes, the Chesapeake Bay, and the midAtlantic coastal waters. This is especially true for waters such as those of southern Lake Michigan where urban and heavily industrial areas lie in close proximity. As a populous, heavily industrial, and busy midAtlantic deep water port, air pollutants from Baltimore's industries, shipping, and concomitantly-enhanced truck traffic enhance urban pollutant levels and represent a potential source of contaminants to the Chesapeake Bay. To investigate this potential, concentrations of heavy metals, trace elements, extractable organic matter (EOM) and aromatic hydrocarbons were simultaneously sampled in air collected in Baltimore City (Eastern Avenue Fire Station) and at sites on the Chesapeake Bay during an intensive 3-week field study. Additional measurements were made at a background site located on the University of Maryland Campus in Baltimore. The study included application of a unique elemental tracer (iridium) to tag diesel soot particles. Results of these measurements will be used to determine the influence of Baltimore's air pollutants on Bay air quality and to determine their generic sources. Comparison of urban and background measurements may be useful in assessing environmental equity.

Are the Fish Safe to Eat?

Environmental Justice Means Reducing Toxic Pollution

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Introduction

Frequently we are told that pollution problems are a thing of the past. Now that we have strong environmental laws, we no longer need to be concerned about tainted seafood, or other potential health effects of pollution. Many people even believe that it is illegal for companies or farmers to allow toxic chemicals to reach our air and our water.

In fact, toxic chemicals are discharged directly into air and water and sprayed onto agricultural fields every day; legally. And while we don't frequently see fish kills, or blatant human health effects, we still have serious pollution problems. They clearly are not a thing of the past.

The effects of toxic chemicals depend on the amount of the chemical to which a person is exposed. In other words, the dose makes the poison. A large amount of a given chemical, like arsenic, could definitely kill you; a small amount won't. But a small amount of arsenic may cause heart problems, stomach problems, kidney problems, etc. Just because you didn't die, doesn't mean you weren't affected by the arsenic. We need to consider these effects and prevent them too.

Even the Environmental Protection Agency (EPA) acknowledges that pollution problems are still with us. In their draft Sediment Point Source Inventory they describe the current sources of pollution and say that it is currently ongoing and causing sediments to be contaminated:

"Potentially significant sources of sediment contamination include municipal sewage treatment facilities, stormwater discharges and CSO's, urban and agricultural runoff, industrial discharges of process wastewater, leachate from hazardous waste sites, and atmospheric deposition for point and mobile source emissions."

"The study indicates, however, that releases of sediment contaminants are currently ongoing and likely contributing to the formation of contaminated sediments."

You may ask, "What do contaminated sediments have to do with me?" That question brings us back to fish safety. Many of the fish we eat, live and feed on or near the sediments at the bottom of the river. These chemicals that are accumulating in the sediments can be picked up by the fish we eat. Now we are told that we shouldn't worry about this pollution because not enough of it gets into the fish to cause harm to us humans. Let's think about that.

Assumptions in Assessments

The Department of the Environment compares the amount of a given chemical in a fish to a screening level set up by the Food and Drug Administration (FDA) which is determined

through risk assessment to protect human health (Figure 1). This risk assessment is based on a number of assumptions that may not be entirely true. First of all, the safe level really depends on how much fish you eat. Let's use the metal cadmium as an example. Cadmium is commonly found in fish from polluted areas. EPA says that the safe level of cadmium in fish is 10ppm for adults who only eat 6.5 grams of fish per day (Table 1). The FDA level of concern for cadmium says that for the person that eats 15 grams (about a half ounce) of fish per day, the fish level should be below 3.7 ppm.

But EPA acknowledges that the people who eat the most fish are probably recreational or subsistence fishers. And they estimate that these people probably eat more than 6.5 grams per day, and in fact they eat more than FDA's estimate of 15 grams per day. In fact EPA says that some people eat up to 140 grams/day. Almost ten times as much. If you plug that into the risk equation, the acceptable amount in fish should be 0.5ppm, not 10 ppm. Twenty times less. Let's compare that to what we know about Baltimore Harbor.

The concentration of cadmium in crabs in MDE's 1986 report ranged from 0.21 ppm to 0.77 ppm. This is below the FDA screening level, but not below the level that would be expected to protect those who consume the most fish.

Now, this is a very crude way to test whether fish are safe to eat. I can't tell you from experience that people eat 140 grams of fish per day (about a third of a pound per day) from Baltimore Harbor. You may know better than I do. This estimate comes from EPA. The point that I want to leave you with is that this method of comparing concentrations in fish to FDA levels has some shortcomings. There are a lot of assumptions made that may not hold for the most sensitive parts of the population. The first is that they only eat 15 grams per day of fish.

The second assumption is that the chemical of concern, in this case cadmium, comes only from the fish. In fact, there are many other sources of cadmium that a person is exposed to (Figure 2). For example, cigarette smoke is a major source, and even second-hand smoke can be a source of cadmium. There also are many sources of cadmium exposure in workplaces, including electroplating, soldering, battery production, pigments, plastics, alloys, and fumes from smelting or welding. Cadmium also comes from foods other than fish, including grains, meat, and fruit. Urban air contains cadmium, and in fact tends to have about ten times more cadmium than rural air. The risk assessments for the seafood consumption do not consider most of these other sources, but for urban residents, these could be significant.

The assessments also do not consider the situation where the most sensitive individual may be a member of a low income community (Figure 3). In that case, the person has even more going against him or her. For example, poor nutrition can make cadmium more available to a person. In other words, if you have a calcium or iron deficiency for example, your body may tend to absorb cadmium more readily. For cadmium, dietary deficiency of calcium, zinc, copper, iron, and vitamin D can allow cadmium to cause skeletal (bone-related) problems. Good nutrition can help protect us from a number of different toxicants as well. However, if we don't have good nutrition, we lose that element of protection.

Add to that a lack of good health care including preventative care. For example, since cadmium can cause a number of diseases, including kidney damage, chronic bronchitis, emphysema and lung cancer, good health care could catch the problem before it becomes irreversible. But if you don't have good preventative health care, you are at a disadvantage.

Poor living conditions also can affect toxicity. For example, people whose homes have peeling lead paint or asbestos are subject to the effects of multiple chemicals at a time more so than the average population. Cadmium can work with lead to cause neurological problems. It also can increase liver toxicity associated with alcohol.

Chemicals often act in concert with each other. In other words, where you don't have a toxic amount of one chemical, but you have another chemical present, they can work together to cause toxic effects. This is another major weakness of the FDA system.

To say that a given amount of a chemical like cadmium is safe is fine if you are living in a vacuum. But in the real world, we are exposed to hundreds, if not thousands, of chemicals, many of which are toxic (Figure 4). Other than those I have just mentioned, there are a number of pesticides that we are exposed to. There are other metals, like lead and mercury. Not to mention the various organic chemicals including petroleum related chemicals, PCB's, and the like. Some of these are found in fish as well. Maybe not at levels that exceed FDA thresholds. But given the many sources of those chemicals, the stresses on urban and low income communities, and the many interacting chemical effects, which are not considered in setting FDA levels of concern, we should definitely try to minimize the amounts of chemicals that we are exposed to.

Solutions

The solution to this problem is to minimize our risk. There are a number of things we can do. If we can avoid eating fish from contaminated areas like Baltimore Harbor, that would be wise. For those who do eat fish from the Harbor there are a few tips I can share. The first is to practice moderation. If possible, try to find supplementary food sources to reduce the amount of fish you and your family eat. Or try to find an alternative place to fish.

When cooking fish, trim the fat from fish before cooking to help reduce the organic compounds such as pesticides in the fish. This is especially true for fatty fish. Diagram 5 shows how fish should be trimmed to avoid the fat. This involves removing the fatty portions around the dorsal, lateral and belly area. Some states also recommend broiling fish on a broiler pan that allows the fat to drip down into the pan; however, it is unclear how much benefit this conveys.

When eating crabs from polluted areas, I recommend avoiding the "mustard". This is a fatty organ called the hepatopancreas where many toxicants will concentrate. In fact, one researcher in New Jersey found that when crabs are cooked, some toxicants can actually leach out and get into the meat. The same is true if you use whole crabs to make spaghetti sauce. A better way to cook the crab is to remove the mustard first. That's what they do in Tangier Sound, where much commercial crabbing is done. They actually clean the crabs before they

cook them. They use heavy rubber gloves to remove the shell, and wash out the mustard. Then when you add the spices, they really get into the meat!

Exercising prudence in what we eat can help. But we also need to be prudent in protecting the environment. We may not have dead fish floating on the water, but we do have a pollution problem. According to EPA, in Maryland we discharge at least 13 million pounds of toxic chemicals into the air. This is of concern since we also breathe the air. And studies show that what goes up does come down. Over 5 million lbs of those chemicals come down onto the Bay from the atmosphere to contribute to the load of chemicals getting into the Harbor. And in Maryland we discharge 10 million pounds of toxic chemicals directly into the water. This is where the chemicals come from that end up in the fish.

The Chesapeake Bay Foundation promotes pollution prevention so that we have less toxic chemicals in our food and in our environment. Companies that use the environment to dispose of their waste do so at the public's expense. For that reason we believe that companies who use the environment should be required to plan their use of toxic chemicals and minimize releases. Some people say that such planning would close companies down, but actually the opposite is true. Most companies who do this end up saving money and protecting the environment and public health at the same time.

Summary

In summary, the Chesapeake Bay Foundation is not calling for a new fish advisory for Baltimore Harbor, and we are not saying that fish are unsafe to eat. We are, however, pointing out that the existing system for determining seafood safety may not be designed to protect an important segment of the community. Guidelines should be derived to protect people who fish to feed their families.

In addition, we need to take a "Less is better" approach to pollution in the Harbor. While we can't design a system to take all the exposures into account, we can try to minimize the risk. One important way of doing this is to minimize loads of toxic chemicals getting into the water. If we do this, we will protect Chesapeake Bay and move toward environmental justice at the same time.

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Methods to Biologically Monitor Health and Effects of Environmental Contamination in Aquatic Organisms.

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Over the last several decades a variety of methods have been developed to biologically monitor the effects of environmental stressors in the aquatic environment. These stressors include anthropogenic contaminants such as polycyclic aromatic hydrocarbons, pesticides and metals, as well as changes in water quality. In conjunction with chemical analysis of water samples, biomonitoring, allows researchers, environmental managers and regulatory agencies to evaluate effects of pollutants or altered water quality on individual organisms. Data from individuals may then be extrapolated to populations, a process known as risk assessment. However, the relationship between measurable biomonitoring endpoints *in vitro* (i.e. induction of specific proteins, alteration of metabolizing enzyme activities, etc.) and functional effects of specific (chemical) stressors on aquatic organisms *in vivo* (and *in situ*) remains unclear. This is because many of the endpoints are non-specific with regard to the stressor. We are developing an integrated holistic approach to biomonitoring stressor effects using a combination of responses *in vitro* (alterations in phase I and phase II metabolizing enzymes using liver tissue slices and microsomes as enzyme source, and changes in immune function) as well as *in vivo* (behavior, blood analysis and histopathology). An overview of the different methodologies will be discussed with consideration given to risk communication.

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HOUSEHOLD HAZARDS

**Investigations in Environmental Equity:
Young Adults and Lead Exposure in a Community Setting**

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The study of environmental equity explores hypotheses centered on the premise that individuals of lower socioeconomic status, as measured by income, educational levels, or other characteristics, and members of minority groups experience an inordinate and unfair burden of environmental exposures. We are using lead exposures as a paradigm for all environmental exposures in this study of young adults in two cities, Boston, Massachusetts, and Baltimore, Maryland. Exposures to lead are being measured using four different methods, questionnaires, environmental sampling, and two different biological markers for lead exposure: blood lead concentration, and bone lead concentration as measured by *in vivo* K x-ray Fluorescence. In this work we report preliminary results of the investigation in Boston, Massachusetts. Two study populations are investigated. The first includes students attending an alternative high school in the city. Their ages range from 16 to 22 years. The second group is drawn from a woman's college in the Boston area with participants in the 18 to 22 year age range. Results are presented in a descriptive manner for questionnaire data, environmental samples, and for the biological markers. Using the questionnaire responses, we then placed participants in categories for socioeconomic status, minority status, and other indicators. Environmental concentration distributions as well as biological marker distributions within and between classes are then compared to assess the validity of the environmental equity hypotheses for this pollutant. A brief discussion of the second phase of this investigation, to take place in Baltimore, Maryland, follows. Suggestions for extension of this work are made.

**Phase I Field Investigations for the National Human Exposure
Assessment Survey (NHEXAS): The Relationship Between Short-Term
Measurements and Long-Term Exposures**

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The National Human Exposure Assessment Survey (NHEXAS) sponsored by the Environmental Protection Agency is a large-scale investigation of multimedia, multi-pollutant, exposures experienced by human populations. Phase I field Investigation is one of three such investigations now underway. The goal of this study is to assess the relationship of short-term environmental and biomarker measurements with long-term exposure estimates. In this paper, we discuss aspects of study design focusing on statistical issues including sample size, predictive power, and response biases in a study designed to assess this relationship. The full statistical design for the Harvard/Johns Hopkins study will be presented. This presentation will include discussion of selected sample size for number of repeated cycles, and estimates of parameter variability associated with each. In addition, preliminary results for the first two cycles will be presented with an analysis of attrition rates, data completeness, and quality assurance results. We will discuss projections for the remainder of the study and potential alternative designs.

Community Education on Lead Paint Hazards: Reaching Those Who Can Prevent Lead Poisoning

Ruth Ann Norton, Coalition for a Lead Safe Environment, and Jane Schukoske,
University of Baltimore School of Law

A key issue for the environmental justice community is education of families at risk and others who are in a position to act to prevent lead poisoning. The purpose is to prompt changes in behavior so that children in Baltimore are better protected from lead hazards. Lead poisoning is widely recognized as an environmental justice issue since it widely affects low income children who are often in families living in deteriorated homes.

The paper will explore essential aspects of a community education program that can be staged in light of our current level of knowledge. The subjects to be covered in community education for parents and other family members of children at risk of poisoning include identifying lead hazards in housing, cleaning practices, nutrition, blood lead screening for children and pregnant women, health and housing resources available, resources of homeowners to abate lead hazards, and the rights of tenants to lead safe housing. Other audiences to be targeted include those in occupations who work with children under age six and/or with pregnant women, and personnel with the city, with health care providers, and with nonprofit organizations who work with low income families residing in deteriorated housing. Education for other target audiences, such as the realty industry and the judiciary, will also be examined.

Innovative ideas for driving the key points home will be a focus of the paper, thereby making it useful to many groups interested in promoting this education, and lively for presentation. For example, in a training session held in Baltimore in 1994, roleplaying was used to effectively depict the concerns and responsibilities of landlords and tenants when lead hazards exist in a rental unit. In addition, the paper will propose mechanisms for reinforcing new prevention efforts, in recognition of the fact that one-shot community education efforts are generally ineffective.

Common problems in community education efforts - such as low participation rates in voluntary programs, mixed educational levels in a trainee group, and the gap between creating awareness and changing behavior - will be explored.

Proposed community education programs in Baltimore relate to efforts on the federal level to promote more lead poisoning prevention in private housing. The paper will flag federal, state and non-profit efforts which may be tapped for materials and other resources.

S-DC/SEE
Sojourner-Douglass College Students for Environmental Equity

*The Issue of Lead Poisoning in the Community:
Facing a Treatable Problem*

Recent surveys conducted by Sojourner-Douglass College interns, in conjunction with Kennedy Krieger Institute, have indicated that most persons are not aware of lead poisoning and its effects. There are many resources available to the community that could increase the awareness of lead poisoning and its potential effects. It is the duty of the entire community to ensure that no child will suffer from lead poisoning because not enough adults are willing to help educate others about lead poisoning. Parents, community educators, and health maintenance persons need to evaluate, assess, and disseminate informational resources that are available. Without a strong interlinking network of lead poison prevention programs, as well as persons/facilities that are capable of giving treatment, lead will always affect the community.

