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ENVIRONMENTAL HEALTH PROJECT

ACTIVITY REPORT

No. 13

**SUMMARY OF ACTIVITIES
IN ZLATNA, ROMANIA, 1994-1995**

- *Lead Exposure in Young Children*
- *Air Quality Monitoring and Control*
- *Occupational Health and Safety*

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Zlatna, Romania Team Member Descriptions

Patricia Billig was the overall Team Leader for the activities in Zlatna. She initiated the baseline blood level survey, developed the blood lead reduction program and provided overall coordination for the three intervention areas. Ms. Billig is an environmental toxicologist with Camp Dresser & McKee in the area of public health and ecological risk assessment and a recognized expert in the area of metal toxicity at mining sites.

Liviu Ionescu was the EHP Local Coordinator in Romania. Mr. Ionescu was the liaison between the local collaborators and the EHP team and facilitated the travel and working visits to Zlatna. Mr. Ionescu is a graduate of the Mechanical Engineering Faculty of the Polytechnical Institute in Bucharest and the coordinator for the EHP and WEC projects in Romania.

Kirsten Senturia conducted the market research analysis for a social marketing campaign to reduce the blood levels in children. She is a Ph.D. candidate at UCLA in Medical Anthropology and was an instructor for "Rapid Assessment Procedures for Health Promotion Planning in Romania" and "Rapid Assessment Procedures for Community Assessment." She also has field experience as an investigator of health issues in Albania.

Richard Pollard, a mass media specialist, analyzed data collected by Kirsten Senturia and designed a public health social marketing campaign for the lead reduction program. Mr. Pollard is a social marketing consultant to the World Bank, USAID, and British ODA. His area of expertise is in the application of marketing management to the planning, execution, and evaluation of social development programs.

Barbara Popovich, a health education specialist, worked with Richard Pollard to insure that the contents of the social marketing messages were accurate and based on successful experiences in similar copper smelting towns with lead poisoning problems. Mrs. Popovich is a Clinical Education Coordinator for Childhood Lead Poisoning Prevention in the Butte, Montana health department.

Richard Chappell, an environmental health specialist, conducted a physical exposure assessment for lead. Mr. Chappell is a geochemist with CDM; his expertise is in the area of geochemical modeling of the migration of hazardous materials in the water/soil environment. He has designed, implemented, and supervised sampling programs for physical assessments of hazardous materials in the environment.

Bart Eklund, an air pollution specialist, worked with the local Environmental Protection Agency to develop an effective air quality monitoring program. Mr. Eklund is a chemist and Senior Project Manager for the RADIANT Corporation. His work focuses on the measurement, modeling, and control of air emissions from fugitive area sources; his expertise lies in the areas of air pathway assessments, air monitoring, methods development, and air emissions from remediation activities.

Jan Matousek, an environmental engineer, worked with plant management to modify industrial process and increase controls of air pollution emissions. Mr. Matousek is a Senior Metallurgical Engineer with Kilborn International, Inc., responsible for providing technical consulting services to plant managers.

Martin Silberschmidt, an occupational health specialist, collaborated with the Ampellum plant management and personnel to develop a worker health and safety program. Mr. Silberschmidt is a medical doctor with extensive experience in environmental/occupational health throughout Eastern Europe and the Newly Independent States. Most recently, he has worked on occupational health and safety programs in the Baltic nations for WHO.

Dennis Murphy, a Senior Staff Scientist with RADIANT Corporation, was responsible for coordination of all industrial hygiene and safety services. He worked on training and monitoring aspects of occupational safety including training in the use of industrial hygiene monitoring equipment.

Cynthia Backlund, a Staff Scientist with RADIANT Corporation and industrial hygiene and environmental health specialist, assisted in the design and facilitation of the worker health and safety training course.

Cindy Becnel, an occupational health and industrial hygiene specialist, assisted with the design and facilitation of the worker health and safety training course.

John Borrazzo is a Johns Hopkins University Health and Child Survival Fellow working in the Environmental Health Division of the USAID Office of Health and Nutrition, Bureau for Global Programs. Since 1992, he has worked with USAID to define new programs in the areas of air pollution, risk assessment, and hazardous materials exposure. Among USAID-assisted countries, these issues are of particular significance in Central and Eastern Europe, as well as the former Soviet Union. In Zlatna, Dr. Borrazzo participated in the initial scoping visits to define the air monitoring and control activities.

Alan Hurwitz is a consultant in strategic planning and organizational/institutional development. He has worked on many environmental and training activities, with a focus on bringing together different actors to improve the results of their collective actions. Dr. Hurwitz works with large private corporations, local and national governments, and nonprofit organizations. He has worked on international development and other projects in more than 30 countries, including almost every country in Latin America and many countries in Africa, Europe, the Caribbean, and Asia.

ACRONYMS AND ABBREVIATIONS

CMR	Center for Medical Research (Cluj, Romania)
EAP	Environmental Action Program
EDTA	ethylene-diaminetetraacetic acid
EHP	Environmental Health Project
EPA	Environmental Protection Agency (local Romanian agency)
$\mu\text{g}/\text{dL}$	micrograms per deciliter
NGO	nongovernmental organization
OHS	occupational health and safety
SO_2	sulfur dioxide
USAID	U.S. Agency for International Development
WEC	World Environment Center

EXECUTIVE SUMMARY

Background

The Environmental Health Project was asked in June 1994 to conduct a one-year technical assistance activity in Zlatna, Romania, as part of USAID's efforts to improve environmental conditions there. In Zlatna, the principal source of nonagricultural employment, the copper smelter and refinery operations of Ampellum S.A., is also the main source of atmospheric pollution.

At the request of the Government of Romania, USAID selected Zlatna and the Ampellum S.A. copper smelter as a demonstration site for the Environmental Action Program (EAP) adopted in Lucerne by USAID and the Government of Romania in April 1993. USAID's Office of Environment and Natural Resources in the Bureau for Europe and the Newly Independent States requested EHP to provide the Ampellum copper smelter and various community groups in Zlatna with both technical and equipment assistance, with the objective of achieving short-term improvements at the plant and in the surrounding community to reduce the environmental and human health problems associated with the smelter. Based on an initial report produced by the World Environment Center (WEC) at the request of USAID, EHP addressed the following three areas of concern in Zlatna and the surrounding county (judet) of Alba:

- Reducing the exposure of young children to lead
- Air quality monitoring and control
- Occupational health and safety

Initial Objectives

The following initial objectives remained consistent throughout the one-year activity:

- Address immediate human health issues in the short-term, while long-term efforts to reduce emissions from the Ampellum plant are initiated.
- Assist in developing a reliable ambient air quality database for use in public health education and evaluating improvements at the Ampellum plant.
- Ensure sustainability of short-term activities.
- Assist in reducing the conflict between maintaining employment and protecting human health and the environment during a period of social and economic transition.

Types of Assistance

For each of the three areas of concern—reducing the exposure of young children to lead, air quality monitoring and control, and occupational health and safety—the following types of assistance were provided:

- Equipment (more than \$300,000 worth, equal to approximately half the project budget)
- Technical assistance/training
- Interinstitutional team development
- Support for Romanian institutions and the Zlatna community in implementing programs developed under this activity

Summary of Activity Year

Three working groups were established to develop the leadership and direction necessary to address environmental health issues pertinent to each of the areas of concern. Each working group included six to eight representatives from several of the following institutional stakeholders: the smelter, the Zlatna hospital, the Alba Judet Environmental Protection Agency, the Alba Judet Sanitary

Police, the Center for Medical Research in Cluj, and the Zlatna kindergarten (a list of the working group members appears in Attachment 2).

Following is a brief summary of the major steps in the activity that occurred during the year:

June 1994

- WEC report (WEC 1994) used as basis for identifying the three EHP activity areas of concern.
- Meetings with identified stakeholders to evaluate proposed activities and identify equipment needs.
- Realization of the need for an institutional assessment to identify key Romanian counterparts and potential institutional constraints.

October 1994–June 1995

- Interinstitutional working groups established for each activity (as described at the beginning of this section).
- Working groups reevaluate health issues of concern, goals, activities, and equipment needs for each activity component.
- Knowledge, attitudes, and practices survey and associated training focused on exposure of young children (1-6 years) to environmental lead.
- Identification, procurement, and delivery of more than \$300,000 worth of equipment; associated training. Included were equipment to collect and analyze blood samples from children; equipment to monitor ambient air quality and stack emissions at the Ampellum plant; respirators for workers in hazardous areas and workplace monitoring equipment.
- Support for locally designed family and community-wide health education and counseling program with accompanying educational materials aimed at reducing the exposure of young children to lead.

- Identification and assessment of potential opportunities for investment and emission reduction at the Ampellum plant.
- Training conducted in air quality monitoring and modeling for Alba EPA staff, Ampellum staff, the Ministry of Environment air quality specialist from Bucharest, a representative from the Prefect's office in Alba, and industry and EPA representatives from another county.
- Occupational health and safety training course conducted for workers at the Ampellum plant.
- Initiation of community effort to create "safe play areas."
- Approximately 500 children tested for blood lead levels as of June 1995. Results revealed very high levels of blood lead, indicative of lead poisoning.
- In June 1995, the EHP Zlatna activity team leader concluded the one-year activity by asking key Romanian participants and each working group to:
 - Evaluate the one-year EHP activity
 - Outline an action plan for the next year
 - Identify local and external resources needed to implement the action plan

Process Components

A participatory process was implemented throughout the program, beginning with the initial meetings in June 1994 and continuing through the program evaluation and future action plan development in June 1995. Over time, the participants came to trust what was occurring and the openness and sincerity of USAID's efforts. Many ideas were exchanged, individually and at group meetings; expectations were stated and elicited; deals and agreements were made regarding implementation of the action plans; and a tremendous amount of momentum was created from the energy invested by all participants. Although the offer of equipment was certainly

the motivator, it became apparent to all participants that developing intergroup communication and strengthening the capacity of local institutions and community systems to address environmental health problems would be important products of USAID's efforts.

Most of the participants at the planning and working group sessions were quite well acquainted, many on a personal basis going back a number of years. It was clear that some of the topics covered were familiar and had been the subjects of many conversations. It was also clear, however, that the type of collaborative process utilized throughout the program was new. With some support, it should continue in the future as a model for collaborative problem-solving for environmental health issues. **Thus, USAID's material aid, in addition to its immediate positive effects, can be a lever for strengthening the institutional and community systems in ways that people want, but that they have not had the experience or skills to do on their own in the past.**

Sustainability Factors

As of June 1995, several factors had emerged that could contribute to program sustainability:

- Clear demonstration by working group participants of an increased knowledge and understanding of environmental health issues and concerns.
- Establishment of a new institutional capacity to conduct social marketing activities and apply new knowledge and data to resolve environmental health issues in the community.
- Increased levels of participation and desire for technical assistance by all parties.
- Desire by participants for follow-up to consolidate gains and disseminate lessons learned to other Romanian communities.

- Introduction of interagency/public approach to addressing environmental health issues.

Romanian Participant Evaluations

Romanian participant ratings for overall activity value ranged from 8 to 10 (10 = highest rating), with many elements of each activity component identified as very valuable, especially the development of a team approach to solving environmental health problems. Ratings for whether the program will result in real increased awareness and change also ranged mostly from 8 to 10, with a few lower ratings attributed to the difficulties the Romanian participants perceive in changing their institutions. These perceived difficulties, combined with their personal commitment to change, is driving the Romanians' request for another year of technical and institutional support to consolidate the changes begun this year.

A one-half day session on the EHP Zlatna activity was included in the Sixth Annual Symposium on Environmental and Occupational Health during Societal Transition in Central and Eastern Europe, held in Eforie Nord, Romania, June 5-10, 1995. The panel of speakers consisted of Mary Ann Micka, USAID/Bucharest; Patricia Billig, EHP team leader; and several Romanian team members, including the mayor of Zlatna, who summarized his perception of the project by saying that the EHP activity was a "**lesson in democracy for Zlatna.**"

Other comments received included the following:

- "The results can be seen in the fact that people's attitudes about health risk factors have been changed."—Prefect of Alba Judet
- "Increased awareness and concern for working conditions and the tools and skills to do something about it were the most valuable parts." —Member of the Worker Health and Safety Working Group

- “Teamwork between medical, educational, and environmental professionals has been very valuable.”—Member of the Lead Working Group

Next Steps

The accomplishments to date, including the provision of equipment and technical assistance, have significantly increased the technical awareness and understanding of local medical, environmental, and educational professionals and their knowledge regarding their roles in future efforts to address the environmental health issues identified for each area of concern. Implementation of those efforts, however, including public involvement, is just beginning. The need for follow-up is clear, and is strongly desired by all participants. Next steps should include at least the following:

- A training session on environmental data analysis, interpretation, and application to addressing environmental health problems and on providing risk communication to workers and the community.
- Support for working groups, in the form of technical assistance in implementing their action plans, subscriptions to professional journals, coordination with other programs, and assistance in disseminating lessons learned and program approaches to other communities in the region with similar environmental health problems.
- Coordination and participation with other USAID environmental programs.

Lessons Learned

Scoping and implementing environmental health projects presents difficulties not commonly encountered in other types of foreign assistance projects, not the least of which is perceived versus actual links between environmental contamination and health

outcomes. The lessons learned during this activity fall into three categories: initial evaluation and problem identification, implementation, and coordination with other USAID environmental programs.

■ Initial Evaluation and Problem Identification

Initial identification and evaluation of environmental health problems in Zlatna were the result of a three- to-four day visit by a small technical team from the WEC. Because the WEC report was only given to the Ampellum plant manager, the initial EHP team spent considerable time explaining the nature and results of the report to various stakeholders, as well as seeking their concurrence regarding appropriate EHP activities and associated equipment purchases.

