

US EPA ARCHIVE DOCUMENT

# 1 INTRODUCTION

Over the past few decades, blood lead levels in children have declined dramatically. However, lead poisoning remains a serious environmental health threat for children today. The legacy of lead-based paint and leaded gasoline will be with us for many years to come. Without further action, large numbers of young children, particularly in older, urban neighborhoods, will continue to be exposed to lead in amounts that could impair their ability to learn and to reach their full potential.

Recent efforts at the state and federal levels to reduce childhood lead poisoning have focused primarily on controlling hazards from lead-based paint. This focus is likely to continue. In February 2000, the President's Task Force on Environmental Health Risks and Safety Risks to Children released a federal, interagency strategy for eliminating childhood lead poisoning. The strategy calls for the control of lead paint hazards in 2.3 million homes where children under age 6 live (you can access the strategy at <http://www.epa.gov/children/whatwe/leadhaz.pdf>). To support the Task Force's recommendations, the federal budget for 2001 includes a 50-percent increase in lead paint hazard control grants issued by the U.S. Department of Housing and Urban Development (HUD).

While considerable attention has been given to lead-paint hazards in homes, less attention has been paid to lead-contaminated soil that surrounds these homes. Generally, this has been because of the more significant contribution to lead poisoning in children made by deteriorated lead paint and leaded dust on the interiors of homes. However, evidence exists that soil can be a source of exposure. As lead poisoning rates decline and average childhood blood lead levels decline, lead exposure from soil may be a more significant portion of the exposure for children. Therefore, it warrants attention.

This EMPACT technology transfer handbook is designed with two main goals in mind. The first goal is to present a case study showing how one community-based program—the EMPACT Lead-Safe Yard Project (LSYP) in Boston, Massachusetts—is using a variety of low-cost techniques to reduce children's exposure to elevated levels of lead in residential soil. The second—and perhaps more important—goal is to provide you with step-by-step guidance for developing a similar program to address the problem of lead in soil in your own community. The guidance in the handbook is based on the experience of the EMPACT LSYP, as well as that of several other programs. These other programs are highlighted at points throughout the handbook.

The handbook is written primarily for community organizers, non-profit groups, local government officials, tribal officials, and other decision-makers who will implement, or are considering implementing, lead-safe yard programs. At the same time, much of the information will be useful to individual homeowners interested in finding low-cost ways to reduce children's exposure to lead in soil. Before attempting to implement the techniques described in this handbook, however, homeowners need to be aware of the hazards associated with working with lead-contaminated soil. All homeowners should carefully read those passages of the handbook that describe soil-lead hazards,



Lead poisoning remains a serious environmental health threat for children today.

safety guidelines for working with lead-contaminated soil, and federal and state regulations governing acceptable work practices (in particular, see Sections 3.1, 3.3, 6.2, 6.4, and 7.6).

### **1.1 ABOUT THE EMPACT PROGRAM**

This handbook was developed by the U.S. Environmental Protection Agency's (EPA's) EMPACT Program (<http://www.epa.gov/empact>). EPA created EMPACT (Environmental Monitoring for Public Access and Community Tracking) in 1997, at President Clinton's direction. It is now one of the programs within EPA's Office of Environmental Information. EMPACT is a new approach to providing timely environmental information to communities across the nation, helping people make informed, day-to-day decisions. By the year 2001, residents in 86 of the largest metropolitan areas in the United States will have an easy way to answer questions such as:

- What is the ozone level in my city this morning?
- What is the water quality at my beach today?
- How high is the ultraviolet radiation in my city today?
- What is the level of contamination at the hazardous waste site in my community?
- What are the levels of lead in the soil in yards in my neighborhood?

To help make EMPACT more effective, EPA is partnering with the National Oceanic and Atmospheric Administration, the U.S. Geological Survey, the U.S. Department of Interior, and the National Partnership for Reinventing Government. EPA will work closely with these federal entities to help achieve nationwide consistency in measuring environmental data, managing information, and delivering that information to the public.

To date, environmental information projects have been initiated in 84 of the 86 EMPACT-designated metropolitan areas. These projects cover a wide range of environmental issues, such as groundwater contamination, ocean pollution, smog, ultraviolet radiation, and ecosystem quality. Some of these projects have been initiated directly by EPA. Others have been launched by the EMPACT communities themselves. Local governments from any of the 86 EMPACT metropolitan areas are eligible to apply for EPA-funded Metro Grants to develop their own EMPACT projects.

Communities selected for Metro grants are responsible for building their own time-relevant environmental monitoring and information delivery systems. To find out how to apply for a Metro grant, visit the EMPACT Web site at <http://www.epa.gov/empact/apply.htm>.