Lead in residential and public housing continues to be the major source of lead poisoning in Baltimore City. Lead poisoning is a tremendous problem not only in urban areas but also suburban communities. A large majority of the population who live in urban areas are developing asymptomatic effects.

Some examples of multiple sources of lead in which children are exposed are: stationary sources (lead smelters, factories, and buildings that burn recycled oil, dust, soil (from all sources), plumbing, food contamination and cooking water. Even small amounts of lead can cause learning, health and behavioral problems during the most important stages of a child's development.

There are many families living in sub-standard conditions laced with lead paint or other lead-based sources. Children from these families tend to have a higher risk factor of being lead poisoned. Persons are at a high risk if they live in older homes or apartment buildings (built before 1978), or frequently visit a person who lives in older homes (built before 1978), or a child's playmate has lead poisoning, or if an adult member of the household uses lead in a job, hobby, recreational activity, household tableware or ceramics.

The main problem that arises from the effects of lead poisoning is its impact on the total realm of a child. Lead is known to affect a child's learning, behavioral and psychological demeanor. It is important to educate parents, teachers and others who are responsible for overseeing the well-being of a child on the effects of lead poisoning. It is the responsibility of the school

system and other learning facilities to develop special learning programs to boost the diminished I.Q. level and academic performance of a lead poisoned child.

People living in older residences (built before 1978) need to be alerted about lead poisoning sources that could be in their homes. Property owners need to receive informational resources about the effects of lead poisoning and how it can be abated.

Some of the informational resources available are lead informational hotlines, lead poisoning prevention programs, and blood drawing centers that will screen the blood for lead. All of these resources will disseminate information about lead poisoning, its effects, the ways it can be treated, and the names of facilities that will provide the necessary treatment.

From the surveys and research completed by Sojourner-Douglass College interns, the following recommendations have been suggested:

- A) More door-to-door interactions from lead poisoning prevention organizations
- B) The increased dissemination of literature about lead poisoning prevention and its effects on the community.
- C) Establishing special needs programs for 'lead effected children' in the schools and other learning facilities
- D) More availability of lead safe housing
- E) More advertised blood drawing screening locations
- F) Because community clinics and emergency rooms are the primary health care sites used by low socioeconomic families in urban areas, it is importance to screen all children for lead as a regular check-up procedure and reporting the lead level to parents
- G) Emphasizing to medical personnel the importance of screening children regularly for lead and also doing follow-ups.
- H) Establishing lead prevention programs through the school system to help educate parents, students, and the medical personnel in the community about the awareness of lead poisoning.

**THE "LEAD ARENA": JUMPING INTO THE "BIG LEAD BUSINESS" OR TRYING TO
HELP SUSTAIN A STRONG FUTURE---OUR CHILDREN**

Throughout my research on lead poisoning, a very important question comes to mind. Sometimes I have to wonder whether lead prevention agencies are in the game of just getting large amounts of money to fund lead programs because it is the "environmentally correct" thing to do or do they mean well in the modes of education and treatment they demonstrate to the community? The politics of the game is that if all children are prevented and treated for lead poisoning then all of the lead poisoning prevention programs will be non-existent.

During my investigation about lead I have discovered many hotlines, educational literature, treatment programs, mops, buckets, high phosphate cleaning and big bucks. Because lead is a hot topic in the environmental world, I decided to do research under Kennedy Krieger Community Lead Poisoning Prevention and Treatment Center Program in mid-east Baltimore City. From my knowledge, I only knew that children got lead poisoning from chewing on lead pencils. My interest was peaked to the point where finding out all I can about lead and its hazards has been and will continue to be a goal as long as lead prevention programs are not doing all they can to help ensure a healthy future for all children--lead effected or not.

If I had never gathered information about lead I probably would not have asked for my child to be lead test, or asked my child's physician for the lead level, or ask my child's daycare provider for documented papers on the lead inspection of the home, or ask for my home to be lead inspected.

Independent studies have shown that sponge cleaning window sills and wet mopping with high phosphate cleaners (such as Cascade) only worsen the situation of getting rid of the lead dust. Agencies are using the "wet mopping/high phosphate" cleaning demonstration as the main source of reducing the chance that children will become lead poisoned. When window sills are wiped cleaned with sponges and high phosphate, the smallest piece of paint chips peel and hundreds of lead dust particles become airborne and contaminate the children from inhaling it. This method creates a worst problem rather than a solution.

Medical institutions along with lead prevention programs and the community should start at the begin of a child's development. Children should be lead tested during their early months and every six months until they are six years old. Before entering public and private learning institutions, lead testing should begin in nursery schools, pre-schools and then elementary schools. Lead testing and reporting should be a mandatory requirement as well as immunization shots and dental records.

Because the majority of children are not lead tested, they are considered learning disabled and the school system gives them the ARD test to see what is the learning disability level of a child. Lead effected children are put into special education classes. The children are perceived as normal hyperactive, low attention spanned children. In all reality, the school system and other learning facilities are not equipped with the proper teachers that understand the total realm of a lead children. The school system never suspects that a child is lead poisoned. If lead can not be traced through the blood, then the bones are to be tested to indicate the level of lead poisoning in a person.

Without mandatory lead testing, children will never achieve their full potential of academic success. The lead effected child will continue to live in a cycle of poverty which will lead to a devastating future for children especially African-American children because they are the majority effected by lead.

A diligently and strong interlinked lead poisoning prevention programs should be developed for the sake of healthy living. The environment in which we live is very important and should be maintained for the good of future generation to come.

**Childhood Lead Poisoning in Baltimore's Black¹ Community:
A Local Example of a National Environmental Justice Problem**
by Max Weintraub M.S.
National Safety Council's National Lead Information Center

Abstract

1.7 million children have elevated blood lead levels. Childhood lead poisoning severe enough to require medical evaluation is seven times more prevalent among Black children than White children. This disparity is due to the distinct and combined impacts of racism and classism. Baltimore's long history with childhood lead poisoning supports this conclusion. The Environmental Justice movement developed in part to address such environmental health disparities by race and/or class. Recent efforts to eliminate childhood lead poisoning at the national level and in Baltimore have grown. However, their success in preventing childhood lead poisoning and reducing the disparate impact of childhood lead poisoning on Black children may depend upon addressing concerns expressed by the Environmental Justice movement.

I. Introduction

Urban environmental justice issues have a long and troubling history in the United States.² Shortly after the EPA was formed in 1970, President Nixon was informed that,

"For many inner city residents, the overwhelming concern is poverty and its accompanying ills - inadequate housing, high crime rates, poor health, unsanitary conditions, inadequate education and recreation, and drug addiction - all of which are exacerbated by racial discrimination. These factors may not be environmental when looked at individually. But their net effect is to lower the quality of life."³

Twenty-five years later, lead poisoning remains an environmental justice problem resulting from poor housing that contributes to poor educational achievement, decreased employment, increased criminal behavior, and poor health. And in the case of childhood lead poisoning, the overwhelming concern is racial discrimination exacerbated by poverty. At every income level, Black children are more likely to be lead poisoned than are White children. However, the impact is more severe among the poor. As a consequence of these disparities by race and class, childhood lead poisoning is identified as an environmental justice problem; one which in certain respects is growing.

Baltimore's population typifies these findings. Preliminary findings of surveillance data collected by the Centers for Disease Control and Prevention indicate that, in many respects, childhood lead poisoning is a significantly more severe problem in Baltimore than in many other cities. This paper will place the long history of lead poisoning among Black children in the US and Baltimore in the context of the environmental justice movement, give an overview of federal legislation designed to prevent childhood lead poisoning, outline current federal lead poisoning prevention activities, describe the efforts of other municipalities to use federal support to prevent lead poisoning, and suggest means to insure that lead poisoning does not continue to be an environmental justice disaster in Baltimore.

II. Childhood Lead Poisoning: Impact and Prevention

Childhood lead poisoning causes decreased growth, hearing, attention span, IQ, and visual-motor integration (all of which, to varying degrees, are permanent) while increasing antisocial behavior and hyperactivity.⁴ The net result is that lead poisoned children are more likely to require special education, suffer abuse, and, as adults, are more likely to earn lower wages, become criminals⁵, experience reproductive difficulties and other health problems, and have shortened lifespans. The societal costs of these impacts may reach into the tens of billions of dollars.⁶

A 78% decrease in young children's average blood lead level occurred between 1976 and 1991 due to the removal of lead additives in gasoline and lead solder in canned goods. However, the decrease has slowed down, if not stopped.⁷ This result is not unexpected. Lead-based paint was banned for residential use in the U.S. in 1978. U.S. manufacturers produced more than 5 million tons of white lead for paint during the last century. The primary use of the paint has been to coat 64 million homes. 12 million of these units currently house families with children under seven years old. Eliminating lead poisoning of these children requires preventing exposure to poorly maintained lead-based paint and the lead-contaminated dust produced under such conditions.⁸

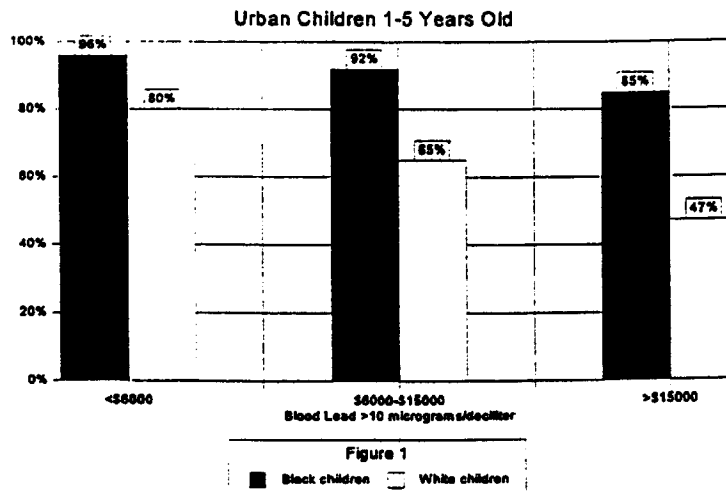
III. Childhood Lead Poisoning: National Trends and Totals by Race and Class⁹

National childhood lead poisoning trends are complex. Between 1976 and 1991, the number of children with elevated blood lead levels dropped from 6 million to 1.7 million. The proportion of children with elevated blood levels who are Black is increasing. The difference in the proportion of Black and White children in wealthy families with elevated blood lead is decreasing while the gap between Black and White children in poor families is increasing. Most of the children who experience severe lead poisoning and death are Black.

The difficulty inherent in deciphering these trends is compounded by the debate about what actually constitutes childhood lead poisoning. Currently, CDC recognizes 10 micrograms of lead per deciliter of blood as the level of concern. For the purpose of conciseness, I will equate the level of concern (10 µg/dl) with lead poisoning while recognizing that as a child's blood lead level increases beyond this level, so does the harm produced.

The CDC standard can be assessed from two vantage points. The standard is low relative to certain individual harm. Scientific studies indicate that child populations experience IQ loss when their blood lead levels exceed 10 µg/dl and that other detrimental impacts follow at slightly higher levels, but the impact on the individual is less predictable. However, the standard is high relative to potential individual harm. The body has no known use for lead. Since children can die when their lead levels approach 100 µg/dl, lead has the notoriety in the United States of being the toxin where never have so many people been burdened with levels so near the toxic dose.¹⁰ The federal standard has steadily decreased during the last few decades to reflect the increased understanding that there may not be a threshold below which lead has no adverse effect on children.

NHANES II (1976-1980)

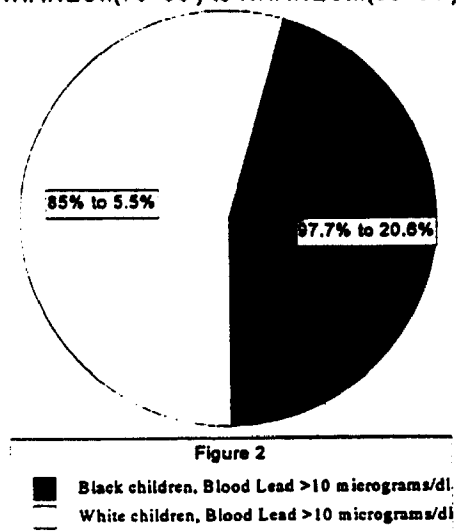


Ever since medical surveillance records that include race have been kept in the United States, childhood lead poisoning has been found to disproportionately impact Black children. Indeed, the strength of race as a determinant of childhood lead poisoning is evident in the disparity within each class category first noted nationally in the second National Health and Nutrition Examination Survey (NHANES II) conducted from 1976 - 1980 (Fig. 1).¹¹ This finding was similar to data collected by health departments from large cities throughout the Northeast and Midwest since the 1930's. NHANES II also showed similar disparities, though less severe rates of lead poisoning, among children living in non-urban areas. NHANES III (phase I) was conducted from 1988 to 1991 and offers valuable insights into childhood lead poisoning trends when contrasted with the findings of NHANES II.

Since NHANES II, childhood blood lead levels have dramatically decreased. However, as Fig. 2 indicates, that decrease in the percentage of children with elevated blood lead levels has not been evenly distributed. White children benefitted almost 18.5% more from the decrease in blood lead levels during the last two decades than their Black

Decline in Elevated Blood Lead Level

NHANESII(76'-80') to NHANESIII(88'-91')



counterparts.¹² The racial disparity exhibited in childhood lead poisoning is growing as reflected by the finding that during the NHANES II study the majority of children with elevated blood lead levels were White while during the NHANES III study, the majority of children who continued to experience elevated blood lead levels were children of color.

Black children not only make up an increasing proportion of children with elevated blood lead levels, but as the level of lead poisoning increases, so does the proportion of Black children. The 1990 census conducted during the NHANES III study period counted 14 million White children and 2.9 million Black children from one to five years old. According to NHANES III, approximately 1.7 million children (including 770,000 White children and 590,000 Black children) have elevated blood lead levels (Fig. 3).¹³ Of those, 80,000 White children and 110,000 Black children have blood lead levels of sufficient severity (above 20 µg/dl) to require medical evaluation.