Because the WEC report and the initial June 1994 EHP visit focused on a technical assessment of environmental health issues in Zlatna, with relatively few and mostly higher level Romanians involved in the discussions, an associated institutional assessment was also included in the October/November 1994 activities. This institutional assessment was extremely valuable for two reasons. First, it allowed EHP team members to identify and begin to work with their actual counterparts, and second, it allowed the team to identify and acquire the necessary institutional support for efforts needed to achieve sustainability for programs under this activity.

Given USAID’s institution-building and sustainability goals, it is very clear that small, “first contact” teams, such as the initial WEC team, need to be given the direction to do an institutional assessment as well as a technical assessment. It is the institutional assessment that facilitates identification of actual in-country counterparts and identification and acquisition of the necessary in-country institutional support for USAID-sponsored activities.

■ **Implementation**

Long-term success in each of the three activities depends a great deal on a well-integrated, multidisciplinary effort that involves local health and education professionals, worker health and safety personnel in the smelter, plant management, and participants from the community (Zlatna and Alba Judet) and from the Center for Medical Research in Cluj. However, agencies and communities at the local, judet, and regional levels have had little or no experience working together to solve environmental health problems, and public involvement is not typically considered.

Three lessons are apparent regarding implementation:

□ *Need for Interinstitutional Working Groups*

Interinstitutional working groups are really models for collaborative problem-solving. The identification of in-country working counterparts (in addition to higher level officials) and the development of interinstitutional working groups for each activity have been extremely important for all phases of this activity, including problem identification, training and information needs assessment, program implementation, and program evolution and sustainability.

□ *The Need to Empower Individuals*

In-country counterparts, especially "natural" leaders, need special attention to develop a range of problem-solving skills. Despite the fact that most of the team's counterparts are highly knowledgeable and very well educated, their feeling of powerlessness to change anything is quite evident. Areas to address include identification of stakeholders, communications skills, meeting facilitation, and action plan development and implementation.

□ *Communication Needs*

Frequent written communications with and acknowledgment of local officials and working groups during the entire length of the activity have contributed significantly to its success; unfortunately, this aspect of the activity was not included in the budget and has required considerable extra time (and expense). Similar efforts in the future need to consider host-country participant communication needs at all levels. For example, although the team has had only limited interaction with the working group members' supervisors, keeping these supervisors well-informed is essential to maintaining each group member's ability to participate fully in the program.

■ **Coordination with Other USAID Environmental Programs**

There is currently an opportunity for several existing USAID programs to contribute to integrated, practical solutions to the environmental health problems in Zlatna. These programs include the U.S.

Environmental Protection Agency (soil lead clean up), Environmental Training Program (detailed action plan development and coordination with other communities), and the EHP environmental health curriculum development activity in Cluj (Romanian Continuing Medical Education course in lead intoxication, health effects, and treatment). The success of such an integrated effort, however, will require that each program provide the coordination and communications management necessary for the seamless and efficient integration of diverse program components. Attachment 8 provides a table summarizing the proposed supplemental environmental health activities and coordination framework for the Zlatna/Alba Judet region.

1 BACKGROUND

In early 1993, the Government of Romania requested the assistance of USAID to improve environmental conditions in the vicinity of the town of Zlatna, where the principal source of nonagricultural employment, the copper smelter and refinery operations of Ampellum S.A., is also the main source of atmospheric pollution. USAID responded with an initial visit by the World Environment Center (WEC) in March 1993. The following October, a four-person WEC team of experts conducted an assessment of the environmental and workplace conditions at the Ampellum copper smelter and nearby copper mines and an assessment of the potential human health risks associated with the smelter operations. These assessments identified the following environmental, human health, and workplace safety problems (WEC 1994):

- Evidence that air, surface water, and soil in Zlatna are contaminated by emissions from the copper smelter, with arsenic, lead, and SO₂ posing the greatest health risks. The most likely health effects are respiratory problems and lead poisoning.
- Preliminary and limited data indicating that children in Zlatna, compared to other children in Alba Judet (County), are experiencing significant adverse health effects that are likely a result of exposure to lead, including:
 - Reduced growth rate (25% smaller)
 - Higher blood pressure (15 mm higher)
 - Higher prevalence of musculoskeletal problems (30% higher)
 - High blood lead levels (20-65 µg/dL)

- Preliminary and limited data indicating that the general population in Zlatna, compared to the general population in other parts of Alba Judet, is experiencing significant adverse health effects that are likely a result of exposure to SO₂, including:
 - Higher prevalence of tuberculosis (50% higher)
 - Higher prevalence of upper respiratory tract disease, both acute (49% higher) and chronic (41% higher)
 - Higher rates of bronchial asthma (103% higher)
- Significant occurrences of lead poisoning in smelter workers and extreme respiratory and eye irritation due to exposure to fugitive SO₂ emissions.
- Hazardous workplace environments in the mines and in the copper smelter. These conditions can result in toxic exposures as well as physical stress and injury.

At the request of the Government of Romania, USAID selected Zlatna and the Ampellum S.A. copper smelter as a demonstration site for the Environmental Action Program (EAP) adopted by USAID and the Government of Romania in April 1993. USAID's Office of Environment and Natural Resources in the Bureau for Europe and the Newly Independent States requested the Environmental Health Project (EHP) to provide the Ampellum copper smelter and various community groups in Zlatna with both technical and equipment assistance, with the objective of achieving short-term

improvements at the plant and in the surrounding community to reduce the environmental and human health problems associated with the smelter.

The EHP activity in Zlatna addressed three areas of concern identified in the WEC report:

- Exposure of young children to lead

- Air quality monitoring and control
- Occupational health and safety

The following chapters detail the scope of the EHP activity, its accomplishments, recommendations regarding sustainability and next steps, and lessons learned.

2 SCOPE OF ACTIVITY

2.1 Initial Assessment and Planning

EHP's involvement in USAID's Zlatna efforts began in June 1994, when two EHP staff and one USAID advisor visited officials in Bucharest, Alba Iulia, and Zlatna. (The initial scope of work can be found in Attachment 1.) The purpose of the visit was to develop recommendations for specific sustainable activities related to the three areas of concern that would produce demonstrable results, within a one-year time frame, related to reducing environmental and health problems attributable to the Ampellum S.A. copper smelter. The recommended activities also had to be agreeable to the Government of Romania, the copper smelter management and employees, and members of the community. The team's approach was threefold:

1. To solicit input from Romanian counterparts regarding the environmental health problems to be addressed and the four preliminary action plans which had been developed based on the WEC report.
2. To explore ways for the various interested parties to collaborate with each other and with USAID on implementation of any action plans.
3. Based on this input, to develop recommendations for final action plans.

Because the WEC report had not been distributed to local medical and environmental professionals or to the community, the team spent considerable time explaining the nature and results of the report as well as seeking concurrence regarding appropriate EHP

activities. Equipment was clearly the focal point of the project for the Romanians and was a major topic of discussion.

The major health concerns identified in the WEC report included high blood lead levels of children in Zlatna (20-65 $\mu\text{g}/\text{dL}$), poor health and safety conditions for workers at the copper smelter, and a need for more adequate monitoring of ambient air quality. Although other concerns were identified, such as acid mine drainage into surface water in the surrounding mining areas, the immediate health concerns in Zlatna were considered to be the most appropriate focus for the one-year EHP activity.

Because both the WEC report and the June 1994 trip focused on a technical assessment of environmental health issues in Zlatna, involving relatively few and mostly higher level Romanians in the discussions, an associated institutional assessment was included in subsequent visits in October and November 1994. The institutional assessment was extremely valuable for two reasons. First, it allowed EHP team members to identify and begin to work with their actual counterparts. Second, it allowed them to identify and acquire the institutional support for EHP activities that will be crucial in sustaining programs begun as part of this effort.

Despite later changes and additions to the list of key participants, a strategy session with the initial planning group brought together an important group of people who do not usually interact with each other on a professional level, but who will need to work together for significant changes to occur. The presence and facilitation efforts of the EHP team and the promise of USAID assistance were effective

catalysts that moved the group forward in ways that are critical to achieving long-term change in the environmental health status of the Zlatna region and to sustaining USAID's efforts.

The strategy session agenda included the following segments:

- Welcome/Introduction
- Individual Statements of Desired Outcomes
- Proposed Norms for the Discussions, e.g., balanced participation, focus on solutions, collaboration, openness to new approaches, focus on environmental health in Zlatna
- Small Group Task: Identify the three most important advantages and drawbacks for each of the three areas of concern
- Action Planning: For each area of concern, a small group was asked to list the tasks that would be required and the persons or groups who would be responsible for, or participants in, each task, and who would therefore need to be informed.

It is important to note why Albamont, a local environmental NGO, was not at this meeting. First, there is some antagonism between Ampellum and Albamont, no doubt related to some of Albamont's past activities regarding the need to reduce pollution in Zlatna. The Albamont representatives, aware of this tension, saw the need to develop good relations between Ampellum and the public health and environmental agencies as more important than Albamont's attendance at the strategy session. In order to keep them informed, however, the team held a follow-up meeting with Albamont representatives the day after the planning session and assured them that there would be a public discussion/information component for each option and that Albamont, as well as other NGOs, would be identified and included in the discussions. The EHP team encouraged Albamont to work closely with the local Environmental Protection Agency (EPA), a task made easier by the fact that some of the

Albamont representatives work for the local EPA.

Initial Objectives

The following initial objectives remained consistent throughout the one-year activity:

- Address immediate human health issues in the short-term, while long-term efforts to reduce emissions from the Ampellum plant are initiated.
- Assist in developing a reliable ambient air quality database for use in public health education and evaluating improvements at the Ampellum plant.
- Ensure sustainability of short-term activities.
- Assist in reducing the conflict between maintaining employment and protecting human health and the environment during a period of social and economic transition.

Types of Assistance

For each activity component, the following types of assistance were provided:

- Equipment (more than \$300,000 worth, equal to approximately half the project budget)
- Technical assistance/training
- Interinstitutional team development
- Support for Romanian institutions and the Zlatna community in implementing programs developed during this activity

2.2 Scope of Work for Reducing the Exposure of Young Children to Lead

Purpose

To reduce childhood exposure to lead, thereby reducing blood lead levels in children.

Potential Measurable Results

Reduction of blood lead levels in children in Zlatna and changes in knowledge, attitudes, and practices of children and their parents regarding the mechanisms and consequences of childhood exposure to lead.

Tasks

- Communication, coordination, and collaboration with Romanian counterparts at the Center for Medical Research (CMR) in Cluj, the Zlatna Hospital and Dispensary, and within the community in Zlatna.
- Oversight of the design and implementation of a childhood blood lead study in Zlatna, with associated environmental lead sampling, to provide baseline information for the development of a health education and social marketing program and to identify children at risk.
- Oversight of the development of a community-based public health education and social marketing program in Zlatna to educate both parents and children regarding the source and potential health effects of exposure to lead and to promote techniques and strategies for reducing exposure.
- Acquisition of an atomic absorption spectrophotometer with a graphite furnace for analyzing blood samples for lead.
- Acquisition and development of educational materials that support implementation of the health education and social marketing program.

2.3 Scope of Work for Air Quality Monitoring and Control

Purpose

To improve confidence in ambient air monitoring data and reduce plant emissions from the new smelter, through the use of an SO₂ process analyzer on the acid plant.

Potential Measurable Results

- Implementation of an ambient air monitoring program for SO₂ and particulate that can be used for regulatory purposes and is endorsed by both Alba Judet EPA and Ampellum plant management.
- Installation of an SO₂ process analyzer for the acid plant and implementation of a plan for reducing SO₂ emissions.
- Initiation of an ambient air monitoring recordkeeping system that is understandable by the public.

Tasks

- Communication, coordination, and collaboration with Romanian counterparts at the Alba Judet EPA and Ampellum during all phases of the program.
- Training in and oversight of the development of a regulatory ambient air monitoring program with clearly defined goals and objectives.
- Acquisition and installation of ambient air monitoring equipment to support the monitoring program.
- Acquisition and installation of an SO₂ process analyzer for the acid plant, and development of a plan for using information from the analyzer to reduce SO₂ emissions.
- Oversight of the development of an ambient air monitoring recordkeeping system for use by all interested parties.

2.4 Scope of Work for Occupational Health and Safety

Purpose

To assist plant management, the plant doctor, union representatives, and the sanitary police in improving health and safety conditions and workplace monitoring practices.

Potential Measurable Results

- Implementation of a health and safety plan for all plant workers that utilizes workplace monitoring equipment and personal protective equipment to develop and sustain both long- and short-term improvements in worker health and safety.
- Initiation of a health and safety record-keeping system that will allow formal tracking of changes in numbers or types of worker health and safety incidents and health measurements such as blood lead levels.
- A list of locations and processes where hazards to workers have been minimized by engineering controls, administrative actions, and/or use of personal protective equipment.

Tasks

- Communication, coordination, and collaboration with Romanian counterparts at the CMR in Cluj, the Alba Judet Sanitary Directorate and Police, plant management and union representatives for all phases of the program.
- Training in and oversight of the development of a practical plant health and safety plan that clearly defines the roles and responsibilities of plant management personnel, plant health and safety workers, the plant physician, and Ministry of Health officials, including Sanitary Police and the CMR in Cluj.
- Acquisition of workplace and personal monitoring equipment to support the training program and implementation of the health and safety plan.