### **1.2 ABOUT THE EMPACT LEAD-SAFE YARD PROJECT**

During the winter of 1998, EPA's EMPACT program funded "A Community-Based Lead Assessment and Educational Pilot Project," also known as the Lead-Safe Yard Project (<http://www.epa.gov/region01/leadsafe>). The project is a joint effort between EMPACT, EPA's New England Regional Laboratory, and several community partners. The three primary objectives of the project are:

- 1) To generate real-time data of lead concentrations in residential yard soils using innovative field-portable x-ray fluorescence (XRF) technology, and to communicate these data to residents for the purpose of informing them of the health risks of lead in soil.



- 2) To plan and implement low-cost and sustainable landscape measures in residents’ yards that would reduce children’s risk of exposure to contaminated soil and that residents would be taught to maintain.
- 3) To develop a template that other communities and public agencies can use to address the issue of lead in residential soil.

The initial target community selected for the pilot project was a several-block area in the Bowdoin Street neighborhood, consisting of approximately 150 mostly older, wood-framed houses in the North Dorchester section of Boston. This is an inner-city community, with a large minority and immigrant population. Bowdoin Street is situated in the “lead belt” of Boston, where the majority of children in the city with elevated blood levels reside.

During the pilot phases, the project’s community partners in the Boston area were Boston University School of Public Health, the Bowdoin Street Community Health Center, and two non-profit landscaping companies, Dorchester Gardenlands Preserve and Garden Futures. The project team identified five tasks to be carried out by the partners:

- Outreach and education, led by the Health Center.
- Safety training, conducted by staff from the Health Center.
- Sampling and analysis, led by the EPA Regional Laboratory with assistance from a certified industrial hygienist from the Health Center.

- Soil mitigation, performed by the landscaping companies.
- Creation of a template for community action, led by Boston University School of Public Health with assistance from all partners.

The pilot project was funded in two phases, which took place in the summers of 1998 and 1999. During these two years, the project addressed 42 residences in the target area, at no cost to the homeowners; conducted a number of seminars on lead-safe yard work; and developed a “Tool Kit” for use by other communities (the materials in the Tool Kit have been incorporated into this handbook).

The third phase of the project, launched in June 2000, is targeting a different community: the Dudley Street neighborhood, which is also located in the “lead belt” of Boston. The partners in this phase include Boston University School of Public Health, the Dudley Street Neighborhood Initiative (a local planning and organizing agency), and several commercial landscapers. The objective of this phase is to use refined landscape measures and an improved educational approach in treating yards of homes that meet requirements for structural lead abatement of interior and exterior paint, or that have already been lead abated and are lead safe. As of September 2000, 18 homeowners had enrolled to have their yards tested for elevated soil-lead levels, and testing had been completed at most of the properties. The project’s goal is to complete soil testing and implement landscape treatments at 20 or more properties by the end of the year.

#### **1.2.1 RELATED LEAD-SAFE YARD PROGRAMS**

A key objective of the EMPACT LSYP is to disseminate a template of materials and methods to public agencies whose mission is to prevent childhood lead poisoning. The ultimate goal is to institutionalize soil remediation as part of a comprehensive lead poisoning prevention program in high-risk neighborhoods.

Based on the success of the pilot phase of the EMPACT LSYP, the City of Boston has already initiated two “spinoff” soil-lead programs, using the EMPACT project’s template:

- Lead Safe Boston, an office within the Boston Department of Neighborhood Development that assists homeowners financially and technically in home de-leading, is spearheading a HUD-funded lead-safe yard project that will target as many as 25 residential properties by the end of 2000. This demonstration project is meant to show how local government agencies can integrate soil-lead mitigation into ongoing home de-leading work. As of September 2000, Lead Safe Boston had enrolled 20 properties for soil-lead testing and yard treatments, and had completed treatments at nearly half of the properties. Lead Safe Boston has also done extensive work to revise materials in the EMPACT LSYP’s template (such as permission forms and contractor agreements) to meet the more rigorous legal standards required of a city agency. Many of the materials developed by Lead Safe Boston appear as samples in this handbook.
- The Office of Environmental Health, part of the Boston Public Health Commission (BPHC), initiated another spinoff lead-safe yard project in 2000 to address nine residential properties in an area of North Dorchester. These nine residences have previously undergone structural abatement of lead paint and are slated for yard intervention utilizing the EMPACT LSYP’s template. BPHC is leading the outreach effort and funding the landscaping work. EPA’s New England Regional Laboratory is providing testing support, and Lead Safe Boston is assisting with contract services.