Relative to population size, these findings indicate that Black children are four times more likely to have elevated blood lead levels than White children. And the disparity continues to grow at increasingly high blood levels. Black children are seven times more likely than White children to need medical evaluation for lead poisoning.¹⁴ The explicit impact of race in childhood lead poisoning is shockingly clear given that there are more than four times as many White children as Black children and that twice as many White children live in low-income families as Black children.¹⁵

Children 1 to 5 Years Old, 1990

Total vs Elevated Blood Lead

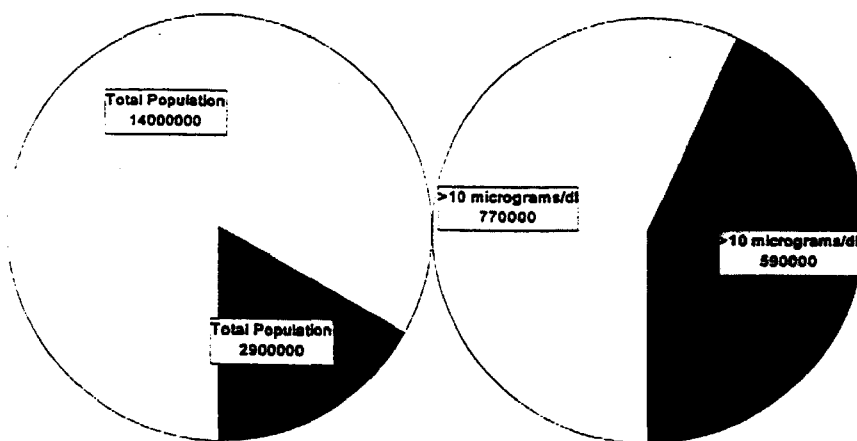
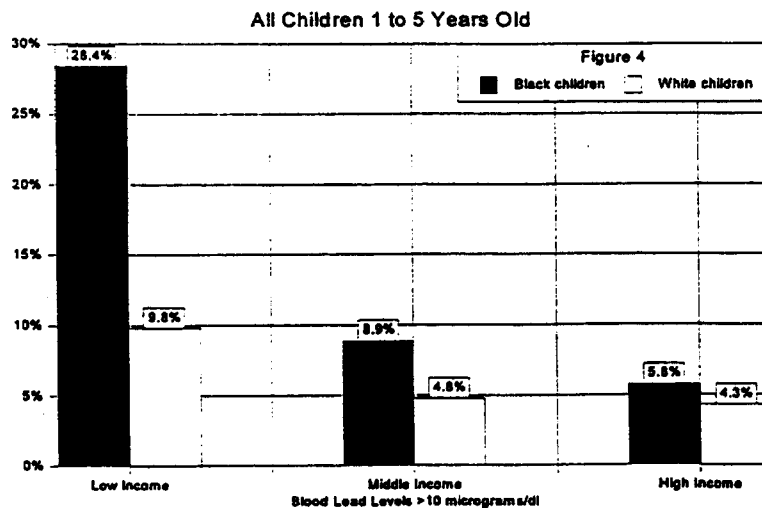


Figure 3

■ Black children □ White children

NHANES III (1988-1991)



Class does, however, modify the impact of race on childhood lead poisoning as comparing NHANES II and NHANES III illustrates. The gap in lead poisoning between Black children and White children in poor families has grown while the gap between Black children and White children in wealthy families is decreasing (compare Fig. 1 and Fig. 4).

CDC recommends that children be screened for lead poisoning at one year of age. However, lead may impact children (and, in particular, Black children) long before they are screened. During the interval from NHANES II to NHANES III, three times as many Black adults (~ 95) died from lead poisoning as White adults.¹⁶ However, according to NHANES III the percentage of Black adults and White adults with blood lead levels >25 µg/dl is equal (.04%). This finding indicates that Black adults are more likely to experience very severe lead poisoning than White adults and thus the reproductive impacts are likely to be greater.

Men with blood lead levels >40 µg/dl experience abnormal sperm development and activity. The impact of such lead exposure on ova development is unclear. Pregnancy does, however, trigger the release of substantial quantities of lead accumulated in a woman's bones. As that lead is circulated in the maternal blood, some crosses the placental barrier to the fetus. The impact of fetal lead exposure is poorly understood, but likely harmful.

After birth, Black children face additional risks of lead poisoning even before recommended screening at one year of age. About 85% of the blood lead in bottle-fed infants may derive from drinking baby formula made with lead-contaminated water.¹⁷ Black women are more likely to bottle feed infants than White women. Because Black children are four times as likely to live in poverty as White children, the potential for malnourishment and pica behavior is greater.

Lead poisoning of Black children in Baltimore reflects these national trends. In 1994, five out of every six children in Maryland with elevated blood lead levels lived in Baltimore. Of the 1600 with levels sufficiently high to require medical evaluation, 94% lived in Baltimore and the vast majority are low-income and Black. Indeed, generations of Baltimore families are lead poisoned. The vast majority of lead poisoning cases in Baltimore occur in housing stock built before 1950. Examining Baltimore's lead poisoning prevention efforts helps explain how this tragic situation arose.

IV. Brief History of Childhood Lead Poisoning in Baltimore

Childhood lead poisoning has a long history as an environmental injustice in Baltimore. During the Depression, low-income Black families burned batteries for warmth. Several children died and a ban was passed on the practice in 1933. In 1952, the city health department reported that during the previous twenty years Black children comprised twice the number of lead poisoning cases and deaths as White children.¹⁸ During that interval (when less than half of Baltimore's population was Black), 60 Black children and 31 White children died from lead poisoning. In response, Baltimore implemented one of the first bans in the U.S. on the residential use of lead-based paint.¹⁹ During the next five years, Baltimore experienced 133 cases of childhood lead poisoning, 10 childhood lead poisoning deaths, and the passage of an even stricter law in Baltimore in 1958. However, enforcement remained lax.²⁰

A few other Northeastern cities had childhood lead poisoning problems equally severe, but Baltimore's had been the best documented and, thus, the most disturbing. By the early 1950's, Baltimore researchers recognized the population at greatest risk, the source of the poison, and the seasonal variation of the poisoning.²¹ Since then, the level of lead in a child's blood considered harmful has been lowered from 60 micrograms/deciliter to 10 micrograms/deciliter as the severe danger lead poses became fully understood.²²

V. Childhood Lead Poisoning as an Urban Environmental Justice Issue

The environmental justice movement achieved national prominence during the 1980's as civil rights and environmental activists came together to combat a series of environmental problems that disproportionately impacted communities of color and low-income communities. The movement's goals are reflected in the Principles of Environmental Justice (see Appendix 1) adopted at the First National People of Color Environmental Leadership Summit in 1991. These goals include achieving environmental equity and eliminating environmental racism. In regards to lead poisoning, neither goal has been achieved.

Environmental equity may refer to geographic, social, or procedural equity.²³ Geographic equity has not been achieved as urban Black populations are more likely to be lead-poisoned than rural Black populations. Social equity has not been achieved as Black families do not receive protection equal to White families against lead poisoning. Finally, procedural equity has not been achieved as those most at risk of lead poisoning - low-income, urban, Black communities - do not have equal access to environmental decision-making processes that guide lead poisoning prevention policy development. These measures of equity do not operate in isolation.

Geographic equity is particularly unlikely to be achieved given the long-term social equity problem of hypersegregation (defined as the extreme, multidimensional, cumulative residential segregation experienced by Black people) prevalent in Baltimore. Half of all housing units in Baltimore are renter occupied and half of those (almost 70,000) constitute high priority lead-based paint residences as a consequence of being built before 1950.²⁴ The hypersegregation of Baltimore's Black community places Black tenants in such units and, not surprisingly, produces negative health impacts which include childhood lead poisoning.

Hypersegregation of Black people at every income level results in increased infant mortality for the Black community and decreased infant mortality for the White community which suggests that White communities benefit from hypersegregation by gaining a healthier living environment.²⁵ The hypersegregation of the Black community identified in Baltimore since at least 1980 is becoming increasingly common throughout the United States²⁶ and has health impacts that reflect the fact that even middle-income Black people are "forced to live in socioenvironmental conditions that - although superior to those of low-income blacks - are not consistent with their economic status."²⁷

Procedural equity has not been achieved as those most impacted by lead poisoning, urban low-income Black communities, do not have equal access to environmental decision-making processes. This was most recently shown in the process of developing and passing Maryland lead legislation. In May of 1994, the state legislature passed the Maryland Lead Poisoning Prevention Act (HB 760). The goal of HB 760 was to make the transition from a reactive approach that addressed lead exposure after a child was poisoned to pro-active approach that eliminated potential residential lead hazards. While the process of developing, passing, and implementing the law has brought together many stakeholders, Black parents and tenants are not involved. This fundamental flaw in the process ensured that a significant voice of experience was not consulted and thus the potential for successfully dealing with this very difficult problem was not maximized. Indeed, one recent study concluded that the Lead Paint Poisoning Commission formed in 1993 to develop legislative solution to childhood lead poisoning

"...risked the signing of HB 760 by excluding tenants, grass-roots environmentalists, lead abatement workers, and the parents of lead poisoned children from its proceedings. As a result, the Commission received conflicting messages from anti-lead proponents during the final stages of negotiating language for the language."²⁸

The result of the conflicting messages due to lack of inclusion among anti-lead proponents, and the strong opposition of property owners, was the inclusion of controversial language that for the first time in the U.S. created a controversial limited liability system for compensating poisoned children. The law requires parents to notify landlords if children or pregnant women are present, if a lead hazard exists, and if a child has been poisoned.²⁹ The regulations are supposed to ensure that landlords follow through with claims that they have taken necessary measures to eliminate lead hazards and that the new responsibilities upon tenants are not onerous.³⁰ Since then, anti-lead proponents have tried to ensure that sufficiently strong regulations are released to protect tenants while fighting off bills introduced on behalf of landlords to repeal HB 760.

These procedural problems may have been avoided 1) if the Commission had listened to concerns expressed in 1993 about the absence of Black parents and tenants from Baltimore on the Commission³¹ and 2) if the anti-lead forces had successfully included such individuals within their ranks.³² Unfortunately, neither created situations that enabled Black tenants and parents to speak for themselves. Instead, Black tenants and parents were advocated for by those from outside the community. The product of these inequities - widespread childhood lead poisoning of the Black community in Baltimore - may be defined as environmental racism. The Environmental Justice movement identifies the problems associated with this approach.

The Principles of Environmental Justice outline criteria to assess environmental justice concerns and determine if environmental justice has been achieved. Childhood lead poisoning prevention efforts at both the federal level and in Baltimore fail several of these tests (Table 1).³³

Table 1 Evaluation of Childhood Lead Poisoning by Environmental Justice Tests

Principle	Statement of Test	Outcome
#2	Environmental justice demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias.	Fail. Past public policy efforts have discriminated against urban, African-American and low-income populations.
#4	Environmental justice calls for universal protection from nuclear testing, extraction, production and disposal of toxic/hazardous wastes and poisons and nuclear testing that threaten the fundamental right to clean air, land, water, and food.	Fail. Lead is a ubiquitous toxin that threatens the fundamental right to clean air, land, and water. ³⁴
#5	Environmental justice affirms the fundamental right to political, economic, cultural, and environmental self-determination of all peoples.	Fail. The population most disproportionately impacted by lead poisoning did not choose to be exposed ³⁵
#7	Environmental justice demands the right to participate as equal partners at every level of decision making including needs assessment, planning, implementation, enforcement, and evaluation.	Fail. Those most impacted by lead poisoning have not been equal partners in developing and overseeing solutions.

Failure to fulfill the Principles not only reflects weaknesses in past efforts, but also identifies what remedies are needed to achieve environmental justice in the future. Neither the process nor outcome of lead poisoning prevention activities should discriminate against low-income Black families. Such families, and particularly those with lead-poisoned children, must be included in developing solutions. This does not simply mean inviting such folks to participate, but requires that such folks participate. Means to achieving such participation must be negotiated with impacted families. And that negotiation (as well as all activities that follow) must treat such families as equal partners with veto power during discussions. Such an approach challenges the institutional norms of community interaction followed by other lead poisoning prevention stakeholders, but also ensures more active community involvement in health and housing maintenance while offering new solutions to lead poisoning. While these remedies are applicable in Baltimore, they serve as a template for activities in other cities with similar problems.

VI. Federal Action on Lead-Based Paint

a. Past Federal Actions

The federal government took action in 1971 by passing the Lead Based Paint Poisoning Prevention Act.³⁶ The law required the U.S. Department of Housing and Urban Development (HUD) to investigate the nature and extent of lead-based paint poisoning in the United States as well as determine the "most practicable" means of residential abatement. HUD's failure in meeting the requirements of the law forced Congress in 1987 to threaten HUD with a complete halt to all policy development funding unless a workable plan was submitted to Congress within nine months that outlined the legislative actions needed for cost-effective inspection and abatement of lead-based paint.³⁷

HUD's response resulted in additional congressional legislation in 1988 that represented a fundamental shift from treating the lead-poisoned child to eliminating residential lead-based paint hazards before the child is poisoned. However, the response considered all lead-based paint hazards equal. The passage of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (which was Title X of an omnibus housing bill) created a means to prioritize and prevent exposure to lead hazards.³⁸

b. Current Federal Actions - Title X

Most current federal efforts to eliminate lead poisoning are a direct result of the passage of Title X. The strategies implemented by Title X are as follows:

- Develop a framework to reduce lead hazards by focusing resources to maximize health benefits and promote actions appropriate to various hazard and housing situations.
- Impose requirements to make the federal government a responsible landlord, encourage the development of a quality abatement industry, and clarify standards of care in private rental housing.
- Increase resources for abatement, accredit training programs, provide standards for contractor and worker training as well as worker protection, certify laboratories, and establish timetables for action.
- Raise public awareness and use market forces to make private housing lead-safe.

In order to achieve these ends, various federal agencies were assigned specific duties and an interagency task force on lead created in 1989 was used to promote program coordination. The actions required are understandably very broad and will take several years to implement (See appendix). While most of the requirements concentrate on giving guidance to local partners like Baltimore, some funding to enact this guidance is also provided.

Lead Hazard Control Grants totaling \$279 million have been awarded to 56 state and local grantees by HUD to support (through education, loans and abatement) the reduction of lead-based paint hazards in private housing. State Program funding totaling \$23.3 million, have been issued to 46 states, the District of Columbia, and 17 Native American tribal governments by the U.S. Environmental Protection Agency (EPA) to support the development of training and certification programs. Worker and Supervisor Training grants totaling \$4.85 million have been issued by EPA and National Institute for Occupational Safety and Health (NIOSH) to ensure that proper training takes place and that those unable to afford training costs can still participate. Finally, numerous studies in local research institutions are being funded by HUD, EPA, Centers for Disease Control and Prevention (CDC), and National Institute of Standards and Technology (NIST) to determine appropriate actions under Title X.

c. Current Federal Actions - Other Sources of Federal Financial Support for Local Actions³⁹

Federal financial support for lead poisoning prevention may be either direct or indirect. Activities supported by these funding sources range from education and outreach to worker training and bonding to abatement activity. While Baltimore has received funding from some of the larger sources, smaller grants remain largely untapped.

Direct federal government support consists of general funds that may be used for a variety of activities including lead poisoning prevention. All require a state or local partner to receive and coordinate proper distribution of the federal funds. Some require partial funding from the local partner. Examples of direct federal financial support include, but are not limited to,

- EPA: Superfund, Resource Conservation and Recovery Act, Environmental Education, Brownfield, Supplemental Environmental Protection and Environmental Justice funds
- HUD: 203(k), 312 Rehabilitation Program, Rental Rehabilitation Program, Community Development Block Grant (CDBG), HOME, and Energy Efficient Mortgage funds as well as CIAP modernization funds for public housing authorities
- HHS: Maternal and Child Health Block Grant (MCHBG), the State Preventative Health and Health Services Block Grant, Family Support and Community Services Block Grant, Medicaid's EPSDT program and Grants to States for Childhood Lead Poisoning Prevention (the sole non-Title X grant designated for lead poisoning)
- Empowerment/Enterprise Zone interagency funds
- Job Training Partnership Act (JTPA) funds
- Low Income Housing Tax Credit
- Agency research funding for health, housing, and/or environmental studies.

Indirect federal financial support consists of legislation that encourages private lenders to make private loans in their service area for a range of activities that may include lead poisoning prevention. Such loans are encouraged through the Home Mortgage Disclosure Act operating in conjunction with the Community Reinvestment Act. Loans made in response to these Acts have been used to support lead abatement activities.

d. Case Studies

The hundreds of millions of dollars currently being directed at lead poisoning prevention has been distributed through a number of agencies to support a number of innovative programs. Summarized below (Table 2) are the main lead poisoning prevention funding sources for six localities and a brief description of innovative activities they have undertaken. The goal of this summary is to make Baltimore citizens aware of the possible means and methods available to address lead poisoning. These approximated funding figures indicate that during the last three years Baltimore has received more federal funding for lead poisoning prevention activities than any other city in the country.