- Oversight of plant acquisition of personal protective equipment that is readily available in Romania.
- Development and implementation of an on-site occupational health and safety training program that integrates the use of personal protective equipment, workplace monitoring equipment, and administrative actions to control hazards.
- Oversight of the development of a health and safety recordkeeping system that will allow documentation of baseline conditions, comparison of old and new smelter operations, and comparison of health outcomes to monitoring results.

2.5 General Work Plan for the Three Areas of Concern

EHP identified technical consultants for each of the three areas of concern. The consultants made three to five trips each to Zlatna during the one-year activity, to accomplish the following:

- Develop relationships with working groups.
- Assist the working groups to develop action plans.
- Provide organizational, monitoring, and technical assistance to the working groups as they implement their programs.
- Assist working groups to identify appropriate equipment and training needs.
- With EHP, develop detailed specifications and procure, ship, and install equipment.
- With EHP, design and deliver training programs.

At the end of the one-year activity, EHP asked the three working groups to evaluate the EHP effort and identify next steps.

3 ACCOMPLISHMENTS

Major accomplishments of the EHP Zlatna activity, described in detail in the progress reports from November 1994, March 1995, and June 1995 and available on request from EHP, are summarized below.

- *Interinstitutional Romanian working groups formed for each area of concern.* Attachment 2 provides a list of the members of each working group.
- *Action plans developed by each working group listing what they would like to accomplish in the following year (see Chapter 4).*
- *Monitoring and screening activities conducted for all three areas of concern using equipment supplied by EHP.* Attachment 3 provides a list of equipment supplied for each activity component.
- *Individual family and community-wide health education materials and programs developed to reduce the exposure of young children to lead.* Attachment 4 provides a copy of the educational materials in Romanian with English translations. Attachment 5 provides counseling messages to assist home visit nurses to counsel parents, as well as information for local pediatricians to consider when evaluating individual children.
- *Training courses developed on air monitoring/modeling and occupational health and safety (OHS).* Course outlines are provided in Attachments 6 and 7.
- *Community development activities initiated (i.e., community efforts to develop safe play areas for young children at the three*

kindergarten/preschools in the vicinity of the copper smelter).

- *Preliminary identification and assessment of potential opportunities for investment and emission reduction at Ampellum completed. Diagnostic stack testing conducted at various locations in the system, using equipment provided by EHP.*

3.1 Specific Activity Milestones

Specific accomplishments for the three activity components are described below.

Reducing the Exposure of Young Children to Lead

- Delivered an atomic absorption spectrophotometer with a graphite furnace and autoanalyzer to the CMR in Cluj for use in analyzing large numbers of child blood samples from Zlatna, Copsca Mica, and Baia Mare, with the low detection limit required for child blood lead evaluations. Also, included CMR in an international Lead Testing Proficiency Program sponsored by the U.S. Centers for Disease Control.
- Established a Zlatna-based Lead Working Group to coordinate blood lead sampling, health education, and clean up activities.
- Collected and analyzed approximately 200 soil and 200 house dust samples for lead, to gain a better understanding of how much these media contribute to overall lead exposure (data on the contributions of lead-contaminated vegetation, tap water, and air already exist).

- Completed a health education research (social marketing) training program; researched current knowledge, attitudes, and practices of young children and their caregivers regarding childhood lead exposure.
- Conducted a two-hour technical seminar for medical staff at the Zlatna hospital on the health effects of lead exposure in young children.
- Developed a Romanian social marketing team to design and implement a lead awareness program in Zlatna.
- Provided blood collection supplies and a hematofluorometer to the doctors in Zlatna hospital for use in evaluating lead exposure in children.
- Completed a blood lead sampling program (by CMR) for approximately 300 children.
- Presented blood lead sampling results, health education materials for associated family counseling, a community-wide health education program, and treatment options. (The Lead Working Group made the presentation at a meeting in Zlatna on May 2, 1995.)
- Advanced a community effort to create safe play areas at the three kindergarten/preschools in Zlatna and Patrengeni, with assistance from the kindergarten directors and the U.S. Peace Corps.
- Data from the blood lead component were provided to the EHP environmental health curriculum development activity in Cluj and were used to develop a Romania-based case study on childhood lead poisoning.

Air Quality Monitoring and Control

- Conducted a pollution prevention audit of the Ampellum plant and identified emission reduction opportunities.
- Conducted a three-day air quality management and air monitoring training program for local EPA staff, Ampellum staff, the Ministry of Environment air

quality specialist from Bucharest, a representative from the Prefect's office in Alba, and industry and EPA representatives from another judet.

- Developed and prioritized a more detailed air monitoring equipment list, in conjunction with the local EPA director, and stack emissions equipment specifications with the health and safety director for Ampellum.
- Established an Air Quality Monitoring Working Group to oversee development of an air quality monitoring program and to ensure that adequate program and preparatory logistical needs are in place prior to installation of air monitoring equipment. This group will review and oversee the use of air monitoring data and its communication to the public.
- Met with teachers at the Zlatna high school regarding student participation in air monitoring activities, including the potential location of an air monitoring station at the school, and received a very enthusiastic response.
- Procured and delivered ambient air monitoring equipment and stack emissions monitoring equipment in June 1995, and provided additional operations and maintenance training in conjunction with equipment delivery.
- Supplied the Zlatna High School chemistry teacher and the president of Albamont with a set of approximately 30 student experiments (requiring simple materials available in Zlatna and Alba) dealing with topics related to air pollution.
- EHP provided significant input and collaboration for the Zlatna study tour to the United States.

Occupational Health and Safety

- Established a working group on improving worker health and safety, comprising representatives from Ampellum, the Sanitary Police in Alba Iulia, medical staff

at the plant and in the Zlatna hospital, the Department of Worker Protection within the Ministry of Health, and the CMR.

- Collaborated with the working group to identify major health issues at the plant, and developed a prioritized list of equipment and training needs.
- Interviewed several workers about their knowledge, attitudes, and practices regarding health and safety issues at the plant.
- Collaborated with the working group on the design and implementation of an occupational health and safety training program, May 8-13, 1995. The scope of the training program was determined by topic needs identified by the working group. This needs assessment determined that lead intoxication and SO₂ exposure issues should be the focus of the course. Both the safety inspector and the health inspector from the Ampellum plant helped to teach the course.
- Conducted a plant tour to identify hazardous areas requiring special attention during the training program.
- Provided testing equipment to determine the sizes of respirators needed and a video illustrating the procedure to the health and safety director at Ampellum.
- Procured and delivered personal and workplace monitoring equipment and personal protective equipment to coincide with the training program.

3.2 Collaborative Planning Process

A participatory process was implemented throughout the program, beginning with the initial meetings in June 1994 and continuing through program evaluation and future action plan development in June 1995. Over time, the participants came to trust what was occurring and the openness and sincerity of USAID's efforts. Many ideas were exchanged, individually and at group meetings; expectations were stated and elicited; deals and

agreements were made regarding implementation of the action plans; and a tremendous amount of momentum was created from the energy invested by all participants. Although the offer of equipment was certainly the motivator, it became apparent to all participants that developing intergroup communication and strengthening the capacity of local institutions and community systems to address environmental health problems could be important products of USAID's efforts.

Most of the participants at the planning and working group sessions were quite well acquainted, many on a personal basis going back a number of years. It was clear that some of the topics covered were familiar and had been the subjects of many conversations. It was also clear, however, that the type of collaborative process utilized throughout the program was new. With some support, it should continue in the future as a model for collaborative problem-solving for environmental health issues. **Thus, USAID's material aid, in addition to its immediate positive effects, can be a lever for strengthening the institutional and community systems in ways that people want, but that they have not had the experience or skills to do on their own in the past.**

3.3 Romanian Participant Evaluations

Romanian participant ratings for overall activity value ranged from 8 to 10 (10 = highest rating), with many elements of each activity component identified as very valuable, especially the development of a team approach to solving environmental health problems. Ratings for whether the program will result in real increased awareness and change also ranged primarily from 8 to 10, with a few lower ratings attributed to the difficulties the Romanian participants perceive in changing their institutions. These perceived difficulties, combined with their personal commitment to

change, are driving the Romanians' request for another year of technical and institutional support to consolidate the changes begun this year.

A one-half day session on the EHP Zlatna activity was included in the Sixth Annual Symposium on Environmental and Occupational Health during Societal Transition in Central and Eastern Europe, held in Eforie Nord, Romania, June 5-10, 1995. The panel of speakers consisted of Mary Ann Micka, USAID/Bucharest; Patricia Billig, EHP team leader; and several Romanian team members, including the mayor of Zlatna, who summarized his perception of the project by

saying that the EHP activity was a "lesson in democracy for Zlatna."

Other comments received included the following:

- "The results can be seen in the fact that people's attitudes about health risk factors have been changed."—Prefect of Alba Judet
- "Increased awareness and concern for working conditions and the tools and skills to do something about it were the most valuable parts." —Member of Worker Health and Safety Working Group
- "Teamwork between medical, educational, and environmental professionals has been very valuable."—Member of Lead Working Group

4 SUSTAINABILITY AND NEXT STEPS

Long-term success in each of the three activities depends a great deal on a well-integrated, multidisciplinary effort that involves local health and education professionals, occupational health and safety personnel at the smelter, plant management, and participants from the community (Zlatna and Alba Judet) and from the Center for Medical Research in Cluj. It should be noted that at the time of the first EHP team visit to Zlatna in June 1994, none of the information from the WEC report had been disseminated to local professionals or the community, and some of the technical issues identified in the WEC report were not recognized locally. For example, the specific hazards of exposure of young children to lead were not recognized or understood by the community at large and were only recognized in a limited way by the medical community. In addition, local, judet, and regional agencies had little or no experience working together to solve environmental health problems, and public involvement was not considered.

Sustainability Factors

A number of factors that could contribute to sustainability have emerged as of June 1995. They are listed below.

- Clear demonstration by working group participants of an increased knowledge and understanding of environmental health issues and concerns.
- Establishment of a new interinstitutional capacity to conduct social marketing activities and apply new knowledge and data to resolve environmental health issues in the community.
- Increased levels of participation and desire for technical assistance by all parties.
- Desire by participants for follow-up to consolidate gains and disseminate lessons learned.
- Introduction of an interagency/public approach to addressing environmental health issues.
- Recent formation, in part due to EHP activities, of a judet-level, interagency Environmental Commission initiated by the Prefect's office, and a Zlatna Community Environmental Restoration Committee initiated by the Mayor's office.

Follow-up Efforts

These sustainability factors and the accomplishments to date, including the provision of equipment and technical assistance, have significantly increased the technical awareness and understanding of local medical, environmental, and educational professionals, and have enhanced their knowledge of their own roles in ongoing efforts to address the environmental health issues identified for each activity component. Implementation of those efforts, however, including the involvement of the public, was just beginning in May 1995. Follow-up is clearly needed and strongly desired by all participants. It should include the elements listed below.

- *A training session on environmental data analysis, interpretation, and application to address environmental health problems and to provide risk communication to workers and the community.* Each working group is

acquiring new environmental data with the equipment provided by EHP. The various approaches for evaluating and interpreting data in an environmental problem solving context are not well understood.

- *Support for working groups in the form of technical assistance in implementing their action plans, subscriptions to professional journals, coordination with other programs, and assistance in disseminating lessons learned and program approaches to other communities in the region with similar environmental health problems.* Working group participants have articulated the need for applying the lessons learned in Zlatna to the implementation of new national environmental policies, as well as to communities with similar issues, such as Copsca Mica and Baia Mare.
- *Coordination with the newly formed judet-level Environmental Commission and the Zlatna Environmental Restoration Committee.* This would start with a joint meeting of both groups in March 1996 at which the working groups would give presentations. These presentation would include a brief history of activities and equipment provided, accomplishments to date, and identification of local and regional resources needed to sustain the programs begun by EHP/USAID. An action plan would be outlined for use in the follow-up ETP Community Action Plan Training which is scheduled to occur in April 1996.
- *Coordination and participation with other USAID environmental programs.* There is currently an opportunity for several in-place USAID programs to provide various pieces of a comprehensive, integrated, practical solution to the environmental health problems in Zlatna. These include the U.S. Environmental Protection Agency (soil lead clean up), Environmental Training Program (detailed action plan development and coordination with other communities), and the EHP environmental

health curriculum development activity in Cluj (Romanian Continuing Medical Education course in lead intoxication, health effects, and treatment). The success of such an integrated effort, however, will require that each program provide coordination and communications management for an efficient integration of diverse program components. Attachment 8 provides a table summarizing the proposed supplemental environmental health activities and coordination framework for the Zlatna/Alba Judet region.

Lastly, it should be noted that the EAP investment effort recently initiated at the Ampellum copper smelter would benefit from having a well-established environmental health program in place that can document the effort's success.

Working Group Action Plans for the Next Year

Action plan development with each working group focused on the following:

- additional technical assistance and training to consolidate gains and activities introduced this year;
- maximizing the analysis, interpretation, and use of data acquired with the new equipment;
- dissemination of lessons learned to communities with similar environmental health issues; and
- requests for relatively minor amounts of additional equipment and supplies.

Attachment 9 provides a follow-up scope of work for future EHP activities in Zlatna that largely reflects the action plans outlined by each working group. A few issues specific to each working group are listed below.