## EMPACT LEAD-SAFE YARD PROJECT RECOGNIZED FOR EXCELLENCE

Because of the EMPACT LSYP's innovative approaches and far-reaching impacts, project partners have received several prestigious awards for their work. These include:

- 1999 Regional Science Award. The EPA Region 1 Science Council selected for this award Rob Maxfield and Paul Carroll, both from EPA's Office of Environmental Measurement and Evaluation, for their work on the EMPACT LSYP. The award noted that these scientists "demonstrated environmental leadership and utilized innovative yet simple solutions to this age old problem while gaining acceptance at the local, municipal, and national levels." The two also received EPA Bronze Medals for this work.
- 1999 Harvard Award for Excellence in Children's Health. LSYP project partner Bowdoin Street Health Center received this award for its work with the EMPACT LSYP. This annual award, cosponsored by the Harvard Center for Children's Health at the School of Public Health, the City of Boston, and Children's Hospital, recognizes a Boston organization for extraordinary work in the area of child and adolescent health.
- 2000 Boston University School of Public Health Award for Excellence in Public Health Practice. Patricia Hynes, Professor of Public Health, was recognized during National Public Health Week 2000 for her work with the EMPACT LSYP. Boston University School of Public Health selected this as one of three examples of excellence in public health research and intervention work being done by the school's faculty.

### 1.2.2 LEAD-SAFE YARD RESEARCH STUDY

EPA New England and the National Center for Lead Safe Housing (<http://www.lead-safehousing.org>) are leading a HUD-funded research study to document the effectiveness of the low-cost interim soil control measures used by the EMPACT LSYP. Other partners in the study include the Boston Department of Neighborhood Development and Boston University. This research study will include a retrospective evaluation of the soil intervention work conducted during the first two phases of the EMPACT LSYP (1998 and 1999). It also will examine data collected during the summer of 2000 by all three Boston-based lead-safe yard projects: the EMPACT project, the Lead Safe Boston demonstration project, and the BPHC project (data will be collected before, during, and after each yard intervention). The principal objective of the study is the preparation of a technical paper that will document the effectiveness of low-cost interim soil control measures in reducing risk to residents and to make this data available to HUD for policy development. The research study will also seek to answer several technical questions about the suitability of field-portable XRF technology for soil-lead testing.

### 1.3 ABOUT THIS HANDBOOK

A number of cities have expressed interest in beginning lead-safe yard programs, but they are limited by available resources. The Technology Transfer and Support Division of the EPA Office of Research and Development's (ORD's) National Risk Management Laboratory initiated the development of this handbook to help interested communities learn more about the EMPACT LSYP and to provide them with the technical information they need to develop their own programs. ORD, working with the LSYP from Region 1, produced the handbook to leverage EMPACT's investment in the project and minimize the resources needed to implement it in new cities.

Both print and CD-ROM versions of the handbook are available for direct online ordering from ORD's Technology Transfer Web site at <http://www.epa.gov/ttbnrml>. A PDF version of the handbook can also be downloaded from the EMPACT LSYP Web site at <http://www.epa.gov/region01/leadsafe>. This Web site is in turn hyperlinked to the main EMPACT Program Web site

(<http://www.epa.gov/empact>) and the ORD Technology Transfer Web site. In addition, you can obtain a copy of the handbook by contacting the EMPACT Program office at:

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Office of Environmental Information  
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We hope that you find the handbook worthwhile, informative, and easy to use. We welcome your comments; you can send them by e-mail from EMPACT's Web site at <http://www.epa.gov/empact/comment.htm>.

#### 1.4 ACKNOWLEDGMENTS

EPA and the EMPACT LSYP would like to recognize the following people and organizations for their substantial contributions to the contents of this handbook:

- Sandra Duran, a construction specialist with the Boston Department of Neighborhood Development in the City of Boston's Public Facilities Department, for creating many of the forms used during the third phase of the EMPACT LSYP and creating the specifications for construction contracting.
- The EPA New England Lead Program in the Office of Ecosystem Protection, for assistance in reviewing early drafts of the handbook.
- The New England Lead Coordinating Committee (NELCC), funded by EPA New England and the State Lead Programs, and the participants of the Lead in Soils Design Charrette, whose early work developing landscape treatments for lead-contaminated soil provided a foundation for the EMPACT LSYP's low-cost mitigation approach.
- The EPA New England Urban Environment Initiative, whose outreach and capacity-building efforts established many of the community and city partnerships that made this project possible.

#### 1.5 FOR MORE INFORMATION

Try the following resources for more on the issues and programs this handbook discusses:

The EMPACT Program  
<http://www.epa.gov/empact>

The EMPACT Lead-Safe Yard Project  
<http://www.epa.gov/region01/leadsafe>

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The Dudley Street Neighborhood Initiative  
<http://www.dsni.org>

The National Center for Lead Safe Housing  
<http://www.leadshousing.org>

Hynes, H. P., R. Maxfield, P. Carroll, and R. Hillger. "Dorchester Lead-Safe Yard Project: A Pilot Program to Demonstrate Low-Cost, On-Site Techniques to Reduce Exposure to Lead-Contaminated Soil." *Journal of Urban Health: Bulletin of the New York Academy of Medicine*. Volume 78, No. 1, March 2001.