These six localities are using the funds to support lead poisoning prevention in a number of innovative ways. Alameda Co., Boston, and Cleveland are helping to create small community-based abatement businesses. Alameda Co. is training Housing Department staff to incorporate lead-safe practices into their activities. Chicago is using community outreach agencies to conduct outreach and train abatement clearance swab teams. New York City is targeting abatement efforts to women with infants in neighborhoods identified as having a high proportion of deteriorated housing. Washington D.C. is using CDC funding to support residential lead inspections. All of these localities are preparing to implement new, more efficient, lead poisoning prevention efforts as lessons are learned from current activities.

The impact of these grants in Baltimore and other cities are being guided and assisted by several national non-profit organizations. Activities conducted under the largest of the funding sources, the HUD grants, are currently being evaluated by the National Center for Lead-Safe Housing in Columbia, MD at (410) 992-0712. Information on legislative efforts to address lead poisoning is available from the Alliance To End Childhood Lead Poisoning in Washington, D.C. at (202) 543-1147. United Parents Against Lead maintains contact with local advocates nationwide and can be reached at (312) 324-7824 or (518) 392-5304. Additional information and free materials on lead poisoning prevention is available from the National Lead Information Center at (800) LEAD-FYI or (800) 424-LEAD.

**Table 2. Federal Funding for Lead Poisoning Prevention Activities in Different Localities
1993-1995**

Federal \$\$ for local activities	Alameda County CA	Baltimore MD	Boston MA	Chicago IL	Cleveland OH	New York NY	District of Columbia
HUD	\$10mil (2 years)	\$11.7 mil (2 years)	\$5.5 mil	\$6 mil	\$8.5 mil (2 years)	\$6 mil	
CDC- Lead	\$450,000	\$510,000	\$300000	\$550000	\$420000	\$900000	\$480000
MCHBG		\$540,000	\$300000	\$350000	\$110000	\$900000	\$400000
CDBG				\$1.5 mil	\$500000		
JTPA					\$600000		
EPA-Env. Justice	\$170,000 (2 grants)	\$180,000 (2 grants)					
EPA-Env. Inspection	\$215,000						
EPA-State Program							\$410000

(these figures represent approximate annual funding received during at least one year
from 1993-1995 unless otherwise noted)

HUD funds are being used for lead abatement related activities.

CDC funds, which are distributed on a five year basis, focus on lead education, screening, and inspection activities.

MCHBG funds are used for lead education and screening.

CDBG funds are used for lead hazard control work in low-income homes.

JTPA funds are used for lead related career development.

EPA Env. Justice funds are used for education and community-based abatement efforts

EPA Env. Inspection funds are used for community-based abatement efforts

EPA State Program Start-Up funds are used to create state or local lead abatement-related certification/accreditation/enforcement programs.

Note that MCHBG, CDBG, and EPA-State Program funds, as well as some JTPA and CDC funds, go directly to the state and then trickle down to the local government.

VII. Conclusion

Past lead poisoning prevention efforts have failed to provide equal protection to all children. Baltimore, despite all the efforts of the past forty years, continues to have families poisoned by lead generation by generation. Part of the reason for this failure may be attributed to racism and classism limiting the involvement of families most impacted by lead poisoning in the development of solutions.

During the past three years, \$300 million dollars has been made available from federal agencies for lead poisoning prevention efforts. Baltimore alone has received \$13 million dollars. The efficient expenditure of this unprecedented funding will directly impact whether another generation of Baltimore's Black children are poisoned by lead. Such efficiency will depend to a large degree on community involvement in the development of solutions. The Principles of Environmental Justice provide guidance on the form of that community involvement; guidance that as of yet remains unacknowledged.

The federal government has made a significant commitment to the prevention of lead poisoning. Various municipalities are trying to figure out how to respond. Baltimore's success or failure in this endeavor will serve as a model for other cities around the country that are just beginning to come to grips with the problem of lead poisoning and the relationship of the problem to race and class.

1. A conscious choice was made to use the terms "Black" and "White" rather than "African-American" and "European-American". Whereas the latter reflect cultural/origin attributes, the former reflect race consciousness/power used to support divisions within US society. This consciousness/power has allowed (some would say "encouraged"), and continues to permit, lead poisoning to disproportionately impact Black communities. A desire to counteract this means of division serves as the genesis for the environmental justice movement.
2. For more on the issue see "Urban Environmental Justice - Third Annual Stein Center Symposium on Contemporary Urban Challenges" *Fordham Urban Law Journal* Spring 1994
3. "The Inner City Environment" Environmental Quality: The Second Report of the Council on Environmental Quality August 1971 pg. 190
4. National Research Council - Committee on Measuring Lead in Critical Populations Measuring Lead Exposure in Infants, Children, and Other Sensitive Populations National Academy of Sciences 1993; Tesman, Johanna and Amanda Hills "Developmental Effects of Lead Exposure in Children" *Social Policy Report - Society for Research in Child Development* Summer 1994
5. Denno, Deborah W. "Considering Lead Poisoning as a Criminal Defense" *Fordham Urban Law Journal* Spring 1993 pg. 377 - 400
6. Schwartz, Joel "Societal Benefits of Reducing Lead Exposure" *Environmental Research* 1994 pg. 104-124
7. NHANES III had a phase 1 (1988-1991) and phase 2 (1992-1994). Phase 2 results have not yet been released, but early indications are that the number and distribution of children with elevated blood lead levels are not significantly different from the findings of phase 1. (Personal Communication with Debra Brody in Nov. 1995)
8. However, seven million tons of lead was spread over the U.S. before the phase out of leaded gasoline was complete in 1995.
9. Much of the information in this section was gathered from Brody, Debra J., et.al. "Blood Lead Levels in the U.S. Population" *Journal of the American Medical Association* July 27, 1994 pg. 277-283; Pirkle, James L., et.al., "The Decline of Blood Lead Levels in the United States" *Journal of the American Medical Association* July 27, 1994 pg. 284-291; and Mahaffey, Kathryn R., et.al., "National Estimates of Blood Lead Levels: United States 1976-1980" *New England Journal of Medicine* 1992 pg. 573-579, and Personal Communication with Debra Brody and James Pirkle in Nov. 1995.
10. Schwartz, Joel and Ronnie Levin, "Lead Poisoning in the U.S." *EPA Journal* March 1992
11. Agency for Toxic Substance and Disease Registry "The Nature and Extent of Lead Poisoning in Children in the United States: A Report to Congress" 1988; for more on this idea see Bullard, Robert Unequal Protection 1994

12. Calculated by determining the relative decrease of Black children with elevated blood lead levels ($77.1\%/97.7\% = 78.9\%$ decrease) and the relative decrease of White children with elevated blood lead levels ($79.5\%/85\% = 93.5\%$ decrease) and then determining the relative benefit accrued to White children ($93.5\%/78.9\% = 1.185\%$)
13. Approximately 340,000 Mexican American children also had elevated blood lead levels. This data was derived using 1990 Census Data and the findings of the Brody, et.al study. Asian-Americans, while little studied, show significant levels of lead poisoning (Chung, Angela "Childhood Lead Poisoning Among Asian Pacific American Populations" Honors Thesis, Stanford University, 1993). Native Americans are not included in any lead surveillance studies (Unpublished bibliography of lead poisoning in communities of color by the author in 1993).
14. Brody, Table 4; see also Centers for Disease Control "Preventing Lead Poisoning in Young Children" 1991 pg. 3
15. Sherman, Arloc Wasting America's Future - The Children Defense Fund Report on the Costs of Child Poverty 1994
16. Staes, Catherine, et.al. "Lead Poisoning Deaths in the United States 1979 Through 1988" *Journal of the American Medical Association* March 15, 1995
17. Natural Resource Defense Council "Think before you drink: the failure of the nation's drinking water system to protect public health" *Federal Register* Vol. 56 pg. 26467-26468 1991
18. Galbreath, M. "Lead Poisoning in Young Children: The Role of the Public Health Nurse" *Public Health Nursing* October 1992 pg. 551-552
19. "Baltimore passes regulation barring use of paint containing lead for interior of houses" *Industrial Health Monthly* November 1951 pg. 171
20. Berney, Barbara "Round and Round It Goes: The Epidemiology of Childhood Lead Poisoning, 1950-1990" *The Milbank Quarterly* Winter 1993 pg. 6-7
21. Eidsvold, G, et.al. "The New York City Department of Health: Lessons in a Lead Poisoning Control Program" *American Journal of Public Health* 1971 pg. 956-962
22. Centers for Disease Control and Prevention Preventing Lead Poisoning in Young Children October 1991 pg. 7-8
23. Bullard, Robert "Confronting Environmental Racism" South End Press 1993
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26. Denton, Nancy A. "Are African Americans Still Hypersegregated?" Residential Apartheid: The American Legacy University of California, Los Angeles 1994
27. LaVeist, pg. 55
28. Gant, Louise "The Applicability of Dispute Resolution Tools in Environmental Equity Disputes" Antioch University June 1995 pg. 53 - This Masters thesis examines lead poisoning prevention efforts in Baltimore in terms of the role of power in influencing the identification of goals, the selection of stakeholders, and the utilization of resources.
29. Payne, Patricia "Maryland's Unique Lead Poisoning Prevention Program: A Pro-Active Approach to Treating Lead Paint Hazards in Rental Units, While Preserving Housing Stock" Maryland Dept. of Housing and Community Development 1994
30. For example, how is a tenant supposed to be able to identify a lead hazard when inspectors go through a 3-day training to learn the same thing?
31. Wheeler, Tim "Lead paint proposal attacked" Baltimore Sun October 10, 1993
32. Gant, Louise
33. Environmental justice is defined by the Principles of Environmental Justice adopted at the First National People of Color Environmental Leadership Summit in Washington D.C. on October 27, 1991. One of the tests for environmental justice implicit in the Principles is the disparate impact test which examines whether different populations receive equal protection under the law (both in process and outcome). For more on the tests for environmental justice, see Gelobter, Michel in Race and the Incidence of Environmental Hazards by Bryant, Bunyan and Paul Mohai 1992 and Goldman, Benjamin *Not Just Prosperity - Achieving Sustainability with Environmental Justice* National Wildlife Federation 1994
34. Before the recent ban on lead in solder for canned foods and some agricultural pesticides (e.g. lead arsenate for citrus fruits), lead also threatened the fundamental right to clean food.
35. Maurci Jackson's response in "Putting the Pieces Together: Controlling Lead Hazards in the Nation's Housing" Report of the Lead-Based Paint Hazard Reduction and Financing Task Force 1995
36. Public Law 91-165
37. U.S. Code, Congressional and Administrative News Conference Report P.L. 100-426 pg. 3540: Stanford Environmental Law Journal 1990 pg. 65
38. Alliance To End Childhood Lead Poisoning "Understanding Title X - A Practical Guide to the Residential Lead-Based Paint Hazard Reduction Act of 1992" January 1993
39. Lead-Based Paint Hazard Reduction and Financing Task Force "Putting The Pieces Together: Controlling Lead Hazards in the Nation's Housing - Report" 1995 pg. 98-108;

Farquhar, Doug "Lead Poisoning Prevention: A Guide for Legislators" National Conference of State Legislatures August 1994 pg. 27-28; The staff of the National Center for Lead-Safe Housing

Appendix 1

Principles of Environmental Justice

Preamble

WE, THE PEOPLE OF COLOR, gathered together at this multinational People of Color Environmental Leadership Summit, to begin to build a national and international movement of all peoples of color to fight the destruction and taking of our lands and communities, do hereby re-establish our spiritual interdependence to the sacredness of our Mother Earth: to respect and celebrate each of our cultures, languages and beliefs about the natural world and our roles in healing ourselves; to insure environmental justice; to promote economic alternatives which would contribute to the development of environmental safe livelihoods; and, to secure our political, economic and cultural liberation that has been denied for over 500 years of colonization and oppression, resulting in the poisoning of our communities, and land and the genocide of our peoples, do affirm and adopt these Principles of Environmental Justice:

1. Environmental justice affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction.
2. Environmental justice demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias.
3. Environmental justice mandates the right to ethical, balance and responsible uses of land and renewable resources in the interest of a sustainable planet for humans and other living things.
4. Environmental justice calls for universal protection from nuclear testing, extraction, production and disposal of toxic/hazardous wastes and poisons and nuclear testing that threaten the fundamental right to clean air, land, water, and food.
5. Environmental justice affirms the fundamental rights to political, economic, cultural and environmental self-determination of all peoples.
6. Environmental justice demands the cessation of the production of all toxins, hazardous wastes, and radioactive materials, and that all past and current producers be held strictly accountable to the people for detoxification and the containment at the point of production.
7. Environmental justice demands the right to participate as equal partners at every level of decision-making including needs assessment, planning, implementation, enforcement and evaluation.
8. Environmental justice affirms the right of all workers to a safe and healthy work environment, without being forced to choose between an unsafe livelihood and unemployment. It also affirms the right of those who work at home to be free from environmental hazards.
9. Environmental justice protects the right of victims of environmental injustice to receive full compensation and reparations for damages as well as quality health care.
10. Environmental justice considers governmental acts of environmental injustice a violation of international law, the Universal Declaration On Human Rights, and the United Nations Convention on Genocide.
11. Environmental justice must recognize a special legal and natural relationship of Native Peoples to the U.S. government through treaties, agreements, compacts, and covenants affirming sovereignty and self-determination.
12. Environmental justice affirms the need for urban and rural ecological policies to clean up and rebuild our cities and rural areas in balance with nature, honoring the cultural integrity of all our communities, and providing fair access for all to the full range of resources.
13. Environmental justice calls for the strict enforcement of principles of informed consent, and a halt to the testing of experimental reproductive and medical procedures and vaccinations on people of color.
14. Environmental justice opposes the destructive operations of multi-national corporations.
15. Environmental justice opposes military occupation, repression and exploitation of lands, peoples and cultures, and other life forms.
16. Environmental justice calls for the education of present and future generations which emphasizes social and environmental issues, based on our experiences and an appreciation of our diverse cultural perspectives.
17. Environmental justice requires that we, as individuals, make personal and consumer choices to consume as little of Mother Earth's resources and to produce as little waste as possible; and make the conscious decision to challenge and reprioritize our lifestyles to insure the health of the natural world for present and future generations.

Appendix II

RESIDENTIAL LEAD-BASED PAINT HAZARD REDUCTION ACT OF 1992 (TITLE X)
STATUS OF REQUIREMENTS
September 1995

Title X Requirement	Agency	Status
SUBTITLE A. Lead-Based Paint Hazard Reduction		
Section 1011. Grants for Lead-Based Paint Hazard Reduction in Privately Owned Housing.	HUD	Round 1, 2, and 3 Lead Hazard Control Grants have been awarded to 56 grantees on the state and local level. \$279 million has been obligated, approximately \$15.5 million has been spent as of August 31, 1995. Expenditure rate is running at about \$2 million per month.
Section 1012. Evaluation and Reduction of Lead-Based Paint Hazards in Federally-Assisted Housing.	HUD	Proposed rule in preparation and expected to be published in late 1995.
Section 1013. Disposition of Federally-Owned Housing.	HUD	Proposed rule in preparation and expected to be published in late 1995.
Section 1014. Comprehensive Housing Affordability Strategy.	HUD	Implemented.
Section 1015. Task Force on Lead-Based Paint Hazard Reduction and Financing.	HUD	Final Report issued in July 1995.
Section 1016. National Consultation on Lead-Based Paint Hazard Reduction.	HUD, HHS, EPA and others	The Interagency Task Force on the Prevention of Lead Poisoning was formed in April 1989 and continues to meet.
Section 1017. Guidelines for Lead-Based Paint Hazard Evaluation and Reduction Activities.	HUD	Published in August 1995.
Section 1018. Disclosure of Information Concerning Lead Upon Transfer of Residential Property.	HUD, EPA	Proposed rule published in November 1994. The final rule is in preparation, with publication planned for late 1995.