1. *Reducing the Exposure of Young Children to Lead*

■ **Blood Lead Results and Further Testing**

For the first 300 children tested, mean blood lead (BPb) results for 1-6 year olds (n=123) range from 34 to 41 $\mu\text{g}/\text{dL}$, and for 7-11 year olds (n=177) from 35 to 39 $\mu\text{g}/\text{dL}$. These results indicate significant lead poisoning and a high likelihood for adverse health effects, especially neurological effects. A single high value (110 $\mu\text{g}/\text{dL}$; next highest value was 73 $\mu\text{g}/\text{dL}$) for a 6-year-old child with low risk (exposure) factors led to a retesting of 10 children with blood lead values above 60 $\mu\text{g}/\text{dL}$. Eight of the 10 retests showed values within the expected range of individual variation of children over time; however, the child with a previously reported value of 110 $\mu\text{g}/\text{dL}$ had a value of 41 $\mu\text{g}/\text{dL}$ in the retest and another child's previous value was reduced by half. These two discrepancies renewed doctors' suspicions regarding data quality and concerns regarding how to explain this large variation to parents.

The initial 110 $\mu\text{g}/\text{dL}$ value for the child that later tested at 41 $\mu\text{g}/\text{dL}$ has two possible explanations. One is that the child received an acute exposure prior to sampling. Second is the possibility of a lab technician operating or reporting error. Currently, doctors in Zlatna do not understand how and why blood lead values can vary, and the CMR in Cluj is unwilling to consider that they could have made any kind of error. This is just one example of the need for a data analysis, interpretation, and applications workshop.

■ **Health Education**

Attachment 4 provides examples of the health education brochures, coloring book, and poster developed by the Lead Working Group for Zlatna. These materials have been very well received, but more collaboration is needed between health education specialists from the Health Education Laboratory in Alba Iulia and the home visit nurses in Zlatna. Although the

Zlatna nurses have received some training in identifying lead exposure pathways, their orientation is still toward medical treatment rather than toward health education and behavior changes as the keys to reducing child blood lead levels. A significant setback for the Lead Working Group was the dissolution of the Sanitary Police's Health Education Laboratory in June 1995. As a result, the leadership for the education activities was lost. By November 1995, however, a new, interim health education laboratory director had been appointed, and it is expected that her position will be finalized in January 1996, at which time a new group of staff may be appointed.

■ **Medical Response Plan**

Attachment 5 provides counseling messages, developed in consultation with doctors in Zlatna and at the CMR, and information for doctors, provided by EHP staff. Currently, children who are selected for chelation would be treated in Cluj (approximately a two-hour drive from Zlatna) with ethylenediaminetetraacetic acid (EDTA). When chelation therapy is complete, the children would be taken to a sanitarium near Abrud (approximately a 30-45 minute drive from Zlatna in the mountains), where they could remain for six to eight weeks. Both the therapy and the stay in the sanitarium would be at no cost to the families. EHP's primary concern is to ensure that very aggressive pathway reduction techniques are implemented in the environments of these children to avoid a rebounding effect, which could put them at greater risk than they were prior to therapy.

■ **Recommended Follow-up Activities**

Follow-up activities will be coordinated by EHP staff and integrated with other USAID activities to continue support for reducing the exposure of young children to lead in Zlatna and related goals. Recommendations are to:

- Continue technical assistance and support to the Lead Working Group to

implement the health education and medical response plans developed during the first year of the EHP activity.

- Assist the Lead Working Group and medical personnel at the CMR in Cluj to analyze and interpret blood lead and environmental lead sampling data and apply results to the health education and medical response programs.
- Develop a community-based soil lead cleanup program for areas frequented by young children.
- Increase capacity of the Health Education Laboratory at the Sanitary Police in Alba Judet to produce health education materials and program implementation follow-up.
- Support the Lead Working Group with disseminating lessons learned to Copsca Mica, Baia Mare, and other communities with similar environmental lead problems.

2. *Air Quality Monitoring and Control*

■ **Agreement Between Alba EPA and Ampellum Regarding the Validity and Interpretation of Air Quality Monitoring and Stack Emissions Data**

This important task will require some facilitation by EHP staff during the coming year. The establishment of the working groups has already improved communications between the plant and Alba EPA; however, as data are collected, issues will likely arise regarding the sharing and interpretation of that data.

■ **Linking of Measured Air Data with Plant Operations and Other Environmental Measures**

Assuming that there is agreement on the validity of the data, the critical issue will be how the data are interpreted relative to regulations and plant operations. In addition, EAP efforts at the plant could greatly benefit

from this type of information, which would help with the evaluation of specific techniques for increasing plant efficiency and reducing emissions.

3. *Occupational Health and Safety*

■ **Worker Awareness and Understanding of Occupational Health and Safety Issues and Needs**

OHS staff at the plant report a high level of interest among workers in using newly introduced personal protective equipment and workplace monitoring devices. One of the working group's strongest recommendations is for a "training of trainers" program for plant OHS staff, to increase their ability to maximize the use of "safety moments" (15-20 minute sessions required at the beginning of each shift at the plant to address OHS issues; these sessions are currently devoid of substantive content). This training program would be supplemented by worker focus groups and audiovisual equipment and materials.

■ **New Perception of Health Status of Workers**

Because the regular plant doctor, Dr. Jomoleanu, has been ill, he has been temporarily replaced by a doctor from Zlatna Hospital, Dr. Vultur, who is also coordinator of the Lead Working Group. Dr. Jomoleanu has been reluctant to disclose any significant health problems among workers at the plant. Dr. Vultur, however, has informally reported to the EHP team that the health status of workers is even worse than she imagined. The team suggested that she meet with the plant's health and safety director, Mr. Filimon, who is coordinator of the Worker Health and Safety Working Group, to discuss specific work areas and types of apparent health effects. A related issue to be addressed is the lack of enforcement of existing regulations regarding pregnant workers, specifically, the requirement that they be moved to less hazardous areas during pregnancy.

Although EHP may not be able to address these issues directly, further support of the Worker Health and Safety Working Group could certainly increase the members' understanding of and capacity to deal with these issues.

■ **Interpretation of Workplace and Personal Monitoring Data**

Now that data are being collected from new workplace and personal monitoring devices, information on interpreting and using that data needs to be communicated to the appropriate individuals. One of the issues that needs to be addressed is the fact that current regulations require five-minute measurements, which provide little information regarding exposure and potential risk.

5 LESSONS LEARNED

Scoping and implementing environmental health activities present difficulties not commonly encountered in other types of foreign assistance projects, not the least of which is perceived versus actual links between environmental contamination and health outcomes. The lessons learned during this activity fall into four categories: initial evaluation and problem identification, implementation, coordination with other USAID environmental programs, and sustainability.

■ Initial Evaluation and Problem Identification

Initial evaluation and identification of environmental health problems in Zlatna were the results of a three- to-four day visit by a small technical team from the WEC. Because the WEC report was given only to the Ampellum plant manager, the initial EHP team spent considerable time explaining the nature and results of the report to various stakeholders, as well as seeking their concurrence regarding appropriate EHP activities and associated equipment purchases.

Because the WEC report and the initial June 1994 EHP visit focused on a technical assessment of environmental health issues in Zlatna, with relatively few and mostly higher-level Romanians involved in the discussions, an associated institutional assessment was also included in the October/November 1994 activities. This institutional assessment was extremely valuable for two reasons. First, it allowed EHP team members to identify and begin to work with their local counterparts, and second, it allowed the team to identify and acquire the necessary institutional support for efforts needed to achieve sustainability for programs under this activity.

Given USAID's institution-building and sustainability goals, it is very clear that small, "first contact" teams, such as the initial WEC team, need to be given the direction to do an institutional assessment as well as a technical assessment. As discussed previously, it is the institutional assessment that facilitates identification of actual in-country counterparts and identification and acquisition of the necessary in-country institutional support for USAID-sponsored activities.

■ Implementation

Three lessons are apparent regarding implementation:

□ *Need for Interinstitutional Working Groups*

Interinstitutional working groups serve as models for collaborative problem-solving. The identification of actual working in-country counterparts, in addition to higher level officials, and the development of interinstitutional working groups for each activity have been extremely important for all phases of this activity, including problem identification, training and information needs assessment, program implementation, and program evolution and sustainability.

□ *The Need to Empower Individuals*

In-country counterparts, especially "natural" leaders, need special attention to develop a range of problem-solving skills. Despite the fact that most of the team's counterparts are highly knowledgeable

and very well educated, their feeling of powerlessness to change anything is quite evident. Areas to address include identification of stakeholders, communications skills, meeting facilitation, and action plan development and implementation.

□ *Communication Needs*

Frequent written communications with and acknowledgment of local officials and working groups during the entire length of the activity have contributed significantly to its success; unfortunately, this task was not in the budget and has required considerable extra time. Similar efforts in the future need to consider host-country participant communication needs at all levels. For example, although the team has had only limited interactions with the working group participants' supervisors, keeping these supervisors well informed is essential to maintaining the group members' full participation in the program.

■ **Coordination with Other USAID Environmental Programs**

As mentioned in the previous chapter, several existing USAID programs could collaborate to provide an integrated solution to the environmental health problems in Zlatna. The success of any such collaboration will hinge on the degree of coordination and quality of communications among the key individuals in the various programs.

■ **Sustainability**

The interinstitutional working groups must outlive the life of the EHP/USAID project and the departure of the original Romanian team members for two primary reasons. First, the *environmental problems that need to be resolved* are interinstitutional/community problems that are not solely the responsibility of any one agency or community group. Second, the resources needed to sustain these programs all include recurrent costs for supplies and disposable items that, for practical reasons, should be divided between different groups.

The ultimate goal is for these programs to be valued at national or regional policy levels and reflected at the institutional level in program budgets and structures. EHP efforts towards this objective will be focused on the recently formed judet-level, interagency Environmental Commission initiated by the Prefect's office and a Zlatna Community Environmental Restoration Committee initiated by the Mayor's office.

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Attachment 1

INITIAL SCOPES OF WORK

A. Worker Health and Safety Program	25
B. Sulphur Dioxide Monitoring and Control Program	31
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ENVIRONMENTAL HEALTH PROJECT

Scope of Work

ZLATNA, ROMANIA COPPER SMELTER: WORKER HEALTH AND SAFETY PROGRAM

October 3, 1994

BACKGROUND

The Romanian government has requested the assistance of AID to improve environmental conditions in the town of Zlatna and its vicinity. Zlatna has been identified by the Government of Romania as one of the 12 environmental "hot spots" in the country. The government of Romania's concern for Zlatna and its environmental problems has, in part, been fueled by public concerns and a demand for action raised by Romanian environmental NGOs in the Zlatna vicinity. The environmental health problems affecting Zlatna result from industrial pollution caused by the operations of a state owned copper smelter plant named Ampellum.

AID's response to the Government of Romania's request began with an initial exploratory visit by the World Environment Center (WEC) in March 1993 followed by a one week assessment by a four person WEC team in October 1993. The assessment team found the environmental conditions severe and adversely affecting the health of the workers, their families and local residents.

The environmental problems identified in Zlatna resulting from the operations of the Ampellum copper smelter plant include air pollution, soil contamination, water contamination, crop contamination. In addition, it was determined that the Ampellum plant workplace environment posed significant physical and chemical hazards to workers. The contaminants identified as most harmful to the Zlatna environment and likely to be responsible for health problems are arsenic, lead, and sulfur dioxide. The population groups whose health is most at risk were identified as the 1500 workers at the plant and the worker's families (especially their children). In addition, Zlatna's entire 8,000 population is at risk and the down-wind communities may also be affected to some degree.

The most significant health risks identified were respiratory cancer (from the arsenic and sulfur dioxide); impaired respiratory functions and acute respiratory disease (from airborne dust and sulfur dioxide); impaired intelligence, growth and behavioral problems in children (from lead) and; injury and disease (from the workplace).

AID/ENI/ENR in support of the Environmental Action Program (EAP) requested that the Environmental Health Project (EHP) follow-up on the work of the WEC in providing assistance to Zlatna. The EAP was developed and adopted in Lucern in April 1993 in response to a call by environmental Ministers from both the east and west. The EAP acknowledges that there are still a number of severe environmental situations which require immediate and urgent action despite the efforts already undertaken by Central and Eastern European (CEE) countries to tackle environmental problems. The EAP establishes a partnership between Eastern and Western countries. CEE countries would undertake essential policy and institutional reforms, while Western governments and international financial institutions would provide technical assistance to support these reforms, and contribute toward the implementation of priority projects.

At the request of the Romanian government, AID has selected Zlatna and the Ampellum copper smelter plant as a demonstration site for the Environmental Action Program. As part of this effort,

AID/ENI/ENR requested that the EHP provide the Ampellum Copper Smelter and the community of Zlatna with both technical and commodities assistance with the objective of making improvements in health and in the environment. The time frame for the EHP assistance is approximately 18 months beginning in May 1994.

An initial EHP activity was carried out in July 1994 (Activity 018-RC). In this activity, an EHP team traveled to Zlatna to consult with the private and public stakeholders regarding the findings of the WEC assessment and reached consensus as to what are the priority environmental and health problems and what intervention by USAID/EHP would be most effective and wanted. In addition, the EHP team developed a coordinated plan of action with the relevant Romanian counterpart institutions for the implementation of the agreed upon interventions. The plan included a commitment of human and financial resources by the Romanian institutions to carry out certain activities with technical and equipment assistance from the EHP. The major activity areas agreed upon included:

- setting up a supplementary sulphur dioxide monitoring and control program,
- setting up a worker health and safety program inside the plant,
- designing and helping to implement a public health campaign aimed at reducing blood lead levels of children in Zlatna.

With continued support from AID/ENI/ENR, the EHP will implement three separate but parallel year-long activities for each of the above listed activity areas. This scope of work describes a series of activities related to setting up a worker health and safety program.

Purpose

The purpose of this activity is to assist plant management, the plant doctor, union representatives, and the Sanitary Police in improving worker health and safety conditions and work place monitoring practices.