Title X Requirement	Agency	Status
SUBTITLE B. Lead Exposure Reduction -- this subtitle is comprised of section 1021 which amends the Toxic Substances Control Act (TOSCA) by adding a title IV to the Act that contains the following sections:		
Section 402. Lead-Based Paint Activities Training and Certification. a. Accreditation of Training Programs b. Accreditation and Certification Fees c. Renovation and Remodeling -- Guidelines and Field Exposure Study	EPA	a. & b. Proposed rule published in September 1994. Final Rule in preparation; final promulgation planned for autumn of 1995. c. Guidelines for the Conduct of Renovation and Remodeling was published in April 1994. The field exposure study component of this section has evolved into three distinct studies, two of which have been completed and are in the peer review stage. The third should be completed by spring of 1996. The process of formulating policy and potential regulations will likely begin by January 1996.
Section 403. Identification of Dangerous Levels of Lead.	EPA	Guidance document issued in July 1994. This serves as interim advice while work continues on the proposed rule, with publication planned for autumn of 1996.
Section 404. Authorized State Programs. a-f, h. State and Model State Programs g. Grants to States to develop and carry out LBP activities in the States	EPA	a-f, h. Proposed rule published in September 1994. Final Rule in preparation; final promulgation planned for autumn of 1995. g. During its second year of operation, \$12.2 million was issued in March 1995 (FY 1995) to 42 States to develop model state programs as well as to fund training and certification programs in DC and 16 Native American tribal lands. In FY 1994, EPA allocated \$11.2 million in grant funding to 46 States, the District of Columbia and 17 Native American tribes.

Title X Requirement	Agency	Status
Section 405. Lead Abatement and Management a. Comprehensive monitoring, detection, and abatement program b. Lab performance standards, certification, and voluntary accreditation programs c. CDC studies of sources of lead exposure in children, NIOSH studies to reduce occupational lead abatement exposure - d-e. Public education, outreach f. Product assurance	EPA, NIEHS, NIOSH, NSC, NIST	a. EPA efforts under section 405a are the same as those performed under sections 1051 and 1052. b. The National Lead Laboratory Accreditation Program (NLLAP) and Environmental Lead Proficiency Analytical Testing Program (ELPAT) were implemented in the spring of 1993. c. CDC has numerous on-going studies to identify sources of lead exposure including the Mahoning County Study to determine the risk for elevated blood lead levels among children who live in housing of different ages (data collection completed, report preparation in progress), the Montefiore Study to identify risk factors for EBLs among children at the Center's satellite primary care centers (data collection in progress), the FBI Firing Range Study to evaluate the risk of lead exposure incurred by members of households in which at least one person worked at an FBI firing range (data collection completed, report preparation in progress), the St. Louis Lead and Day Care Study to evaluate sources of exposures at day care centers (target completion in 1996), the Isotope Analysis Study to determine whether the analysis of isotope ratios of lead in blood and environmental samples provides a means by which to differentiate between various sources of environmental lead and to link sources of lead in the environment with lead in children's blood (report to be completed in late 1995), the Source Apportionment of Lead in Household Dust Study to analyze the various sources that contribute to lead accumulation in house dust of urban dwellings by measuring stable lead-isotope ratios and multi-element "fingerprints" (undergoing lab analysis, to be completed in 1996). Other recent reports that have been completed on less common sources of lead exposure, such as water, inadequately fired pottery, and folk remedies include "Lead Contaminated Drinking Water in Bulk-Water storage Tanks -- Arizona and California"(1993) and "Lead Poisoning Associated with Use of Traditional Ethnic Remedies"(1993). NIOSH plans to publish its comprehensive report "Means to Reduce Hazardous Occupation Lead Abatement Exposures" in late 1995. - d-e. The National Lead Information Center Hotline and Clearinghouse was created in 1992 to provide the general public and professional audiences with information about lead poisoning and prevention. It was established under a cooperative agreement with EPA, HUD, CDC, and DOD. The Interagency Lead-Based Paint Task Force has formed a subcommittee on public education issues. f. HUD, EPA, the National Institute of Standards and Technology, and the American Society for Standards and Materials (ASTM) are developing standards for encapsulants.

Title X Requirement	Agency	Status
Section 406. Lead Hazard Information Pamphlet a. Publication b. Regulations requiring renovators to provide brochure to customers	EPA	a. Pamphlet available for distribution August 1995 b. Proposed rule published in March 1994. Final rule in preparation, with publication planned for autumn of 1995.
SUBTITLE C. Worker Protection		
Section 1031. Worker Protection	OSHA	Interim final regulation on occupational exposure was published in May 1993. OSHA does not interpret section 1031 as requiring a final regulation.
Section 1032. Coordination Between EPA and Department of Labor	EPA, DOL	No formal permanent committees have been formed in response to Title X. The ONE Committee was formed prior to Title X to coordinate the efforts of NIOSH, OSHA, and the EPA in lead poisoning prevention activities.
Section 1033. NIOSH Responsibilities a. Grants for Training Workers and Supervisors Evaluation of Programs 467	NIOSH, in conjunction w/ EPA	a. NIOSH and EPA award grants for training workers and supervisors in lead-based paint activities. Their review panels work together but the two agencies award separate grants. In FY 1994, EPA awarded \$2.8 million and NIOSH awarded \$0.5 million. EPA expects to award \$1.55 million in FY 1995. NIOSH will not make any awards in FY 1995 because money was not appropriated. b. No funds were appropriated for NIOSH to assess the efficacy of the worker and supervisor training programs developed by the grantees.

Title X Requirement	Agency	Status
SUBTITLE D. Research and Development		
Section 1051. Research on Lead Exposure from Other Sources, including exterior soil and interior lead dust in carpet, furniture, and forced air ducts	HUD, EPA	HUD and EPA have begun research to development guidance on dust mitigation in residential carpets and upholstery. Information will be developed on the percentage of lead-dust loading in different residential fabric-type materials that can be reduced by alternative vacuum/ cleaning protocols. (HUD IAA 93-53 with EPA, Task 13, Budget Period to 7/31/96). EPA completed the Comprehensive Abatement Performance Pilot Study (CAPS), which sampled lead dust from forced air ducts (among other locations), and published results in February 1995. An EPA article, "Lead in Paint, Soil, and Dust" was published in ASTM publication #12-26. HUD completed a study of reducing lead dust in air ducts at the Cambridge, MA public housing agency.
Section 1052. Research on testing technologies and hazard reduction methods	HUD, EPA, NIST	The following studies of testing technologies have been completed or are presently on-going: 1. Evaluation of Test Kits and XRF Devices: "A Field Test of Lead-Based Paint Testing Technologies" both the Technical and Summary Reports were published by EPA in May 1995. Additional HUD funding for continued evaluation has been provided. Performance Characteristics Sheets for each model of XRF analyzer have been published. (HUD IAA 93-53 with EPA, Task 2, Budget Period to 7/31/96) 2. Paint Inspection Chapter of HUD Guidelines: While the Guidelines were published in July 1995, work continues to improve on Chapter 7, Paint Inspection. Revisions are expected in late 1995. (HUD IAA 93-53 with EPA, Task 9, Budget Period to 7/31/96) 3. The National Institute of Standards and Technology is developing a standard XRF evaluation system to be completed July 1996. 4. Composite Dust Wipe Analysis Protocols: This on-going study is testing lab analysis methods for composite samples. (HUD IAA 93-53 with EPA, Task 10, Budget Period to 7/31/96)

Title X Requirement	Agency	Status
Section 1052. Research on testing technologies and hazard reduction methods (cont.)	HUD, EPA, NIST	The following studies of hazard reduction methods are presently on-going: 1. Evaluation of the cost and effectiveness of alternative hazard reduction methods used in the HUD Lead-Based Paint Hazard Reduction Grant Program: This is a long-term study that will have periodic interim reports beginning in late 1995. 2. Repair and Maintenance Study (Farfel, Baltimore): This is an on-going long-term study that looks at the efficacy of low-cost intervention techniques. 3. Encapsulant Testing: This study analyzes the performance of selected coatings in laboratory tests proposed by ASTM. Completion of the project is expected in the autumn of 1995. (HUD IAA 93-53 with EPA, Task 5) 4. Evaluation of Cleaning Products (detergents): This study compares the effectiveness of various cleaning agents in removing dust lead from different surfaces. Expected completion is late 1996, (HUD IAA 93-53 with EPA, Task 8) 5. Study on the Efficacy of Educational Efforts on Blood Lead Levels (Milwaukee): Distribution of final report expected in the autumn of 1995. (EPA) 6. Report on the Seasonality of Blood Lead Levels: The report looks at blood level trends by the time of year and age of the children. Report published in September 1995. (EPA) 7. Operations and Maintenance Course: EPA is developing a curriculum, with video, for workers conducting interim controls and routine maintenance on surfaces with lead-based paint. (HUD IAA 93-53 with EPA, Task 12, Budget Period to 7/31/96) 8. Single Family Property Disposition Study: The demonstration will (1) estimate the costs of compliance with the possible requirements of section 1013, and (2) ensure that HUD field offices are capable of efficient procurement and monitoring of contractors and services. Expected to be completed in April 1996. (HUD)
Section 1056. Federal Implementation and Insurance Study	GAO	a. Implementation/ Section 8 Study was published in May 1994. b. Availability of Insurance Study was published in July 1994.

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Baltimore Urban Environmental Initiatives Program
Lead Poisoning Prevention Project

The City Health Department's Urban Environmental Initiatives Program will distribute over 2500 cleaning kits in an effort to promote wet cleaning over dry sweeping as a household cleaning method. Wet cleaning is recommended in older urban housing as one way a resident can help to reduce the elevated dust lead levels which often accumulate in such homes. To date, over 1,300 kits have been distributed throughout Baltimore City.

The cleaning kits are comprised of a series of educational tools and six custodial items. Each kit includes the following custodial items: a 10 quart plastic bucket with handle; a household sponge mop and a replacement sponge head; one pair of fleece-lined, latex gloves; a pack of sponges (3" x 5"); and a box of cleaning detergent, containing at least 5% phosphates.

The pair of latex gloves are included due to the sensitive reaction some people's skin is known to have to the phosphate in the detergent. Also, it cannot be assumed that every family will have access to an adequate wash bucket, so it is necessary to provide one with each kit. A pack of multi-colored sponges is provided with each kit, and the recipient is instructed to "use the blue sponge to wash the window wells only, and always use the yellow sponge to wash the window sills." This instruction will focus attention on the areas which need extra cleaning, and emphasize the importance of not spreading lead from one area to another.

The cleaning kit educational tools include: A copy of "Derek the Dinosaur's Coloring Book about Lead"; a full color brochure called "Your Children and Lead Poisoning", a brochure titled "Your Child, Food and Lead Poisoning"; typed cleaning instructions; and a Resource List providing numbers for parents to call to get more information.

There are currently nineteen (19) participating programs in the lead cleaning kit distribution network established by the UEI Lead Poisoning Prevention Project of the Baltimore City Health Department (BCHD). Sixteen (16) of these programs are health clinics with a pediatric emphasis; two (2) are programs with a lead-paint abatement or a lead-risk reduction focus; one (1) is a non-profit, child-advocacy group.

With rare exception, these programs report that the cleaning kits have improved their staff's ability to provide families with good quality education about the importance of cleaning for lead dust. Although the cleaning kits are not a substitute for lead hazard abatement or lead risk reduction activities, they may be credited with sustained drops in blood leads when used properly and in conjunction with education and environmental intervention.

For example, the HUD-funded Lead Abatement Action Project (LAAP) reports that the kits provide a good opportunity to talk about where to clean, and the importance of diet, handwashing, and continued blood lead testing. Home demonstrations of the kit components help parents to see how to mix the detergent properly, and give the staff a chance to observe the family using the materials.

The Kennedy Krieger Institute (KKI) Community Lead Poisoning Prevention and Treatment Center has found that efforts to educate parents about the importance of cleaning for lead dust are greatly assisted by the offer of a free cleaning kit. A few families who were initially reluctant to have a home visit and cleaning demonstration done by the program staff changed their mind when told that they would receive cleaning kits.

Before the cleaning demonstration, families see how dirty the window wells were. After a few minutes, they see how clean the wells could and should be. The importance of cleaning floors and other horizontal surfaces is also explained.

Families are glad to receive a new mop and a replacement sponge to clean their floors. Some families previously did not have mops, and only swept their floors. Now they are able to clean their floors more appropriately for lead dust.

Another KKI program, which distributes the cleaning kits as one part of an environmental intervention in homes of at-risk children, notes that the kits are a great educational tool. Discussing the kit provides an opportunity to summarize what risk-reduction activities have been done in the house and to point out areas where lead-bearing dust might re-accumulate. Additionally, the cleaning kits give the child's family the chance to participate in the risk reduction activities, allowing them to be proactive about the problem - not just to comply as treatments are completed in their homes.

The staff at participating medical clinics are equally enthusiastic about this new resource. "The clients are really very appreciative of all that is in the kit. We have a lot of low-income families who would otherwise be unable to follow through on the cleaning instructions given to them", reports a community health nurse.

Many of these clinics administer to clients who are limited both financially and educationally. "Visual aids are so important with this population", says one clinic nurse. "Unfortunately, the reality is that many of my patients can't read." The availability of the cleaning kits in the clinic affords hands-on education, which really makes a difference in these cases. "Clients really understand the cleaning process better", affirms another community health nurse.

The BUEI Lead Poisoning Prevention Project has also produced an educational video which is designed for use with the parents of lead poisoned children. The video is just eight and one-half minutes long and presents general information on the causes and effects of lead poisoning, as well as specific recommendations on preventive measures that families can take.

If you would like to incorporate any of the BUEI Lead Poisoning Prevention Project resources into your program, or would like more information, please call Ruth Quinn, Program Administrator for the BUEI Lead Poisoning Prevention Project, at the Baltimore City Health Department, (410) 396-6970.



**National
Medical
Association**

Environmental Protection Agency
Radon Education Program
1012 Tenth Street, N.W.
Washington, DC 20001

**A COOPERATIVE AGREEMENT BETWEEN THE NATIONAL
MEDICAL ASSOCIATION (NMA), AND THE U.S.
ENVIRONMENTAL PROTECTION AGENCY (EPA), TO
PROMOTE RADON AWARENESS, TESTING AND MITIGATION
IN THE AFRICAN-AMERICAN COMMUNITY**

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ABSTRACT

The National Medical Association's Radon Education Program, through a cooperative agreement with the U. S. Environmental Protection Agency, is educating African-Americans to accept personal responsibility for preventing exposure to radon and health risks associated with radon.

KEYWORDS

Radon; Radon Education Program; African-American; National Medical Association; U. S. Environmental Protection Agency

**THE NATIONAL MEDICAL ASSOCIATION'S RADON
EDUCATION PROGRAM, INITIATED TO EDUCATE
AFRICAN-AMERICAN COMMUNITIES**

The National Medical Association, founded in 1895, is a professional organization that represents 20,000 African-American physicians in the United States, including Puerto Rico and the Virgin Islands. The National Medical Association actively addresses all issues impacting the ability of its members to deliver quality health care.

The Radon Education Program was initiated with the National Medical Association because of its physician coalitions throughout the nation. The National Medical Association's physicians have extensive experience in delivering community-wide prevention and promoting activities which have the ability to reach many African-Americans, unfortunately, most of whom are prime candidates for immediate and short-term environmental and life threatening ills which affect basic survival.

Moreover, radon is the second-leading cause of lung cancer deaths in the United States each year. African-Americans suffer from diseases of the lung, particularly lung cancer, at a disproportionate rate.