Activities

1. Communicate, coordinate and collaborate with Romanian counterparts at the Institute for Hygiene and Public Health in Cluj, the Alba County Sanitary Directorate and Police, plant management, and union representatives for all phases of the program.
2. Provide technical assistance and information for plant management to develop a practical plant health and safety plan which clearly defines the roles and responsibilities of plant management personnel, plant health and safety workers, the plant doctor, and Ministry of Health officials including the Sanitary Police and the Institute in Cluj.
3. Identify, procure and ship personal and work place monitoring equipment which will support the training program and implementation of the health and safety plan.
4. Make recommendations for plant acquisition of personal protective equipment that is readily available in Romania.
5. Develop and implement an on-site 2 week, health and safety personnel training program which integrates the use of personal protective equipment, work place monitoring equipment, and administrative actions to control hazards.

6. Provide technical assistance in the development of a health and safety record keeping system that will allow documentation of baseline conditions, comparison of old and new smelter operations, and comparison of health outcomes to monitoring results.
7. At the end of this activity, write a report describing the work carried out and final outcomes. This report will in turn be incorporated into an EHP Activity Report that combines the reports of the three major intervention areas of lead, air monitoring and worker health. The preparation of the Activity report will be coordinated by the Zlatna technical team leader

Outcomes

1. Development and implementation of a plant-wide Health and Safety Program Plan for workers and Plant processes which utilizes work place monitoring equipment to quantify potential hazards and to develop and sustain both long and short-term improvements in worker health and safety.
2. A description of locations and processes where hazards to workers have been reduced by engineering controls, administrative actions and/or use of personal protective equipment.
3. Initiation of a health and safety record keeping system which will allow formal tracking of changes in numbers or types of worker health and safety incidents and in addition, health measurements such as blood lead levels.

Schedule

Fall '94	Winter '94-'95	Spring '95
Collaboration with Romanian counterparts regarding equipment and implementation of an initial plant health and safety program.	Review and comment on Romanian H&S Program Plan development.	H&S Training. (one week)
H&S program development assistance.	Translate equipment instructions.	IH Equipment Training (one week) including collection of baseline IH data.
Complete equipment specifications and procurement.	Prepare health and safety (H&S) and industrial hygiene (IH) equipment training program.	Review and finalize plant H&S Program Plan and record keeping system.

PERSONNEL AND LEVEL OF EFFORT

PERSON	ACTIVITY TO BE PERFORMED							Total Days
	Project Planning	Coordination w/Rumanians	Develop/ Present H&S Course	Procure Equip.	Develop/ Present IH Course	Project Mgmt	Report Prep.	
Karen Ramsey <i>Program Planner</i>	2					3		5
M.Silberschmidt <i>Occupational Health Spec.</i>	2	10	2		1			15
K. Senturia <i>Market Analyst</i>	2	5	3					10
Pat Billig <i>Environmental Health Spec.</i>	2					5		7
Dennis Murphy <i>Occupational Health Spec.</i>	5	5	5	2	15	2	2	36
Mark Rothney <i>Occupational Health Spec.</i>	1		13	7	30		2	53
D. Sandfordt <i>Occupational Health Spec.</i>					25		1	26
Rich Pollard <i>Mass Media</i>	2	5	5		5		3	20
Liviu Ionescu <i>Program Planner</i>	15	5	3		10	5	2	40
Sue Fisher <i>admin. procurement</i>				5				5
Jeri Blackwell <i>secretary training mat.</i>			5		7		3	15
Barb Zarlingo <i>editor trng materials</i>			2		3		2	7
	31	30	38	14	96	15	15	239

Equipment List

a. Noise Monitoring Equipment
Sound survey level meter and calibrator: one (1)
Noise dosimeter kit: includes four (4) dosimeters and calibrator
b. Air Sampling Equipment
Air sampling pumps (personal):
Combination high-low flow: ten (10)
High Volume Area Sampling Pump: one (1)
Battery Charger, 5 Station: two (2)
Primary Calibration: one (1)
Expendables
Air Sampling Supplies: (includes filter cassettes and filters, charcoal tubes, passive dosimeters for VOCs and Sulfur Dioxide, impingers, cyclones, etc.
Rotometers: two (2)
d. Real-time Analyzers (portable)
Analyzer for Multiple Gases: one (1) (analyzes for flammable gases, carbon monoxide, sulfur dioxide, hydrogen sulfide, oxygen)
Volatile Organic Vapor Monitor: one (1)
Ventilation Monitor: one (1)
e. Heat Stress Monitors
Personal Monitors: two (2)
Area Monitors: one (1)

ENVIRONMENTAL HEALTH PROJECT

Scope of Work

ZLATNA, ROMANIA COPPER SMELTER: SULPHUR DIOXIDE MONITORING AND CONTROL PROGRAM

October 3, 1994

BACKGROUND

The Romanian government has requested the assistance of AID to improve environmental conditions in the town of Zlatna and its vicinity. Zlatna has been identified by the Government of Romania as one of the 12 environmental "hot spots" in the country. The government of Romania's concern for Zlatna and its environmental problems has, in part, been fueled by public concerns and a demand for action raised by Romanian environmental NGOs in the Zlatna vicinity. The environmental health problems affecting Zlatna result from industrial pollution caused by the operations of a state owned copper smelter plant named Ampellum.

AID's response to the Government of Romania's request began with an initial exploratory visit by the World Environment Center (WEC) in March 1993 followed by a one week assessment by a four person WEC team in October 1993. The assessment team found the environmental conditions severe and adversely affecting the health of the workers, their families and local residents.

The environmental problems identified in Zlatna resulting from the operations of the Ampellum copper smelter plant include air pollution, soil contamination, water contamination, crop contamination. In addition, it was determined that the Ampellum plant workplace environment posed significant physical and chemical hazards to workers. The contaminants identified as most harmful to the Zlatna environment and likely to be responsible for health problems are arsenic, lead, and sulfur dioxide. The population groups whose health is most at risk were identified as the 1500 workers at the plant and the worker's families (especially their children). In addition, Zlatna's entire 8,000 population is at risk and the down-wind communities may also be affected to some degree.

The most significant health risks identified were respiratory cancer (from the arsenic and sulfur dioxide); impaired respiratory functions and acute respiratory disease (from airborne dust and sulfur dioxide); impaired intelligence, growth and behavioral problems in children (from lead) and; injury and disease (from the workplace).

AID/ENI/ENR in support of the Environmental Action Program (EAP) requested that the Environmental Health Project (EHP) follow-up on the work of the WEC in providing assistance to Zlatna. The EAP was developed and adopted in Lucern in April 1993 in response to a call by environmental Ministers from both the east and west. The EAP acknowledges that there are still a number of severe environmental situations which require immediate and urgent action despite the efforts already undertaken by Central and Eastern European (CEE) countries to tackle environmental problems. The EAP establishes a partnership between Eastern and Western countries. CEE countries would undertake essential policy and institutional reforms, while Western governments and international financial institutions would provide technical assistance to support these reforms, and contribute toward the implementation of priority projects.

At the request of the Romanian government, AID has selected Zlatna and the Ampellum copper smelter plant as a demonstration site for the Environmental Action Program. As part of this effort, AID/ENI/ENR requested that the EHP provide the Ampellum Copper Smelter and the community of Zlatna with both technical and commodities assistance with the objective of making improvements in

health and in the environment. The time frame for the EHP assistance is approximately 18 months beginning in May 1994.

An initial EHP activity was carried out in July 1994 (Activity 018-RC). In this activity, an EHP team traveled to Zlatna to consult with the private and public stakeholders regarding the findings of the WEC assessment and reached consensus as to what are the priority environmental and health problems and what intervention by USAID/EHP would be most effective and wanted. In addition, the EHP team developed a coordinated plan of action with the relevant Romanian counterpart institutions for the implementation of the agreed upon interventions. The plan included a commitment of human and financial resources by the Romanian institutions to carry out certain activities with technical and equipment assistance from the EHP. The major activity areas agreed upon included:

- setting up a supplementary sulphur dioxide monitoring and control program,
- setting up a worker health and safety program inside the plant,
- designing and helping to implement a public health campaign aimed at reducing blood lead levels of children in Zlatna.

With continued support from AID/ENI/ENR, the EHP will implement three separate but parallel year-long activities for each of the above listed activity areas. This scope of work describes the activity related to setting up a supplementary sulphur dioxide monitoring and control program.

Purpose

To provide training in air quality management policy and concepts and air quality monitoring practices and procedures; air quality monitoring equipment will be provided and installed to track and evaluate air quality improvements in the Zlatna area. In addition, to assist the Ampellum plant in optimizing SO₂ controls through the procurement of an SO₂ analyzer and to provide technical assistance and advice in preventing pollution through additional potential modifications to both the old and new smelters.

Activities

1. Design and implement a one-week training program in air quality management and air quality monitoring for the local EPA and other interested parties. This training will provide a foundation for the local EPA to use in developing an air quality monitoring program and provide guidance in utilizing the resulting data to develop workable and equitable air quality management strategies and goals. Training and discussion topics envisioned are:
 - Implementing Air Quality Standards - Selection of Technology vs. Risk Based Standards.
 - Emission estimation/inventory and emissions modeling for setting air quality goals and siting air quality monitors.
 - QA/QC and data management for air quality monitoring and setting staff and resource requirements for a sustainable air quality monitoring program.
2. Provide technical assistance by reviewing and commenting on the existing air quality program, provide recommendations for future roles and requirements of government and industry in setting and achieving air quality goals.
3. Provide technical assistance to the Ampellum plant management on process control and optimization for reducing air emissions. A process engineer will consult with the Ampellum smelter management and engineers to explore process control and optimization options for reducing emissions to meet evolving air quality standards, particularly in a context of maintaining the economic viability of smelter operations.
4. Procure, ship and install air quality monitoring equipment with operations/maintenance training to the local EPA (see equipment list). Develop specifications for the air quality and process monitoring

hardware including vendor delivery, installation, and training for the air quality monitoring equipment. The training to be provided with this activity is intended to be "hands-on" with emphasis on routine operation, preventive maintenance, repair, and calibration of the ambient air quality instrumentation. The items proposed for delivery under this activity are shown below.

5. Procure and ship a process SO₂ analyzer for installation and operation by Ampellum. This activity includes delivery only for the process analyzer and sampling system (installation, start-up and operations provided by Ampellum).

Outcomes

1. Increased capability of the local EPA to develop an air quality management program which includes air quality monitoring.
2. Delivery of air quality measurement and control technology to the local EPA.
3. Delivery of a process SO₂ analyzer to the Ampellum smelter.
4. Increased capability of the Ampellum plant to prevent pollution.

Schedule

Activities 1, 2 and 3 are planned for the October/November 1994 period. Bid specifications should be finalized by mid-December 1994. Expectations are that the bidding, delivery, and installation of equipment should be completed during the first quarter of 1995.

Equipment List

Qty	Description
2ea	8-Channel Data Acquisition System with Printer (including start-up supply of printer paper Note : DAS needs to have full function Front Panel for System Access & approach assumes no modem for telemetry)
2es	12-amp Uninterruptable Power Supply
2ea	Pulsed Fluorescence SO ₂ Analyzer with Internal 2-point span check and zero/span valves
2ea	TSP Samplers*
1ea	1-Year Supply of Consumables for DAS, pulsed SO ₂ analyzers and TSP Samplers
2ea	Misc. Installation Hardware (including sampling line) for installation at users supplied climate controlled building
	Installation of monitoring equipment
1ea	Process SO ₂ with sample conditioning system
1ea	Airfreight, Inland Transport, and Insurance
1ea	Duties, Taxes, Export/Import License
	TOTAL

* Gravimetric analysis of supplied filters assumes user has access to suitable 4-place weighing balance.

PERSONNEL AND LEVEL OF EFFORT

Person Days of Work per Labor Category and Task

	Labor Category	1	2	3	4	5	6	7	8	9	10	11	Total	
	Task	Boyd <i>Air Pollution Control Specialist</i>	Jenkins <i>Air Pollution Control Specialists</i>	Eklund <i>Air Pollution Control Specialists</i>	Pamley <i>Air Quality Assessors</i>	Ranum <i>Air Quality Assessors</i>	Stephens <i>Air Quality Assessor</i>	Wilkinson <i>Program Planner.</i>	Ramsey <i>Program Planner</i>	Billig <i>Env. Health Specialist</i>	Liviu <i>Program Planner</i>	Matousek <i>Env. Engineer</i>		
1	Activity startup, Preplanning, etc.	3		2	8			1					14	
2	Team Planning Mtgs.				1		1	1	1	1			5	
3	Consultation with Romanians				8		1	1				14	24	
4	Finalize Equipment Spec. and Procurement		2	1		5	7					3	18	
6	Develop and Implement Training				8								8	
7	Project Management and Support			4	8			4	2	2	2		40	
8	Report Preparation (Final)			1	1			1				3	6	
9	Report Translation										8		8	
10	On-Site Translation										15		0	
	Total Days	3	2	8	34	5	9	8	3	3	28	20	123	

ENVIRONMENTAL HEALTH PROJECT

Scope of Work

ZLATNA, ROMANIA COPPER SMELTER: REDUCTION OF BLOOD LEAD LEVELS IN CHILDREN

October 3, 1994

BACKGROUND

The Romanian government has requested the assistance of AID to improve environmental conditions in the town of Zlatna and its vicinity. Zlatna has been identified by the Government of Romania as one of the 12 environmental "hot spots" in the country. The government of Romania's concern for Zlatna and its environmental problems has, in part, been fueled by public concerns and a demand for action raised by Romanian environmental NGOs in the Zlatna vicinity. The environmental health problems affecting Zlatna result from industrial pollution caused by the operations of a state owned copper smelter plant named Ampellum.