Lung and bronchus cancer is the leading cause of excess mortality in African-American men and the second-leading cause in African-American women. In addition, exposure to radon coupled with cigarette smoking increases the risks of developing lung cancer. This combination of risk factors is particularly significant because cigarette use is more prevalent among African Americans than Caucasians. Most recently, the U. S. Environmental Protection Agency expanded our cooperative agreement to include the Secondhand Smoke Awareness Program. This expanded cooperative agreement presents us an opportunity to further address and impact environmental ills that affect African Americans.

Radon is a naturally occurring radioactive gas that is emitted from soil and accumulates indoors. Radium, which releases radon, is commonplace in the earth's crust. The radon gas seeps through porous soils under homes or buildings and enters through gaps and cracks in the foundation or insulation, pipes, walls or other openings.

An estimated 6 million homes in the United States may have indoor radon levels at or above the Federal government's recommended action levels. This equates to nearly one out of every 15 homes. Risk factors for developing lung cancer from radon depend mostly on how much radon is in your home, the amount of time spent in your home and whether you are a smoker or have ever smoked. Unfortunately, nationwide surveys have indicated that the level of awareness of the risks presented by radon exposure is only 48% among African Americans compared to 77% among Caucasians.

It is difficult to convince the African-American community of the dangers of radon because there is no physical evidence of the existence of radon gas; people cannot see or smell radon gas; people usually feel safe in their homes; and radon gas is just another health risk or environmental hazard among many that is a part of everyday life.

To help reduce the rates of lung cancer in African Americans, the National Medical Association entered in a cooperative agreement in 1992 with the U.S. Environmental Protection Agency to promote radon awareness, testing and mitigation in African-American communities. Through our pilot program in Louisville, Kentucky, we have reached in one year, 25% of the African-American population through health fairs, frequent television and radio spots, verbal and visual presentations at local, state and national meetings, print material distribution and coalitions with community organizations.

Approximately, 4,000 radon fact sheets and 1,000 radon test kits were distributed during January 1993 - June 1994. Fifty percent of the distributed radon test kits have been utilized and test results returned to Louisville residents. Our pilot program had a Health Jamboree in Louisville in June 1994 with over 1,000 community members in attendance. This Jamboree was the result of partnerships with the U.S. Environmental Protection Agency, the National Black Caucus of State Legislators, American Heart Association, Louisville Fire Prevention Bureau, St. Stephen Baptist Church and many other organizations.

The target population in Louisville, Kentucky, was receptive to risk information about radon. Our pilot city coordinator, a well-known Pediatrician and community activist was recognizable to the target population. Beverly M. Gaines, M.D., was a frequent face and voice to African

Americans. Dr. Gaines appeared regularly on television talk shows and radio programs discussing various health risks. The community attended the health jamboree in large numbers and three out of four persons knew about radon from watching television and listening to the radio. The community was interested in learning more about radon and receiving test kits to test their homes. In this African-American community, people were familiar with the messenger and the message. The credibility of the messenger in the African-American community is very important. Historically, physicians, educators and religious leaders are well respected in our communities. Knowledge, attitude, practice and tradition plays a big part in the African-American community being receptive to health risk information.

The National Medical Association has been most effective in radon awareness in a coordinated community-based setting such as a health jamboree. This type of event brings schools, churches, physicians, businesses, civic organizations and Federal and local governments together to promote health awareness and disease prevention activities.

A component of our Radon Education Program consists of training and awarding mini grants to physicians, physician coordinators and community leaders so that the program can be implemented in their respective community. Recently, our program coordinator in Cleveland, Ohio participated in a health fair which reached over 6,000 community members. Health fairs have been an extremely successful method of reaching the African-American community. In fact, the U.S. Environmental Protection Agency has recommended that we continue reaching the target population through health fairs across the Country.

At a Radon Public/Private Partnership meeting in December 1993, the National Medical Association's Radon Education Program received an outstanding achievement award from the U.S. Environmental Protection Agency in recognition of leadership, dedication and contributions toward reducing the public health risk of indoor radon gas.

We are vigorously reaching out to our communities through participating in educational programs with schools, universities and churches. In addition, the Radon Education Program is being presented and exhibited at national and state meetings and conventions. The Program staff is writing articles, abstracts and books to educate all segments of the African-American population. Several of our articles have appeared in national magazines. The staff presented a poster exhibit at the American Public Health Association's Convention. The National Medical Association is implementing the Radon Education Program on a national level and is expanding its outreach activities to promote environmental justice and equity.

SUSTAINABLE COMMUNITY DEVELOPMENT

**MEASURING THE SUCCESS OF THE BROWNFIELDS INITIATIVE:
AN URBAN ENVIRONMENTAL JUSTICE PERSPECTIVE**

BY

**Joi Ross and Arthur Glazer
PRC Environmental Management, Inc.**

**Presented at the Symposium on Applied Research and Education
Addressing Urban Environmental Justice Issues Applicable to Baltimore, Maryland**

**Morgan State University, Baltimore, Maryland
October 21-22, 1995**

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The Brownfields Initiative is a relatively new program to help revitalize our cities and other areas across the country. The purpose of the Brownfields Initiative is to help communities redevelop properties in order to reduce potential health risks and turn the properties into productive economic assets. The U.S. Environmental Protection Agency (U.S. EPA) is currently awarding grants for up to 50 pilot projects across the country. The city of Baltimore was recently selected as a Brownfields pilot project.

By definition, Brownfields are land or buildings that are abandoned or underutilized and whose redevelopment is complicated because of the real or perceived threat to the local community from known or potential contamination from these properties. The uncertainty about future liability of potential developers also complicates the issue. There is no question that redeveloping urban areas can be an extremely challenging process. When land or buildings that have been contaminated with hazardous substances are involved, the process is much more complicated. This is because decisions need to be made regarding how clean the land or building needs to be in order to be used as part of the redevelopment effort. Then comes the question of who will pay to clean the site to the level of cleanup that has been selected. Currently there are very limited funds at the state or federal level to support this effort. So, the likeliest sources of funds are banks and other private investors. However, their willingness to support Brownfields redevelopment is complicated by the potential liabilities imposed on them under state and federal Superfund laws. Though they are innocent parties who had nothing to do with contaminating the sites, the current Superfund law provides for joint and several liability of current and past property owners and operators. Thus, developers of Brownfields sites could potentially be held liable for contamination that occurred before they obtained ownership

of the sites. Historically, this has caused potential investors to shy away from investing in any efforts to redevelop these properties.

This issue is currently under scrutiny by many states and the U.S. EPA. Many states are providing letters to parties that have moved forward with good faith voluntary cleanups. The letters essentially say that the state will not take any further action against the parties conducting the cleanups or parties who subsequently buy the property. Some states have implemented initiatives that change the way that their cleanup programs are governed. For example, Minnesota encourages productive reuse of formerly contaminated properties and protects parties who voluntarily investigate and conduct cleanup activities from future legal liability under state law. Pennsylvania has instituted a "greenfields initiative" that encourages redevelopment and reuse of Brownfields sites while minimizing penalties to property investors. Under Pennsylvania's initiative, prospective buyers conduct a comprehensive site assessment. If remediation is required, the seller enters into an agreement with the state to formulate a cleanup plan. In Pennsylvania, the Department of Environmental Resources formally agrees to protect buyers from liability for future remediation for conditions identified during the site assessment. Buyers do remain liable, however, for any contamination not identified in the initial assessment. Michigan is another state attempting to remove roadblocks to development and reuse of Brownfields properties. Michigan's initiative includes covenants not to sue innocent buyers of sites that are later found to have been contaminated. These are just a few initiatives that some states have undertaken to deal with liability issues that can complicate Brownfields redevelopment.

Many Brownfields properties are under review by state environmental protection agencies, or the U.S. EPA to identify opportunities to clean these sites. Because many of these properties are located in heavily populated minority and/or low income areas, such as Baltimore, urban environmental justice issues will need to be addressed in order for this program to be successful. While economic and liability issues clearly exist and must be addressed, this paper focuses primarily on the urban environmental justice issues that are likely to be central to any Brownfields redevelopment project.

Through our work for federal clients such as U.S. EPA and DoD, we have had the opportunity to learn about the impressions, opinions, and concerns of many urban communities throughout the country that will most likely be affected by Brownfields redevelopment projects. To a large extent,

information that we have gleaned first-hand from these communities has greatly framed our perspective of the environmental justice issues that will have to be addressed.

The Brownfields Initiative will require participation and cooperation from a broad range of parties in order to be successful. These parties include individuals and elected officials from the local community, civic and grass roots organizations, labor unions, local industry, developers, lending institutions, insurance companies, and representatives from state and federal agencies. Some of the participants deal with environmental justice issues on a daily basis, while other individuals who will become part of the process will be exposed to environmental justice issues for the first time. Because of the divergent and sometimes opposing interests of these parties, the roles and responsibilities of each participant must be defined in advance to assure everyone's participation is real and meaningful. The bringing together of these parties also presents a special challenge because: (1) a level of trust must be established since most of the parties have not worked together before, and (2) the interests of the individuals vary and at times may oppose each other.

So now that we have set the stage here, how will we be able to measure the success of the Brownfields Initiative? One of the key purposes of the Brownfields Initiative is to promote economic redevelopment, which can be measured in obvious ways, such as the number of new jobs, dollars of increased tax revenue, or dollars of state or federal grant monies awarded for community redevelopment. But the Brownfields Initiative has the potential to be considerably more than just economic redevelopment. In fact, the process can be a significant force in urban revitalization, which is much more than just redevelopment. It is a process that can have far reaching value to the community and offer many more tangible and intangible benefits that can be measured as successes for urban environmental justice programs.

Our research shows that many benefits will likely accrue to local communities, and many of them are at the core of resolving environmental justice issues. These benefits include: (1) the breaking down of barriers and establishment of a framework for long-term positive working relationships among all stakeholders; (2) the encouragement and support for local communities to position themselves to take more control of their destiny; (3) the emergence of a more unified and/or new community leadership; (4) the potential for reduced prejudice; and (5) the potential for reduced health risks and opportunities

for the public to learn more about environmental management issues. We discuss each benefit, in terms of the context within which it will likely emerge, in the following paragraphs.

Benefit: The Breaking Down of Barriers and Establishment of a Framework For Long-Term Positive Working Relationships Among All Stakeholders

As previously stated, all stakeholders will have to cooperate and coordinate with each other in order for any Brownfields project to be successful. By virtually forcing individuals to sit in a room to work together on a common project, many barriers can be broken down and a framework can be established for a long-term working relationship among the participants. By working together in an open public forum, individuals will have the opportunity to listen to all points of view, as well as the pros and cons of ideas from all of the diverse parties. And hopefully, through this process, thoughts and ideas will emerge that represent a common ground that two, three, or four factions will start to rally around and move forward on. Now, it is naive to think that everyone will buy into everything, but experience has shown that more commonality among parties involved may exist in situations like this than people would believe when they start a complex process like urban revitalization. Open, participatory up-front dialogue is critical for ensuring that community needs and opinions are taken into account when decisions are formulated about the intended outcomes of redevelopment projects. In addition to breaking down barriers and establishing the framework for long-term relationships and partnerships among all parties involved, this type of dialogue increases the likelihood that local communities will "buy into" the projects and view them as successful. Failure to have community input during the planning stages almost always guarantees that resentment and tensions will exist within the community that will have to be addressed later. Additionally, such resentment and tensions can become impediments to progress.

Benefit: The Encouragement and Support For Local Communities To Position Themselves To Take More Control of Their Destiny

A successfully executed Brownfields project will put a lot of stake in input from the local community, thus providing the community a great opportunity to step up and exert itself and take control of its destiny. One of the biggest community criticisms of many major urban renewal projects is that the developers come in and push the local community out. This includes local workers who may be excluded from jobs created during the redevelopment process. The issue of local jobs for local workers appears to be a major concern of urban communities near potential or existing Brownfields sites around the country. From the community's perspective, economic development should result in

enhanced economic conditions of local residents, not just enhanced economic conditions of developers and lenders. If the local community can rally around the Brownfields effort at the beginning of the process, then the tone will be set for unification on other issues that may impact the future or destiny of the community.

Benefit: The Emergence of a More Unified And/Or New Community Leadership

As with any process involving many stakeholders with diverse interests, new leaders will emerge. Whether they be individuals with special expertise or interests, or individuals who have time to devote, they will emerge. So, the opportunity will exist for new individuals to come to the forefront on local issues, such as environmental justice, and work with other stakeholders toward resolution.

Benefit: The Potential For Reduced Prejudice

Because the Brownfields Initiative is focused on urban revitalization, diverse populations and individuals of various ethnic and racial backgrounds that most likely reflect the makeup of the city will be involved. This includes members of neighborhood associations or grassroots organizations. There will probably be many instances where real or perceived prejudices exist among the participants from these groups. As mentioned earlier, it is critical that representatives from each major stakeholder group be included up front in discussions and decisions regarding how the project will proceed, whether jobs will be available for local workers, what the intended end result of the project will be, and what the future land use options will likely consist of. Often times, prejudices arise out of misunderstandings, lack of information, or both. These things can be avoided, or at least the potential for their occurrence can be decreased, by the up front establishment of positive working relationships among all parties involved. In order to move forward, all stakeholders must work together. This "forced" working relationship has great potential to help break down barriers and reduce the prejudice.

Benefit: The Potential For Reduced Health Risks and Opportunities For the Public to Learn More About Environmental Management Issues

A significant benefit to local communities is decreased health risks. In order to turn contaminated property into productive property again, some level of cleanup or stabilization will need to occur. The level will likely depend upon the planned use for the land or building. For example, contaminated land that will be covered over for a parking lot will likely require less cleanup than land

that will be used to locate a new school. Historically, decisions about appropriate cleanup levels have not been easy ones. Frequently, local communities are at odds with developers and state and federal regulators over this issue. The local community generally wants the property cleaned up to pristine conditions, or as close to pristine as possible, which can prove to be costly. On the other side of the issue are the individuals who have to pay for the cleanup and are concerned about costs. This includes state or federal agencies or the parties responsible for the contamination, if they can be identified. But no matter how this plays out for a Brownfields site, the level of contamination at the end of the process will generally be far less than before the process began. This results in a reduced level of health risk, which is a significant benefit to local residents.

Continuing in this same vein, all individuals who are part of the process have a great opportunity to learn more about environmental management issues. Whether it be developing a better understanding of how sites become contaminated, how potential risks are estimated, or how cleanup alternatives are evaluated, there is a great learning process. Stakeholders in the process can use this learning experience for other arenas. For example, once someone has a better appreciation for the damage caused by hazardous substances, they can better appreciate the importance of programs such as pollution prevention and can become an advocate for those programs. Local residents may particularly benefit from general knowledge gained through their involvement in the process, as well as from training opportunities that may arise as part of the overall development plan. Training opportunities can prepare local residents to obtain local jobs that may become available during cleanup or construction activities. Secondary benefits are also likely to accrue to all stakeholders. One secondary benefit to all stakeholders is a better appreciation for the fact that undoing past environmental problems is not always an easy matter and that sometimes compromises need to be made by all parties concerned.

This paper has focused on ways to effectively address environmental justice issues, which satisfies only one ingredient for a successful program. Another key ingredient for making the Brownfields Initiative a success is the economic support of private investors. State and federal dollars may not exist in sufficient quantity to move these programs very far. Some government funding may be available to help start the process, and maybe to help support some level of cleanup. Also some historic programs, such as loans from the Small Business Administration or HUD block grants may come into play. However, for the most part, private investment will have to play a significant role.

Private investment may involve banks, private organizations, or virtually any entities typically involved in real estate development projects. This is where the process can get very interesting. Many urban redevelopment projects have moved forward with little or no thought about the potential impacts on the local communities. And, in fact, many potential investors probably have not been involved in a public participation process where environmental justice issues are involved, and where these concerns must be addressed in order for the project to move forward. This crossroad will provide for interesting decision making as investors attempt to move forward and start earning a return on their money while the concerns of the local community arise as a force that must be dealt with in order for the process to proceed in a positive light.

In spite of this potential challenge, we believe that private investors will step up to the plate because many of the Brownfields properties present a wonderful opportunity for redevelopment, and more importantly revitalization. Also, as mentioned earlier, many states have begun to take steps to address liability issues and encourage investment. States do impose strict standards and require detailed site analyses prior to cleanup. The interesting factor here is that each analysis is site specific. Each situation is viewed individually and is not necessarily analyzed on the basis of statewide or national standards. This process provides for the "unlocking" of many properties that previously might have been entangled in state or federal regulatory structures. In the absence of a site-specific process for analyzing the properties, barriers created by these structures could potentially reduce the perceived value of urban properties targeted for redevelopment.

And finally, the Brownfields Initiative provides a model for other urban development projects. There is no reason why the lessons learned and the framework developed cannot be applied to many other situations where participants come from a range of interests and experience. We are confident that all of the participants in the Brownfields Initiative will learn a great deal from the process. This can be increased technical knowledge, or knowledge about state and federal environmental programs, or knowledge about real estate development projects. But potentially the most important will be the knowledge gained from working with others in sensitive situations, such as those frequently encountered when environmental justice issues are put on the table.

In summary, the Brownfields Initiative is one that is long overdue. The initiative has the potential to help revitalize, or put the heart back into urban areas across the country. While focusing on the end

result of redevelopment and revitalization, we must not lose site of the process required to reach the end result. We must take advantage of the knowledge that will be gained along the way, and engage in efforts to evaluate progress and take whatever steps necessary to improve the process along the way to ensure that benefits accrue to all stakeholders. This is going to be an extremely challenging process, there is no doubt about that. But sometimes the bigger the challenge, the greater the benefits.

Sustainable Community Development:
The Role of Law School Clinics in Aiding Baltimore's Communities

Urban Environmental Justice:
The Role of Law School Clinics in Aiding Baltimore's Communities

by Prof. Jane Schukoske
University of Baltimore School of Law

Much of government and of the American public have been blind to racial inequity, or, at worst, been biased in public decision-making in the past. Realizing the blindness and bias, the government has now begun to reevaluate its decision-making processes and to consider how to address disproportionately high and adverse human health or environmental effects on people of color and low-income populations. President Clinton's Executive Order¹ has caused agencies to confront the issue and develop strategies to address planning processes for the future and current enforcement policy and activities.

At a number of urban universities around the country, law school clinics have been developed to address environmental injustices.² Since January, 1995, the University of Baltimore (UB) School of Law has operated an Environmental Justice Project in its Civil Clinic to primarily assist community groups in Baltimore City.

This essay discusses some of the insights we have had about environmental justice efforts in Baltimore and suggests ways in which law school clinics may assist low income communities.

Environmental Justice Project of the Civil Clinic
at the University of Baltimore School of Law

The University of Baltimore Environmental Justice Project (EJP) of UB's Civil Clinic represents low income individuals and community groups on environmental issues in the metropolitan Baltimore area. Begun in the spring, 1995 semester, the Project is offered one semester per year to provide free legal services to low-income and minority communities facing environmental hazards and to train law students to become effective environmental

¹ Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (February 11, 1994).

² Golden Gate Law School in San Francisco, Tulane Law School in New Orleans, Georgetown University Law Center in Washington, D.C., and Boston College School of Law, to name a few, began clinics in recent years. University of Maryland School of Law operates an Environmental Law Clinic.

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advocates for these communities.

Individuals and groups in Maryland's low income and minority communities often need legal assistance to reduce or eliminate the environmental risks they face. Environmental problems are complex: the information needed to assess the problem includes laboratory or field testing, and there is a web of laws that may apply.³ In addition to representing families in which there are lead poisoned children to assist them in obtaining safe housing, EJP student attorneys have collaborated on work for a neighborhood situated next to an automobile shredder which has polluted the area for twenty years, advised neighbors next to a landfill, advised neighbors next to an abandoned gas station, and testified on legislation.

EJP Activities

Under close faculty supervision, student attorneys in the UB Civil Clinic's EJP provide direct legal assistance, counseling, and education to members of disadvantaged communities on environmental matters. Clinic students are certified under the Maryland Rules of Admission to the Bar to perform all tasks of an attorney under the direct supervision of a faculty attorney. Student attorneys meet potential clients, conduct initial interviews, investigate their cases, and develop legal advice and strategies. At the client's direction, these strategies are implemented by the student attorneys, who draft legal documents, counsel clients, litigate, testify on legislative and regulatory proposals, negotiate with opposing parties, and perform other professional tasks. The students staff the Clinic for 20+ hours each week during the semester, and receive six units of academic credit.

An EJP student attorney's learning activities include both formal instruction, community education and client representation. Supervising faculty conduct weekly supervision meetings with each student at which she presents her work briefly, summarizing its current status and identifying issues or tasks yet to be performed. Also, supervisors meet weekly with teams of students - between two and six on a project - to discuss ongoing work. These meetings allow close faculty supervision and collaboration among students as professionals. A weekly seminar includes instruction in skills training (interviewing, counseling, drafting, case theory development, oral advocacy, trial skills, and community relations and education) and substantive legal issues, as well as a structured discussion in which students reflect on the lessons they

³ See Adam D. Schwartz, The Law of Environmental Justice: A Research Pathfinder, 25 Environmental Law Reporter 10543 (1995).

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have learned handling cases. The seminar also teaches students about the particular challenges facing an attorney assisting members of disadvantaged communities. Lectures and materials sensitize students to the unique environmental problems experienced by low income communities, features of group representation, and strategies that can effectively serve low income communities.⁴ Members of community organizations participate in selected classes.

Student attorneys spend their time on assigned projects with community groups or individuals, counseling them about environmental issues, inspecting sites with a neighborhood group, assisting community members in meetings with public officials responsible for administering environmental laws, advising members of a coalition of organizations, developing legal memoranda for public officials and community groups regarding options to solve environmental problems, facilitating participation by community members in regulatory proceedings, and consulting with environmental experts and community organizers. The supervising attorneys observe students at meetings with clients and at witness interviews; review all written documents prepared by students before they are sent out; and evaluate student practice simulations before any legal proceeding or community presentation.

In the EJP, students learn about the problems of Baltimore's low income communities and how the concerns of those communities might be voiced and addressed responsively. Clinical legal education such as the EJP affords the student the opportunity to apply knowledge gleaned from traditional classes to legal practice for disadvantaged clients. Exposure to the environmental blight in residential areas often evokes a student's sense of social responsibility. In providing a student legal skills and familiarity with environmental problems of low income neighborhoods, the EJP hopes to imbue students with commitment to public service in their legal careers.

Insights and Recommendations

In the nine months of EJP's operations, the students and faculty have observed the following:

- * Clinics can provide representation to a small number of community groups, serving those who would otherwise go without representation.

⁴ Current sources for readings on environmental justice include 29 CLEARINGHOUSE REVIEW No. 4 (Special Issue 1995); V RACE, POVERTY & THE ENVIRONMENT No. 2/3 (Fall 1994/Winter 1995).

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The representation of families with children vulnerable to lead poisoning, and of a community group next to an abandoned gas station which has emitted contamination are examples of this.

Clinic resources are slender. Additional legal resources should be devoted this work. Requests for services can be directed to the Environmental Law Section of the Maryland State Bar Association for pro bono assistance.

- * Clinics can, in their study of an issue, identify resources that are needed, and in some cases, develop them.

Baltimore City and Maryland as a whole lack a listing of environmental justice priorities. We as a community need to systematically identify and address the existing inequities.

The clinic identified a need for resources on law related to lead hazards in housing, and has developed a resource manual in draft form as a project with the Coalition for a Lead-Safe Environment.

- * Clinics may have access to testing, which is critical for low income communities to assess hazards they suspect or identify.

Universities have expertise and access to scientific resources. Clinics may help widen availability of low-fee testing.

- * Clinic students may prove to be short-term help and long-term assets to low income communities.

Law students, since they are still learning, may take longer to do effective work than a lawyer. From the perspective of a teacher, I have seen clinic students learn about low income communities, form ties, and volunteer to help with EJ issues after graduation.

- * Urban environmental justice issues call for collaboration of communities and lawyers to work together to address neighborhood problems.

Urban environmental justice issues - such as clean-up of existing housing, air, water and land, and permitting - have a direct effect on people in their homes, neighborhoods, and public areas. Unlike the earlier wave

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of environmental work in which public interest organizations could pretty effectively speak on the issues of preservation of natural resources and reduction of pollution, people must work together to address these issues effectively.

These issues are an occasion for communities, students, and professors to talk about race with goals of rectifying past wrongs and improving government's ability to make present and future decisions without racial and economic bias.

In summary, several key roles of law school clinics in serving communities on urban environmental issues are to provide a small amount of direct service, to educate and inspire students to serve communities presently and long-term, and to identify and prod development of legal information and scientific testing resources.

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October 20, 1995

**The Environmental Protection Agency and
Morgan State University Teachers Institute**

Don Koch, Baltimore City College High School

For the third year, the EPA has funded a Teachers Institute which is hosted by Morgan State University. Teachers from across the country apply and if selected, participate in this two-week program designed to --

1. Give teachers information and up-to-date knowledge on environmental issues,
2. Provide teachers with information and classroom materials especially on environmental careers,
3. Develop a network of teachers who in turn train colleagues in their school systems through faculty and in-service meetings,
4. Provide environmental education "how-to-teach" sessions and strategies, and
5. Highlight Environmental Justice Issues.

In the MSU Environmental Justice Seminar, Mr. Don Koch will explain some of the highlights of the two-week Institute and the impact it has had on his teaching, discuss his community project plan and some special projects in which his students have participated as a result of his involvement in the Institute.

Factors Affecting Land Use and Zoning in Baltimore City

Dawn McCleary, Master of City & Regional Planning (MCRP) from Morgan State University

ABSTRACT: This study examines how zoning and land use control mechanisms have impacted the existence of two communities within the Baltimore Area. The factors looked at included those that affected both Community's characters such as past and present zoning issues and decisions, types of community resources and their political representation and the effects of zoning on both community's quality of life and existence.

The history, the past and current geographic and demographic analysis, and the current zoning and land use status of both communities were studied. The findings from the analysis of these data sources support the notion that in fact, zoning decisions have significant impacts on the character and existence of the communities. This study was also able to determine how zoning related decisions have contributed positive changes on one community (predominantly white) while adversely impacting the quality of life and existence of the other (predominantly black). The research data consisted of case studies, census data, zoning ordinances and maps, historical information, as well as analysis of pertinent issues from books, magazines, and newspaper articles.

Organizing for a Sustainable, Healthy Community Environment: Three Key Policy Shifts

Presentation by Dennis Livingston

Community Resources and the Environmental Health Education Center at the UMAB
School of Medicine

OUTLINE

The implementation of a sustainable environmental program is contingent on paradigm shifts in current policy. Three crucial shifts are:

1. **From:** Reaction to environmental crises as though they were isolated problems.
 To: Development of a wholistic prevention program that understands all aspects of the environment, from wilderness issues to problems in urban centers, are inextricably related.

Example:

From: A lead abatement program that responds to children with elevated blood lead levels.

To: A community-based residential environmental assessment of all potentially hazardous conditions before they poison a child. This must include development of the local capacity to remediate the identified problems.

2. **From:** Addressing environmental problems as though they have little bearing on economic development, particularly in disadvantaged neighborhoods.
 To: Converting the environmental problems into economic development opportunities as part of sustainable environmental development plan.

Example:

From: The collection of "trash" which is often buried or incinerated in low income communities causing more environmental problems.

To: The development of neighborhood, scrap-based manufacturing industries creating profitable industries thereby developing administrative, technical and skilled jobs, and entrepreneur development within communities.

3. **From:** Creating environmental policies and programs that build community dependency on outsiders for the provision of environmental services thereby detouring potential environmental funds from the community and leaving the community incapable of addressing its own environmental problems.
 To: Using outside environmental assessment and remediation funding as seed capital to develop on-going community services and resources. The goal being a sustainable economic base.

Example:

From: The government paying millions of dollars to contractors from outside the community to clean up and board up abandoned, polluted industrial sites.

To: Capitalizing community-based companies to be equipped to convert abandoned industrial sites into thriving industrial centers. This includes training community residents in business and technical skills and establishing local favorable purchase agreements for community-based enterprises. This will result in the existence of the administrative capacity within community institutions to manage the environmental solutions within the community in a context of economic development.

There can be no economic justice without a sustainable, community-controlled economic base.

**URBAN ENVIRONMENTAL
ASSESSMENT AND
MANAGEMENT**

The Use of Environmental Justice Methods in the Environmental Impact Statement of the Aberdeen Proving Grounds

Dee Wernette

Gary Williams

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Argonne National Laboratories, Argonne, Illinois

The U.S. Environmental Protection Agency (EPA) retained Argonne National Laboratory to generate the environmental impact statement for the Aberdeen Proving Grounds in Harford County in the Baltimore metropolitan area. The EIS team incorporated environmental justice principles in the methodology of the EIS using demographic, socioeconomic, institutional, and survey research strategies in the EIS. These strategies were conducted both on an immediate (Aberdeen, Harford County) and metropolitan-wide basis. The objective of this paper is to share these methods with the audience, including both the strengths and weaknesses of the EJ component.

Drs. Dee Wernette and Gary Williams are senior scientists at Argonne National Labs Illinois and Washington, DC offices. Lenneal Henderson is a Special Term Analyst at Argonne and Professor in the School of Public Affairs at the University of Baltimore.

Baltimore Urban Environmental Initiative

Reginald Harris, Dominique Lueckenhoff, Jeff Burke, Don Torres, Reuben Dagold, Peter Conrad, Peg Ross, Wallace Baker, Frederick W. Kutz

The Baltimore Urban Environmental Risk Initiative is an interagency activity being conducted by Region III in cooperation with the City of Baltimore and the Maryland Department of the Environment. The initiative was designed to identify and rank areas of disproportionate risk in the City for purposes of implementing risk reduction, pollution prevention, public awareness and other activities to effectively eliminate, or at least minimize these risks. The initiative consists of two tracks: one, a "Short-Term Track" addressing issues of immediate concern and initial data collection and analyses; and two, a "Long-Term Track" addressing issues from the Short-Term which call for continued research and actions.

The Short-Term Track activities applied knowledge and experience of an Interagency (City of Baltimore, MDE, EPA) team to jointly target areas of environmental concern: 1) Lead, 2) Hazardous Materials Incidents, 3) Fish Consumption/Toxins in the Harbor, 4) Air Toxins, 5) Ground-Level Ozone, and 6) Indoor Air and Radon. The Long-Term Track is designed to: 1) follow up on long-term projects/actions identified by program participants in the Short-Term Track, 2) identify future environmental monitoring needs for purposes of collecting appropriate data, 3) utilize public focus groups to identify perceptions and feedback based upon findings and 4) use feedback to target long-term actions for risk reduction and environmental improvement.

Funding has been provided by EPA Region III for activities related to the following "Short-Term Track" areas of concern: 1) Lead, 2) Hazardous Materials Incidents, 3) Fish Consumption/Toxins in the Harbor, 4) Ground-Level Ozone, and 5) Indoor Air Quality. The Interagency Steering Committee hopes to achieve environmental improvements, increase public awareness, and realize positive changes related to risk reduction and pollution prevention in Baltimore.