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The environmental problems identified in Zlatna resulting from the operations of the Ampellum copper smelter plant include air pollution, soil contamination, water contamination, crop contamination. In addition, it was determined that the Ampellum plant workplace environment posed significant physical and chemical hazards to workers. The contaminants identified as most harmful to the Zlatna environment and likely to be responsible for health problems are arsenic, lead, and sulfur dioxide. The population groups whose health is most at risk were identified as the 1500 workers at the plant and the worker's families (especially their children). In addition, Zlatna's entire 8,000 population is at risk and the down-wind communities may also be affected to some degree.

The most significant health risks identified were respiratory cancer (from the arsenic and sulfur dioxide); impaired respiratory functions and acute respiratory disease (from airborne dust and sulfur dioxide); impaired intelligence, growth and behavioral problems in children (from lead) and; injury and disease (from the workplace).

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At the request of the Romanian government, AID has selected Zlatna and the Ampellum copper smelter plant as a demonstration site for the Environmental Action Program. As part of this effort,

AID/ENI/ENR requested that the EHP provide the Ampellum Copper Smelter and the community of Zlatna with both technical and commodities assistance with the objective of making improvements in health and in the environment. The time frame for the EHP assistance is approximately 18 months beginning in May 1994.

An initial EHP activity was carried out in July 1994 (Activity 018-RC). In this activity, an EHP team traveled to Zlatna to consult with the private and public stakeholders regarding the findings of the WEC assessment and reached consensus as to what are the priority environmental and health problems and what intervention by USAID/EHP would be most effective and wanted. In addition, the EHP team developed a coordinated plan of action with the relevant Romanian counterpart institutions for the implementation of the agreed upon interventions. The plan included a commitment of human and financial resources by the Romanian institutions to carry out certain activities with technical and equipment assistance from the EHP. The major activity areas agreed upon included:

- setting up a supplementary sulphur dioxide monitoring and control program,
- setting up a worker health and safety program inside the plant,
- designing and helping to implement a public health campaign aimed at reducing blood lead levels of children in Zlatna.

With continued support from AID/ENI/ENR, the EHP will implement three separate but parallel year-long activities for each of the above listed activity areas. This scope of work describes activities related to reducing blood lead levels of children in Zlatna.

Purpose

To reduce childhood exposure to lead and, therefore, reduce blood lead levels in children in Zlatna.

Activities

1. Communicate, coordinate and collaborate with Romanian counterparts at the Institute for Hygiene and Public Health in Cluj, the Zlatna Dispensary, and the community in Zlatna
2. Provide technical assistance and oversight in the design and implementation of a childhood blood lead study in Zlatna, with associated environmental lead sampling, to provide baseline information for the development of a health education and social marketing program and identify children at risk
3. Provide technical assistance and oversight in the development of a community-based, public health education and social marketing program in Zlatna to educate both parents and children regarding the source and potential health effects of exposure to lead, and associated contaminants and promote techniques and strategies for reducing exposure
4. Procure an atomic absorption spectrophotometer with a graphite furnace for blood lead analyses.
5. Identify and develop educational materials which will support implementation of the health education and social marketing program.
6. Coordinate lead activity with air quality monitoring and control activity and worker health and safety activity as needed.
7. At the end of this activity, write a report describing the work carried out and final outcomes. This report will in turn be incorporated into an EHP Activity Report that combines the reports of the three major interventions areas of lead, air monitoring and worker health. The preparation of the Activity report will be coordinated by the Zlatna technical team leader.

Outcomes

1. Reduction of blood lead levels in children in Zlatna
2. Changes in knowledge, attitudes and behaviors of children and their parents regarding the mechanisms and consequences of childhood exposure to lead.
3. An EHP activity report

Schedule

Fall '94	Winter '94-'95	Spring '95
<p>Collaboration with Romanian counterparts regarding the design and implementation of a baseline blood lead and environmental lead investigation. September</p>	<p>Review and analysis of baseline blood lead and environmental lead data. Oversight of record keeping system to evaluate the effectiveness of subsequent public health interventions.</p>	<p>Implementation of social marketing campaign to change knowledge, attitudes and practices of parents, teachers, and children in order to reduce childhood exposure to lead.</p>
<p>Implementation of a baseline child blood lead and environmental lead investigation. October 18 -29 Zlatna</p>	<p>Review and analysis of social marketing research results.</p>	<p>Oversight of follow-up blood lead investigations in October '95 and beyond.</p>
<p>Implementation of social marketing research, including training of Romanian counterparts, regarding knowledge, attitudes and practices of parents/teachers regarding the mechanisms and consequences of childhood exposure to lead. October 10-29 Zlatna</p>	<p>Development, in collaboration with Romanian counterparts, of social marketing campaign to reduce blood lead levels in children in Zlatna. Production of education and marketing campaign materials in Alba Iulia or Bucharest.</p>	<p>Assessment of changes in knowledge, attitudes and practices of children, parents and teachers.</p>

Equipment List

- Atomic Absorption Spectrophotometer with a graphite furnace and associated equipment and supplies
- Portable XRF unit (on 3 week loan) for measuring lead in environmental samples
- Environmental health educational materials and supplies

PERSONNEL AND LEVEL OF EFFORT

Person Days of Work per Labor Category and Activity

Labor Category	1	2	3	4	4	5	6	7	8	9	10	Days/ Task
Task	Ramsey Program Planner	Spink Program Planner	Billig Env. Health Spec.	Favin Health Ed. Spec.	Chappell Env. Health Spec.	Alai Program Planner	Ionescu Program Planner	Senturia Market Specialist	Pollard Mass Media	Popovich Health Ed. Specialist	Smith Program Planner	
1 Activity startup, SOW	3										3	6
2 Team Planning Mtgs.	2	3	4	1				2	2		2	16
3 Coordination with Romanian counterparts			5				10					15
4 Design/implement child baseline blood Pb survey			10									10
5 Design/implement env. baseline Pb survey			5		20		10					35
6 Design/implement public hlth/soc mkt campaign			5	5			30	20	30	20		110
7 Admin. support	5		5								10	20
8 Procure/ship AA unit						4	3					7
9 Monthly status and final reports			10									10
Days/Person	10	3	44	6	20	4	53	22	32	20	15	229

Attachment 2

LIST OF WORKING GROUP MEMBERS

		Activity	
	Air Monitoring & Control	Worker Health & Safety	Reduction of Lead Exposure
Primary Contact	Mr. Clepan/Alba EPA	Mr. Filimon/Ampellum	Dr. Vultur/Zlatna Hosp.
Key Participants	Mr. Filimon/Ampellum	Mr. Treger/Ampellum	Dr. Vintila/Zlatna Hosp.
	Mr. Pocanschi/Alba Judet	Dr. Jomoleanu/Plant Dr.	Dr. Bumbea/Alba SP
	Mrs. Adler/Min. of Env.	Dr. Teisan/Zlatna Hosp.	Mrs. Puiulet/Zlatna Kind.
	Mrs. Stoica/Alba EPA	Mr. Muresan/Safety Insp.	Mrs. Prata/Zlatna Kind.
	Mrs. Maier/Alba EPA	Dr. Suciu/Health Insp.	Dr. Niciu/CMR, Cluj
		Dr. Perseca/CMR, Cluj	Dr. Gurzau/CMR, Cluj
			Dr. Repede/CMR, Cluj
USAID/EHP Representative	Mr. Bart Eklund	Mr. Dennis Murphy	Ms. Patricia Billig

Attachment 3

EQUIPMENT PROVIDED FOR EACH ACTIVITY

037

Atomic Absorption Unit (ATOMSPEC GF Workstation)
Cadmium, Chromium, Mercury, Zinc, Selenium, and Lead lamps
VAC NDL Multi Sample
Lavendar Sample
Hematofluorometer repair and parts

038

SO2 Analyzer
Pump pack
Fluorocarbon valves
oven tubes
Spare parts and supplies
Data loggers with key pad
Data logger for Met Station (analyzer)
Software, cartridge, reader
Flow controlled high volume sampler
Calibration kit
Pure quartz filter media
motor blower, gaskets, brushes
wind speed sensor
radiation shield, assembly, mount, cables, vane assembly, etc.
Method 5 control console system
probe
modular sampler
cable, nozzles, filters, thimble holder and fiber thimble, clean-up kit, compass
Sample manifold, met one, data cartidges, power supply, cross arms, extra supplies, parts, hardware,
rack slides, etc.
Met sensor interface board and cartridges
indoor/outdoor weather monitoring system
hazardous materials kit and so2 tubes
2 quantum designs workstations (computers, printer, and software)
chromium trioxide flakes

Dispensing Buret (250 ml)	1
Dispensing Buret (1000 ml)	2
3" 3 prong clamp	2
Castaloy Hook Connector	2
Rectangular Cast Iron Stand	2
Standard Fisher Brand Stopwatch	1
Bottle for Dry Absorbents	2
Drying tubes, 50 membranes, holders	1
Alpha-1 Battery Pack	2
Replacement Filters	10
Travel 5 Alpha-1 w/ multi-charger	1
ASB-II high volume sampler	4
Glass Smoke Tubes	4
Florescent Particles	4
UV head lamp	1
Monitor Field Kits (for SO ₂)	2
Calibration Kits	1
Spare Sensor	2
Calibration Gas	2
Comfo II face masks	50
GMCH Acid Gas HEPA Cartridge	20
Type H HEPA Cartridge	125
Aerosol Pre-Filter Covers	150
Cartridge Receptacle	20
Cradle Headband	10
Exhalation Valve	100
Exhalation Valve Cover	10
Exhalation Valve Seat	10
Type F Aerosol Pre-Filter	520
Spirometer	1
3 liter calibrator	1
Disposable Noseclips (400/box)	1
Disposable Mouthpieces (500/box)	2
Thermal Printing Paper	1
37 mm filters	2
Fundamentals of Air Sampling	1

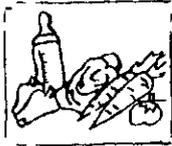
Attachment 4

EDUCATIONAL MATERIALS

A. Counseling Messages for Parents	47
(Romanian brochure and English translation)	
B. General Community Brochure	53
(Romanian brochure and English translation)	
C. Safe Play Areas Brochure	58
(Romanian brochure)	
D. Posters and Assorted Messages	60

ALIMENTAȚIA SĂNĂTOASĂ ȘI PROTECȚIA FAȚĂ DE EFECTELE CONTAMINĂRII CU PLUMB

Calciul și fierul pot contribui la apărarea organismului copiilor împotriva efectelor contaminării cu plumb. Medicii sfătuiesc pe toți cei care locuiesc în zone afectate de poluarea cu plumb, și îndeosebi pe copii, să consume cantități suplimentare de alimente bogate în calciu și fier, cum ar fi laptele și zarzavaturile cu frunzele de culoare verde închis :spanacul, măcrișul, urzicile etc.



SĂ AJUTĂM LA CURĂȚAREA SPAȚIILOR DE JOACĂ PENTRU COPIII NOȘTRI

În curând, la cele două grădinițe de copii din Zlatna se vor stabili anumite măsuri pentru ca spațiile exterioare de joacă pentru copii să fie cât mai curate, cât mai lipsite de praf și particule de pământ contaminate cu plumb. Dacă doriți să sprijiniți această acțiune, vă rugăm să



luați legătura cu educatoarea copilului dumneavoastră.

Dacă aveți acasă o grădină sau o curte în care copiii dumneavoastră obișnuiesc să se joace, sfătuiți-i și aveți grijă ca ei să se joace numai pe iarbă sau pe suprafețe tari (asfaltate, betonate), unde este mai puțin praf sau pământ. Dacă locuiți la bloc, stabiliți împreună cu vecinii dumneavoastră cum veți proceda pentru a curăța zona în care se joacă copiii.

CUM POT AFLA DACĂ LA COPILUL MEU A APĂRUT INTOXICAȚIA CU PLUMB ?

Adeseori este greu să ne dăm seama dacă un copil suferă din cauza unei posibile intoxicații cu plumb. Cel mai sigur mod de a afla acest lucru este stabilirea **concentrației de plumb în sânge**. Dacă aveți copii între 1 și 6 ani, adresați-vă dispensarului medical pentru programarea acestei analize simple. Dacă aveți copii mai mari de 6 ani și presupuneți că ar putea fi intoxicați cu plumb, prezentați-i la medic și acesta va stabili starea lor de sănătate și dacă analiza este necesară sau nu.

CE FACEM DUPĂ CE OBȚINEM REZULTATUL ANALIZELOR ?

Asistentele medicale de la dispensar vă vor da rezultatul analizelor de sânge pentru copilul dumneavoastră. Totodată, ele vă vor spune dacă, din punctul de vedere al intoxicației cu plumb, copilul este doar ușor afectat sau are probleme de sănătate mai serioase.



1. Dacă copilul dumneavoastră nu este intoxicat cu plumb

E bine! Copilul dumneavoastră este deocamdată ferit de efectele plumbului! Cu toate acestea, păstrați această broșură, urmați sfaturile cuprinse în ea și **continuați protejarea copilului împotriva prafului și pământului contaminat**. Nu putem fi niciodată absolut siguri că pericolul contaminării este complet eliminat. După cel mult un an, vă rugăm să aduceți din nou copilul la analize.