Chester, PA Environmental Justice Urban Initiative

Reginald Harris, Patrick Anderson, Jennifer Hubbard, Dawn Ioven, Roy Smith, Joel Hersch, Jeff Burke, Nancy Rios-Jaffola, Tom Casey, Elizabeth Quinn, Debora Forman, Youngmoo Kim

The City of Chester, PA is known for having the highest concentration of industrial facilities in the state, including two oil refineries, a large infectious medical waste facility, among a number of waste processing plants in the proximity, not to mention that at least 85% of raw sewage and associated sludge is treated there. Residents have not only been concerned with the health effects of living and working amid toxic substances, but residents have actually complained of frequent illness. The fact that Chester has the highest infant mortality rate coupled with the lowest birth rate in the state, the highest death rate due to malignant tumors, the highest percentage of African-Americans of any municipality in the state, and that Chester is considered the poorest community in Delaware County raised concern for the health and well-being of the community. Appropriated issues of environmental justice and community protection have been raised.

The Chester Risk Assessment Project was part of an initiative by the United States Environmental Protection Agency (USEPA) Region III and agencies of the Commonwealth of Pennsylvania to study environmental risks, health, and regulatory issues in the Chester, Pennsylvania area. Although the intent of the study was to provide a complete "cumulative risk study", utilizing exposure data for all environmental media and exposure pathways, the actual report is more of an Aggregated Risk study due to the largely unknown nature of the interrelated exposures.

The City of Chester is located approximately 15 miles southwest of Philadelphia along the Delaware River. Surrounding communities also examined in the development of this report include Eddystone, Trainer, Marcus Hook, and Linwood.

Chemical data were gathered from existing sources, but the scope of this project did not include collection of new data specifically designed for a Chester risk assessment. Instead the workgroup performed an examination of available data which yielded the following observations:

- The data had been collected for different programs and different agencies. These data were not originally designed to support a quantitative risk assessment of the Chester Area.
- The databases were of varying quality, and certain chemicals and media had not been tested. However, even with the limited data, many data sets were available to be used to generate estimated risks.

Modeling of air data from point sources was performed prior to the air risk assessment. Therefore, point source air risks are based on projected data rather than actually collected in the field. The lead (Pb) data, area sources of volatile organic compound (VOC) emissions, Resource Conservation and Recovery Act (RCRA) site information, and Toxic

Release Inventory (TRI) data did not involve the types of environmental data conducive to quantitative risk assessment.

The findings of the report are:

- Blood lead in Chester children is unacceptably high (over 60% of children's blood samples are above the Center for Disease Control (CDC) recommended maximum level of 10ug/dl.
- Both cancer and non-cancer risks from the pollution sources at locations in the city of Chester exceed levels which EPA believes are acceptable. Air emissions from facilities in and around Chester provide a large component of the cancer and non-cancer risk to the citizens of Chester.
- The health risk from eating contaminated fish from streams in Chester and the Delaware River is unacceptably high.
- Drinking water in Chester is typical of supplies in other cities throughout the country. Slight long term (20 year) risks may be expected due to the residuals of water treatment processes.

THE PHILADELPHIA EXPERIENCE: ENVIRONMENTAL HEALTH CHARACTERIZATION IN A COMPLEX URBAN ENVIRONMENT

Ms. Nadia Shalauta, Johns Hopkins University, School of Hygiene and Public Health, Baltimore, MD; TA Burke, Johns Hopkins University, Baltimore, MD; L. Rosenberg; L. Mangiaracina; Frederick W. Kutz, Ph.D., ORD Regional Scientist, EPA Region III

Despite a tremendous progress in environmental quality in the past two decades, there remains a critical need to develop more responsive approaches to address public concerns about health and the environment. Current approaches to health risk assessment have been helpful in guiding regulatory activities, but have limited application in the evaluation of complex multi-media exposures. In addition, the technical nature and inherent uncertainty of the risk assessment process have undermined public confidence and made it difficult to translate results into meaningful applications for community health. Meanwhile, fundamental questions concerning environmental exposures and the health status of communities have remained unanswered.

The objective of this study is to develop a framework for characterizing the environmental health needs of communities within EPA Region III. The pilot project is currently in progress in the South and Southwest Philadelphia area, a complex urban environment with hundreds of sources of environmental contamination. The assessment will profile sources of population exposure and examine indicators of community health. The project seeks to identify susceptible populations and provide a foundation for the evaluation of environmental justice issues. In addition to characterizing the environmental pollution in the study, the project will focus on addressing environmental health issues of crucial interest to the public. The result of this effort will be a report which will list, in order of priority, the environmental health issues in the South and Southwest Philadelphia area. The final report will be structured to be a tool for public education as well as a building block for the establishment of a long-term strategy for continual evaluation and protection of the South and Southwest Philadelphia environment. Action recommendations to address risks will be developed. Ultimately, the methodology developed in this project will provide Region III with improved capacity to respond to community concerns about their health and environment.

The approach represents the convergence of traditional quantitative risk assessment and public health assessment methodologies. The integrative approach allows us to move beyond the traditional pollutant and media-specific approaches toward a population-based approach to community health which provides the opportunity to enhance the role of public values in the decision-making process.

BUILDING TRUST IN COMMUNITY ENVIRONMENTAL HEALTH RESEARCH

Nadia Shalauta, Thomas A Burke, Johns Hopkins University, School of Hygiene and Public Health, L. banks, R. Bialek, M. Farfel, L. Rosenberg, L. Mangiaracina

Since the first Earth Day, environmental health research has made tremendous strides in identifying and evaluating sources of environmental contamination, eliciting the toxicity of compounds, and developing complex technological solutions for clean-up of the hazards. However, the progress that has been made has often neglected to include the affected communities in the decision-making process. The environmental regulatory community has recognized the critical role of stakeholders and has begun to support approaches with strong community input.

The success of any public health effort requires the understanding and incorporation of community values. This presentation will focus on practical issues and lessons learned from the South and Southwest Philadelphia environmental characterization study.

To foster community support, it is critical to build trust and establish credibility. From the opening discussions about a project, the process must be transparent and flexible. In our environmental characterization study of South and Southwest Philadelphia, we have identified several issues that must be addressed and steps that must be taken to solicit community input and participation in environmental health research. Steps that are critical include the following:

- Identify the actors;
- Identify the concern;
- Establish a community advisory committee;
- Establish communications strategy;
- Include the community in the research design;
- Respond to community questions and,
- Include the community in the analysis and presentation of results.

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III/OFFICE OF POLLUTION PREVENTION AND TOXICS
ENVIRONMENTAL JUSTICE COMMUNITY EMPOWERMENT PROJECT**

Hank Topper, USEPA Office of Pollution Prevention and Toxics, USEPA, Reginald Harris, USEPA Region III, et al.

The Office of Pollution Prevention and Toxics (OPPT) has recently formed a workgroup to begin a focused effort to learn how to more effectively address the concerns of the environmental justice movement and communities. The workgroup is working along with EPA Region III to develop relationships with state and local governments to conduct a pilot partnership project to help a community assess and address its environmental concerns. Currently, OPPT s working with its other governmental partners in exploring the possibility of conducting the pilot study in Baltimore City. The project will unite residents, businesses and government to address environmental issues from the perspective of the neighborhood. OPPT Expects the first hand experience of the pilot to provide real insight into the needs of Communities, the State and the Region. In addition to the pilot project, the workgroup will also consult with as many regional, state and local staff as possible to learn how OPPT can more effectively assist their ongoing and future environmental justice initiatives.

SYMPOSIUM AGENDA

**Baltimore Symposium on Urban Environmental
Justice Research and Education**

Agenda

**Saturday
October 21, 1995**

8:00-9:00 a.m. Registration

9:00-10:00 Welcome and Opening Plenary - Meeting Room One

- (1) Opening Remarks - W. Wallace Baker
Director, Office of Fair Practices, Maryland Department of the Environment
- (2) Welcoming Statements
 - Dr. Cecil Payton, Executive Assistant to the President, Morgan State University
 - Mr. Stanley L. Laskowski, Deputy Regional Administrator, EPA Region III
 - The Honorable Jane Nishida, Secretary of the Environment, State of Maryland
 - Mr. Charles C. Graves III, Director of Planning, City of Baltimore
- (3) Informational Presentation
 - Dr. Clarice E. Gaylord, Director, EPA Office of Environmental Justice

10:00 - 10:15 Break
The Chemical Industry Council has sponsored coffee and juice, which will be available in the Poster Session Room

10:15 - 12:00 p.m. Outdoor Pollution - Meeting Room One
Moderator - Mr. W. Wallace Baker
Director, Office of Fair Practices, Maryland Department of the Environment

- *Employee Commute Options: Differential Gains and Losses*
Dr. Gordon Scott Bonham, Center for Suburban and Regional Studies, Towson State University; Dr. Andrew Farkas, Center for Transportation Studies, Morgan State University
- *The Ozone Pollution Map: A Technology-Based Approach to Improved Public Awareness of the Nature of Ground-Level Ozone Pollution and to a Greater Acceptance of Effective Control Measures*
Mr. Glen Besa, Ms. Rebecca Bascom and Mr. Dwight D. Wilson, American Lung Association of Maryland, Inc., Cumberland, MD

- *Contaminant Levels in Baltimore Harbor Fish and Crabs*
Ms. Mary Jo Garreis, Environmental Program Manager
Environmental Risk Assessment Program, Maryland Department of
the Environment, Baltimore, MD
- *Concentrations and Sources of Contaminants in Baltimore Air*
Dr. John M. Ondoy, Department of Chemistry, University of
Maryland, College Park, MD
- *Toxic Chemicals in Baltimore Harbor*
Ms. Jacqueline Savitz, Environmental Scientist, Chesapeake Bay
Foundation, Annapolis, MD
- *Methods to Biologically Monitor Health and Effects of Environmental
Contamination In Aquatic Organisms*
Dr. Andrew S. Kane, Aquatic Pathobiology Center, University of
Maryland School of Medicine, Department of Pathology,
Baltimore, MD
- Panel Discussion

12:00 - 1:30

Lunch/Poster Session - Poster Session Room

1:30 - 3:00

Household Hazards - Lead - Meeting Room One

Moderator - Mr. John A. Rosenthal

Director for Environmental Justice, National Office of the NAACP

- *Investigations In Environmental Equity: Young Adults And Lead
Exposure In A Community Setting*
Dr. P. Barry Ryan, Harvard School of Public Health, Boston, MA
- *Phase I Field Investigations For The National Human Exposure
Assessment Survey (NHEXAS): The Relationship Between Short-Term
Measurements And Long-Term Exposures*
Dr. P. Barry Ryan, Harvard School of Public Health, Boston, MA
- *Community Education on Lead Paint Hazards: Reaching Those Who Can
Prevent Lead Poisoning*
Ms. Ruth Ann Norton, Coalition for a Lead Safe Environment,
Baltimore, MD
- *The Issue of Lead Poisoning in the Community: Facing a Treatable
Problem*
Ms. Nicole S. Kelly, Sojourner-Douglass College Students for
Environmental Equity, Sojourner-Douglass College,
Baltimore, MD
- *Childhood Lead Poisoning: A National Overview of a Local Problem*
Mr. Max Weintraub, National Lead Information Center of the
Environmental Health Center, Washington, DC
Presented by: Ms. Deborah C. Cohen, Program Manager, National
Safety Council

- *Baltimore Urban Environmental Initiatives Program Lead Poisoning Prevention Project*
Ms. Ruth Quinn, Program Administrator, Baltimore Urban Environmental Initiatives Program, Lead Poisoning Prevention Project, Baltimore City Health Department, Baltimore, MD
- *Promotion of Environmental Justice Through the Radon Education Program by Increasing Awareness, Testing and Mitigation in the African-American Community*
Ms. Gearline C. Bryan, Program Director for Radon Education and Second Hand Smoke Awareness, National Medical Association, Washington, DC
- *Helping Children with Asthma Breathe Easy: Partnerships in Community-Based Environmental Health Education*
Ms. Marie O'Neal EPA Office of Radiation and Indoor Air
Washington, DC
Presented by Ms. Tracy Washington Enger
- *Household Pesticide Use*
Ms. Morning Sunday-Hettleman, Co-Director, Institute for Environmental Justice
- Panel Discussion

2:45 - 3:00

Break

3:00 - 4:30

Sustainable Community Development

Meeting Room One

Moderator - Dr. Gustav Jackson

Director of Environmental Studies, Sojourner-Douglass College

- *Measuring the Success of the Brownfields Economic Redevelopment Initiative*
Ms. Joi Ross, PRC Environmental Management, Inc.,
Mr. Arthur Glazer, PRC Environmental Management, Inc.,
Washington, DC
- *Urban Environmental Justice: The Role of Law School Clinics in Aiding Baltimore's Communities*
Ms. Jane Schukoske, University of Baltimore School of Law Civil Clinic, Environmental Justice Project, Baltimore, MD
Presented By: Ms. Denise Duval, Professor, Baltimore University School of Law Civil Clinic, Environmental Justice Project, Baltimore, MD
- *Morgan State University - Environmental Protection Agency Summer Institute*
Mr. Don Koch, Baltimore City College High School, Baltimore, MD

- *Factors Affecting Land Use and Zoning In Baltimore City*
Ms. Dawn McCleary, Master of City and Regional Planning from Morgan State University, Baltimore, MD
- *Organizing for a Sustainable, Healthy Community Environment: Three Key Policy Shifts*
Mr. Dennis Livingston, Director, Community Resources, University of Baltimore School of Medicine, Baltimore, MD
- *Fairfield Ecological Industrial Park*
Ms. Michele Whelley, Executive Vice President, Real Estate Development, Baltimore Development Corporation, Baltimore, MD
- Panel Discussion

4:45 - 5:00

Announcements

5:00 - 6:30

Reception

Sponsored by Sojourner-Douglass College, the African-American Environmentalist Association and the Center for Environment, Commerce and Energy

Sunday

October 22, 1995

12:30 - 2:45 p.m.

Urban Environmental Assessment and Management

Moderator - Mr. Reginald Harris
USEPA Region III

- *The Use of Environmental Justice in Environmental Impact Statements*
Dr. Lenneal Henderson, Dr. Gary Williams, Argonne National Laboratories, Argonne, IL
Presented By: Dr. Gary Williams, Argonne National Laboratories
- *Baltimore Urban Environmental Initiative*
Mr. Reginald Harris, USEPA Region III
- *Chester, Pennsylvania Environmental Justice Urban Initiative*
Mr. Reginald Harris, USEPA Region III
- *The Philadelphia Experience: Environmental Health Characterization in a Complex Urban Environment*
Ms. Nadia Shalauta, Johns Hopkins University, School of Hygiene and Public Health, Baltimore, MD
- *Building Trust in Community Environmental Health Research*
Ms. Nadia Shalauta, Dr. Thomas A Burke, Johns Hopkins University, School of Hygiene and Public Health, Baltimore, MD

- *United States Environmental Protection Agency Region III/Office of Pollution Prevention and Toxics Environmental Justice Community Empowerment Project*
Mr. Hank Topper, USEPA Office of Pollution Prevention and Toxics
- Panel Discussion

2:45 - 3:00

Break

3:00-4:00

Closing Panel Discussion: Opportunities For The Future
Moderator - Dr. Barbara Sattler
University of Maryland at Baltimore School of Medicine,
Environmental Health Education Center, Baltimore, MD

- Dr. Gustav Jackson, Director of Environmental Studies, Sojourner-Douglass College, Baltimore, MD
- Mr. Norris McDonald, President, African American Environmentalist Association, Washington, DC
- Dr Barbara Sattler, University of Maryland at Baltimore School of Medicine, Environmental Health Education Center, Baltimore, MD
- Ms. Morning-Sunday Hettleman, Co-Director, Institute for Environmental Justice
- Dr. Charles Salters, Professor of Biology, Morgan State University
- Mr. Brian Martin, President, Chemical Industry Council of Maryland
- Mr. Frederick W. Kutz, EPA Region III

4:00-5:00

Poster Session/Opportunities for Involvement and Networking

SYMPOSIUM PARTICIPANTS

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Justice Research and Education**

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