2. Dacă copilul dumneavoastră este afectat de intoxicația cu plumb

Copilul dumneavoastră a fost și este expus plumbului din praf și pământ. Pe baza celor citite în această broșură, discutați cu asistenta medicală și stabiliți care sunt modalitățile de contaminare a copilului cu plumb și apoi încercați să găsiți cele mai bune metode de a reduce la maximum această contaminare. Totodată, vă rugăm să aduceți copilul la dispensar pentru o examinare medicală, urmând să primiți recomandările corespunzătoare din partea personalului de specialitate. În continuare, aduceți copilul la dispensar în mod periodic, din 6 în 6 luni sau la intervalul de timp recomandat de medici, pentru analiza nivelului de plumb în sânge.



...

Material editat de Laboratorul Județean de Educație pentru Sănătate și Promovare a Sănătății Alba-Iulia, în colaborare cu Centrul Medical, de Servicii de Sănătate și de Conducere Cluj-Napoca, filială a Institutului de Igienă, Sănătate Publică, Servicii de Sănătate și de Conducere București. Redactat și distribuit în cadrul "Proiectului pentru Sănătatea Mediului Înconjurător și a Comunității Zlatna".
Coordonator și sponsor: "Agenția SUA pentru Dezvoltare Internațională" (USAID).



PROIECTUL PENTRU SĂNĂTATEA
MEDIULUI ÎNCONJURĂTOR
ȘI A COMUNITĂȚII ZLATNA

Dispensarul Medical Zlatna

-Pentru părinți-

**Ce putem face
pentru prevenirea
INTOXICAȚIEI CU PLUMB
la copii**

-1995-



I want to grow up healthy, too

CUM SE CONTAMINEAZĂ COPIII CU PLUMB ?

Să considerăm, de exemplu,

copilul dumneavoastră și modul în care acesta se joacă. Prin ce modalități credeți că praful și pământul, conținând compuși de plumb în particule, pot ajunge în gura copilului dumneavoastră?



...copiii duc la gură jucării murdare cu praf sau pământ.

...copiii pot scăpa alimentele pe jos, le ridică și apoi le mănâncă, fără să le curețe și fără să le spele.



...copiii se joacă în aer liber cu mingea sau cu alte jucării și apoi duc degetele la gură.

...copiii culeg, cumpără sau primesc de la rude, vecini și prieteni fructe sau legume care au pe ele praf sau pământ și pe care le consumă nespălate.



...copiilor le place foarte mult să se joace cu pământ sau cu nisip, care le pot pătrunde cu ușurință în gură.

CE ESTE POLUAREA CU PLUMB?

Solul și praful contaminat cu plumb se găsesc peste tot în jurul nostru. De peste 200 de ani, în Zlatna se dezvoltă industria de prelucrare a metalelor neferoase și, în tot acest timp, prin procesul de poluare, compușii de plumb și alte substanțe toxice s-au acumulat în întreaga zonă a localității.

În prezent se fac eforturi pentru a se reduce cantitatea de plumb care poluează zilnic orașul, prin instalarea unor filtre noi la furnalul uzinei "Ampellum". Totuși, prin aceasta nu se va reduce cantitatea de plumb care este deja acumulată în sol și în praful din jurul nostru.

Contaminarea cu plumb este mai periculoasă pentru copiii mici, deoarece ei sunt mai puțin atenți decât copiii mai mari sau decât adulții și pot înghiți mai frecvent praf sau pământ. În acest mod, plumbul din praf și pământ pătrunde în corpul copiilor și le afectează sănătatea.

Pătrunderea plumbului în organismul copiilor nu duce în toate cazurile la probleme foarte grave de sănătate și nu toți copiii sunt afectați în mod egal. Totuși, dacă nu suntem suficient de atenți și nu protejăm copiii de praful și pământul contaminat, intoxicația cu plumb le poate afecta dezvoltarea sistemului nervos, cauzându-le dificultăți la învățătură, le poate încetini creșterea și le poate provoca slăbirea auzului.

Ce ați putea face pentru ca toate aceste evenimente nedorite să nu se întâmple iar copilul dumneavoastră să fie protejat atât în casă cât și în afara ei ?

CE PUTEM FACE PENTRU A NE PROTEJA COPIII DE CONTAMINAREA CU PLUMB?

Desigur, cu toții dorim să avem copii curați și sănătoși. Dar oare facem destul pentru a fi siguri că ei nu se contaminează cu plumb și că sănătatea lor nu este în pericol?

Iată câteva lucruri pe care le puteți face:



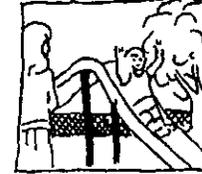
...păstrați-vă locuința cât mai curată și mai lipsită de praf. Puteți ocroti mai bine sănătatea copiilor dumneavoastră dacă măturați în casă cu o mătură umedă și dacă ștergeți praful cu o cârpă umedă, în loc să folosiți aspiratorul. Asigurați-vă ca locurile de joacă ale copiilor să fie cât mai lipsite de praf.

...asigurați-vă ca jucăriile copiilor să fie curate și lipsite de praf.



...asigurați-vă ca niciodată copilul dumneavoastră să nu mănânce alimente sau dulciuri căzute pe jos, atât în casă cât și afară.

...supravegheați copilul când se joacă pe afară și asigurați-vă ca mâinile sale să fie curate, fără praf sau pământ. Dacă nu este posibil să supravegheați copilul tot timpul, învățați-l să nu ducă degetele la gură înainte de a se spăla pe mâini.



...spălați întotdeauna mâinile copiilor dumneavoastră și învățați-i să se spele singuri pe mâini ori de câte ori aceștia vin de afară, de la joacă, precum și înaintea fiecărei mese.



...tăiați unghiile copilului dumneavoastră în mod periodic, cel puțin odată pe săptămână.

...asigurați-vă ca fructele și legumele consumate de copilul dumneavoastră să fie întotdeauna bine curățate și spălate, prin frecare în apă curgătoare. Învățați copiii să mănânce fructele și legumele pe care le culeg ei înșiși sau pe cele cumpărate sau primite de la alții (vecini, prieteni, rude) numai după ce au fost spălate cu grijă.



...puteți proceda și așa: dacă vedeți orice copil în Zlatna jucându-se în praf sau cu pământ, atrageți-i atenția să înceteze jocul și sfătuiți-l să meargă să se spele pe mâini.

ZLATNA ENVIRONMENTAL HEALTH PROJECT

COUNSELLING LEAFLET

LEAD POLLUTION

YOU AND YOUR CHILD - WHAT YOU CAN DO

Lead polluted dust and soil is all around us. The copper smelting plant has been in operation in Zlatna for over 200 years, and one of the results of this has been the deposits of lead that have fallen on our town over all this time.

Steps are now being taken to reduce the amount of lead pollution that falls on our town through the installation of new equipment in the smelter, but this will not reduce the amount of lead accumulated in the dust and soil around us.

The effects of lead pollution are more serious in young children because they are not as careful as older children to keep the dust and soil containing lead out of their mouths. This is the main way that the lead in the dust and soil gets into their bodies and can cause health problems.

Lead poisoning is not always serious, and some children are affected by it more than others, but if we are not careful to protect our children from dust and soil, lead poisoning can lead to learning difficulties (because lead affects the brain's development), to reduced growth, and hearing loss.

HOW CHILDREN ARE AFFECTED BY LEAD POLLUTION

Let us consider your child and your child's play behavior. Which of these ways do you think your child might get lead poisoned dust and soil into their mouths ?

(child sucking a toy)

Children suck toys with dust or soil on them

(child picking up dropped banana)

Children drop food on the ground, pick it up and eat it without cleaning it

(child catching ball)

Children play with balls or toys outside and then suck their fingers or hands

(child picks apple from tree)

Children pick - or are given - fresh fruits or vegetables which have dust or soil on them

(child building sand castle; another child with blow pipe)

Children love to play with soil or sand and it is easy for them to transfer these into their mouths

Are you helping your child avoid these ways to get lead into their bodies both inside and outside

the home ?

WHAT YOU CAN DO TO PROTECT YOUR CHILD ?

Of course we are all doing what we can to keep our children clean and healthy. But are we doing enough to make sure our children are not exposed to the dangers of lead poisoning? These are some of the things we can do.

(mother wet mopping)

Keep your home as free of dust as possible. Wet mop and wet dust every day - this is much more effective than vacuuming only. Make sure your child's play areas are free from dust.

(mother cleaning toy)

Make sure your child's toys are clean and free from dust at all times.

(child picking up banana from ground)

Make sure your child never eats foods or sweets that have fallen on the ground, whether at home or outside.

(mother with child outside)

Supervise your child at all times when the child is playing outside, and make sure the child's hands are always free from dust and soil. If this is not always possible, make sure you teach your child never to put the fingers in the mouth, if they get dirty, without washing them first.

(mother washing child's hands)

Always wash your child's hands when they come home from being outside and before meals. Teach your child to get in the habit of always washing hands whenever the child comes home from outside.

(mother cutting child's nails)

Cut your child's nails regularly, at least once a week.

(mother washes an apple)

Make sure your child never eats fresh fruits and vegetables unless they are peeled or thoroughly washed and scrubbed first. Teach your child never to pick fresh fruits or vegetables, or be given fresh fruits or vegetables outside the home, without ensuring they have been carefully washed and scrubbed first.

(father telling children not to play in soil)

....and we can all help each other. If you see any child in Zlatna playing in soil or dirt please tell them to stop doing so and to go home and wash their hands.

GOOD NUTRITION AND PROTECTION FROM THE EFFECTS OF LEAD POLLUTION

(vegetables, milk bottle and babies' milk bottle)

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Calcium and iron in the diet will help to protect your child from the effects of lead poisoning. Doctors advise all people (particularly children) who live where they are exposed to lead poisoning to eat extra quantities of foods rich in calcium and iron. These foods are milk and vegetables with dark green leaves such as (spinach and two other veges mentioned in the Romanian). Make sure that your child is given extra quantities of these important foods.

HELPING TO CLEAN UP AND MAKE SAFE OUR CHILDREN'S PLAY AREAS

The two kindergartens in Zlatna are now going to see what can be done to make the outside play areas free from dust and soil to make them safe play areas for children. If you would like to help in this important activity, please contact your child's kindergarten teacher. If you have your own garden, make sure your children play only on grass areas or hard surfaces and not where there is soil or dust. If you live in an apartment, see what you can do to get together with your neighbors and clean up areas around your apartment where your children play. You can receive advice on the best ways of doing this from the Zlatna Dispensary.

Advise your children to play only on hard surfaces or grassy areas free from dust and soil.

HOW CAN I TELL IF MY CHILD IS SUFFERING FROM THE EFFECTS OF LEAD POLLUTION ?

It often is not easy to tell if a child is suffering from the effects of lead pollution. The best way is to check the level of lead that is in the child's blood. This is why we have been doing this in Zlatna for all children from 1 to 6 years of age. **IF YOUR CHILD IS ONE TO SIX YEARS OF AGE AND HAS NOT BEEN CHECKED FOR BLOOD LEAD, DISCUSS THIS WITH THE NURSES FROM THE ZLATNA DISPENSARY. THEY CAN HELP YOU.**

WHAT DO I DO WHEN I GET THE RESULT ?

(nurse, mother and child)

The nurses from the Zlatna dispensary will give you the result of the blood lead test for your child. They will tell you if your child is free from any health problem caused by lead or if there is a problem that requires attention.

IF YOUR CHILD IS NOT PRESENTLY AT RISK

Congratulations! Your child, right now, is safe. But keep this leaflet and continue to ensure that your child remains free from dust and lead. We can never do enough to ensure our children continue to be free from lead poisoning. Please bring your child to the dispensary one year from now, and we will check the blood lead level again.

IF YOUR CHILD IS AT RISK FROM THE EFFECTS OF LEAD POLLUTION

Your child is being exposed to lead from dust and soil. Read this leaflet carefully with the nurse

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from the dispensary, consider together the ways that your child might be being exposed, and do everything you can to reduce this exposure. Bring your child to the dispensary for a medical examination and guidance from the doctors and nurses. Every six months, bring your child for a further blood lead test blood lead test (or as advised by the nurse at the dispensary).

The Child Lead Protection Program Coordinating Committee

The Zlatna Dispensary

Produced by : The Alba Iulia District Health Education & Promotion Department

A component of the Environmental Health Project supported by :

The United States Agency for International Development (logo)

În continuare vă prezentăm câteva modalități de protejare a organismului copiilor dumneavoastră în special față de intoxicația cu plumb:

- asigurați-vă ca mâinile copiilor să fie curate tot timpul și mai ales să nu fie murdare cu pământ sau praf
- tăiați unghiile copiilor odată pe săptămână
- în locuință, măturați cu o mătură umedă și spălați pe jos și ștergeți praful cu o cârpă umedă în fiecare zi, ca să se ridice cât mai puțin praf
- asigurați-vă ca jucăriile copiilor să fie curate și lipsite de praf
- obișnuiți copii să nu mănânce alimente sau dulciuri care au căzut pe jos
- obișnuiți copii să nu mănânce fructe sau legume înainte de a fi bine spălate, pentru a îndepărta toate particulele de sol sau praf de pe ele
- nu lăsați copii să se joace cu pământ sau nisip



- supravegheați copiii să nu introducă degetele prăfuite sau murdare cu pământ în gură; obișnuiți-i ca după ce se joacă afară, să se spele pe mâini dacă se murdăresc și să nu se șteargă la gură sau să nu-și sugă degetele înainte de a se spăla
- dacă se poate, oferiți copiilor voștri cât mai mult lapte precum și legume și zarzavaturi proaspete, spălate bine în prealabil; aceste alimente bogate în calciu și fier vor proteja copiii față de intoxicația cu plumb
- faceți tot posibilul și acționați ca locurile de joacă de la grădiniță să fie curate și lipsite de praf sau pământ contaminat; educatoarele vor fi bucuroase să primească orice ajutor concret din partea dumneavoastră
- ar fi de dorit ca și în alte locuri din oraș unde sunt spații de joacă, pământul contaminat cu plumb să fie îndepărtat, eventual întors pe o adâncime de 10 cm, acoperit cu asphalt, beton sau dale de piatră sau însămânțat cu iarbă; ajutorul dumneavoastră este bine venit și în această privință.

Priviți în jur, în propriul cartier, în zona în care locuiți și încercați, împreună cu vecinii și prietenii dumneavoastră, să stabiliți ce se poate face pentru a curăța orașul de praful contaminat cu plumb, începând cu propria curte sau spațiul în care se joacă copiii voștri. Îndrumări privind modul cel mai eficient în care se poate face acest lucru se pot obține de la personalul medical al dispensarului medical din Zlatna.

NUMAI ÎMPREUNĂ VOM REUȘI SĂ TRANSFORMĂM ORAȘUL ZLATNA ÎNTR-UN LOC MAI PLĂCUT ȘI MAI SĂNĂTOS PENTRU COPIII NOȘTRI!

Material editat de Laboratorul Județean de Educație pentru Sănătate și Promovare a Sănătății Alba-Iulia, în colaborare cu Centrul Medical, de Servicii de Sănătate și de Conducere Cluj-Napoca, filiată a Institutului de Igienă, Sănătate Publică, Servicii de Sănătate și de Conducere București. Redactat și distribuit în cadrul "Proiectului pentru Sănătatea Mediului Înconjurător și a Comunității Zlatna".
Coordonator și sponsor: "Agenția SUA pentru Dezvoltare Internațională" (USAID).



PROIECTUL PENTRU SĂNĂTATEA
MEDIULUI ÎNCONJURĂTOR
ȘI A COMUNITĂȚII ZLATNA

Dispensarul Medical Zlatna

**Să transformăm
orașul Zlatna
într-un loc
mai sănătos pentru
viața copiilor noștri**

Să ne ferim copiii
de

INTOXICAȚIA CU PLUMB

- 1995 -



ENVIRONMENTAL HEALTH PROJECT - ZLATNA

GENERAL LEAFLET - for general information

MAKING ZLATNA A HEALTHIER AND MORE PLEASANT PLACE FOR OUR CHILDREN TO LIVE

PROTECTING OUR CHILDREN FROM LEAD POISONING (family enjoying the country)

We all want to live in a healthy environment with clean and fresh air; where our children can grow up to be happy, strong and safe. But we also know that we have to work and that we need industry in order to satisfy the needs of our society. Unfortunately, industry can, also, create problems for our environment.

For example, here in Zlatna, we certainly need the benefits of the copper smelter, it produces copper that our industries need and, of course, very many of us are employed there also.

We also know that the smelter is a source of pollution. We see it all around us.

The question is, what can be done about this? Surely there must be ways that we can benefit from the smelter and yet make our town a better, safer and less polluted place to live.

REDUCING THE POLLUTION FROM THE PLANT

First of all, the amount of pollution that the plant produces can be reduced. Right now, the smelter is beginning the process of doing that. New equipment will be installed at the plant during 1995 which will reduce the pollution. In addition, measures are being taken to improve the health and safety of those of us who work at the plant.

But we also have to be realistic.

For over 200 years the copper smelter has been at work in Zlatna, and over all this time the smelter has been depositing lead onto the soil and dust of our town. This lead pollution that exists now in our town won't go away even if we reduce the pollution that the plant gives out.

WHAT SORT OF POLLUTION SHOULD WE WORRY ABOUT ?

We all notice, very easily, when our air is polluted. We cough and our eyes water. But there is another source of pollution which is, in many ways more serious, particularly for our children, and that is lead pollution. Lead pollution is more difficult to see but it is all around us in the soil and dust of our town. Lead pollution can cause lead poisoning, which is especially dangerous for children.

WHY IS LEAD POISONING MORE SERIOUS FOR OUR CHILDREN ?

We can only be affected by lead poisoning if the lead which is in soil and dust enters our bodies. Older children and adults generally avoid getting soil and dust into their mouths. But younger children are not so careful. They like to play with soil and sand; they suck toys that may have soil and dust on them; they may pick up food dropped on the ground; they may pick, or be given, fresh fruits and vegetables and eat them without washing them first; they often suck their fingers which may have dust or soil on them.

Children, being smaller than adults, are also more likely to be more seriously affected by lead poisoning than adults.

HOW DOES LEAD AFFECT THE HEALTH OF CHILDREN?

Lead can affect the health of children in a number of ways, and research shows that some children are affected more than others. Lead poisoning can affect the development of the brain which can lead to learning problems; to reduced growth and to hearing problems.

HOW CAN I TELL IF MY CHILD IS SUFFERING FROM LEAD POISONING?

The best way to tell is to check the level of lead in the blood of your child. This is why the team from The Center for Health Services and Health management in Cluj, working with the doctors and nurses of our dispensary in Zlatna, have been taking blood lead samples from children from 1-6 years of age. In this way we can tell whether any of our young children are suffering from the effects of lead pollution or might be suffering from lead poisoning. If the results show that lead pollution is, or might be, a problem for your child, the nurses at the Zlatna dispensary will discuss the situation with each child's parents or caregiver and recommend appropriate action.

IF MY CHILD HAS NOT YET BEEN TESTED FOR BLOOD LEAD, CAN I STILL GET IT DONE?

Yes, if your child is between 1 and 6 years of age you can have your child's blood lead tested.

Just go to the Zlatna dispensary and they will arrange it.

WHAT IF I THINK AN OLDER CHILD CHILD MAY BE SUFFERING FROM LEAD POISONING?

If you feel that any child, even a child older than 6 years may be suffering from lead poisoning the doctors and nurses at the Zlatna dispensary should be consulted. They can help you.

WHAT CAN I DO TO PROTECT MY CHILD FROM LEAD POISONING ?

We can do many things to help make living and working in Zlatna a more pleasant and healthier place. Of course we are doing what we can, right now, to protect and promote our children's health, but there are many things we can do to keep them safe from the problems of lead pollution and lead poisoning.

- ▶ Make sure their hands are free from dust and soil at all times
- ▶ Clip their finger nails once a week
- ▶ Wet mop and wet dust our houses as often as possible, every day if we can, to keep them dust free
- ▶ make sure their toys are clean and free from dust
- ▶ Teach children not to eat any food or sweets that have fallen on the ground
- ▶ Teach children not to eat any fresh fruits or vegetables before they are well washed and scrubbed
- ▶ Try to make sure that children don't play with the earth or soil outside
- ▶ If children play outside, try to supervise their play so that they don't put dusty or dirty fingers in their mouths; and teach them to come home and wash their hands if they get dusty or dirty and not to wipe their mouths or lick their fingers or hands before washing them
- ▶ If you can, give your children plenty of milk and vegetables that have dark green leaves, such as (spinach and two others listed in the Romanian). These foods being rich in calcium and iron will really help your child avoid the effects of lead on the child's health.
- ▶ Discuss plans to make sure the kindergarten play areas are cleaned and made free of dust and soil lead. The kindergarten teachers will appreciate any help you can give them to support this important effort. It is hoped that other safe play areas can be created in Zlatna that are free of dust and soil lead.
- ▶ Look around your own housing areas or gardens, join together with your neighbors and friends and see what you can do to clean up public and private garden areas where children play. You can get advice on how best to do this from the Zlatna dispensary staff.

LET US ALL, TOGETHER, MAKE ZLATNA A MORE BEAUTIFUL AND MORE HEALTHY PLACE TO LIVE

Produced by : The Alba Iulia District Health Education & Promotion Department

A component of The Environmental Health Project Supported by :
The United States Agency for International Development. (logo)

2. *Dacă aveți o curte sau o grădină proprie unde se joacă copiii:*

- dacă este posibil, îngrădiți toate suprafețele de pământ mai expuse poluării (grădini cu flori, legume sau zarzavaturi), pentru a limita accesul copiilor
- acoperiți orice suprafață de pământ liberă, neacoperită, cu dale de piatră, asfalt sau beton sau însămânțați-o cu iarbă
- dacă este posibil, mai ales pentru ocrotirea copiilor mici, îngrădiți locurile speciale de joacă în prealabil pavate, asfaltate sau însămânțate cu iarbă
- dacă vara este călduroasă și uscată, protejați aceste locuri speciale de joacă cu o folie de plastic
- verificați mereu ca mâinile copiilor mici să fie curate, fără pământ sau praf, îndemnându-i să se spele pe mâini cu săpun, cât mai des posibil.

3. *Dacă locuiți la bloc:*

- asociați-vă la aceste acțiuni cu alte familii vecine care au copii mici
- creați în jurul blocului locuri în care copiii dumneavoastră să se poată juca feriți de contaminare
- curățați și spălați spațiile pline de praf
- acoperiți suprafețele mici de pământ cu dale de piatră, beton sau asfalt
- îngrădiți suprafețele mai mari de pământ care sunt expuse poluării
- dacă este posibil, îngrădiți locurile speciale de joacă pentru copiii mici
- asigurați-vă mereu ca mâinile copiilor dumneavoastră să nu fie murdare cu praf sau pământ, prin spălarea lor cu săpun atunci când se murdăresc.

SĂ TRANSFORMĂM CU TOȚII ORAȘUL ZLATNA ÎNTR-UN LOC MAI PLĂCUT ȘI MAI SĂNĂTOS PENTRU COPIII NOȘTRI!

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PROIECTUL PENTRU SĂNĂTATEA
MEDIULUI ÎNCONJURĂTOR
ȘI A COMUNITĂȚII ZLATNA

Dispensarul Medical Zlatna

**CUM SĂ AMENAJĂM
PENTRU COPIII NOȘTRI
LOCURI DE JOACĂ MAI
CURATE ȘI MAI FERITE
DE
EFECTELE
DĂUNĂTOARE ALE
PLUMBULUI DIN PRAF
ȘI SOL**

-1995-

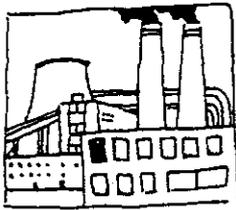


I want to grow up healthy, too.

SĂ AMENAJĂM SPAȚII SIGURE DE JOACĂ PENTRU COPII

Timp de 200 de ani, particule de plumb provenind din procesul de prelucrare a cuprului la topitoria din Zlatna s-au depus din aer pe sol, sub formă de compuși, acumulându-se în oraș și în împrejurimile sale.

Praful și solul sunt în prezent amestecate cu substanțe ce conțin plumb



sub forma unor particule practic invizibile. Plumbul din praf și sol poate pătrunde însă cu ușurință în organismul copiilor, mai ales în al celor

mici, care nu sunt suficient de atenți pentru a evita pătrunderea prafului și pământului în gură, în special prin intermediul mâinilor murdare.

Plumbul conținut în acest praf și pământ este un pericol pentru dezvoltarea copiilor mai mici, deoarece, intrat în organism, le poate produce întârzieri în dezvoltarea fizică sau în dezvoltarea sistemului lor nervos, ducând și la slăbirea auzului.

De aceea, atunci când copiii noștri (mai ales cei între 1 și 6 ani) se joacă în aer liber, trebuie să-i supraveghem cât mai bine, astfel încât să nu-și murdărească mâinile cu praf și pământ, iar dacă și le murdăresc, să nu le introducă în gură înaintea spălării lor imediate cu săpun.

Desigur, nu este ușor să ne supraveghem copiii în permanență. Din acest motiv, este recomandabil să creăm în locurile comune de joacă, în cele de la grădiniță, în curțile sau grădinile noastre, spații unde copiii noștri se pot juca mai în siguranță, protejați de riscul pătrunderii particulelor de plumb, prin gură, în organism.

Copiii nu trebuie să se joace în locurile cu depuneri de pământ sau praf. Spațiile de joacă cele mai sigure sunt cele cu suprafețe tari (pietruite, betonate sau asfaltate) sau cele cu iarbă, deoarece de pe aceste suprafețe ploaia spală praful cu conținut de plumb.

In oraș, suprafețele mai mici de pământ trebuie însămânțate cu iarbă sau acoperite cu piatră sau asfalt. Totodată, mai ales dacă verile sunt uscate și foarte călduroase, putem acoperi temporar, cu o folie de plastic, suprafețele tari, pentru a le proteja de depunerea prafului.

CUM PUTEȚI PARTICIPA PERSONAL LA AMENAJAREA LOCURILOR CURATE DE JOACĂ PENTRU COPII

1. *Dacă aveți un copil care merge la grădiniță:*

Educatoarele de la grădiniță vor coordona transformarea spațiilor actuale de joacă pentru copii în spații mai curate. Dacă doriți să participați ca voluntar la o astfel de acțiune, prezentați-vă la grădiniță iar dacă doriți să vă asigurați că va exista în viitor un loc curat de joacă pentru copilul dumneavoastră și la școală, adresați-vă directorului școlii.

Va fi nevoie de ajutor pentru acoperirea cu un strat de asfalt sau beton a unor suprafețe unde nu crește sau nu poate crește iarba sau pentru îngrădirea sau însămânțarea cu iarbă a unor suprafețe de pământ mai expuse poluării cu plumb.



OPRIȚI CONTAMINAREA CU PLUMB A COPIILOR!

- * limitați ingestia plumbului
- * îmbunătățiți nutriția copiilor
- * curățați locurile de joacă

*Dispensarul medical Zlatna vă stă la dispoziție
pentru informații și îndrumări.*

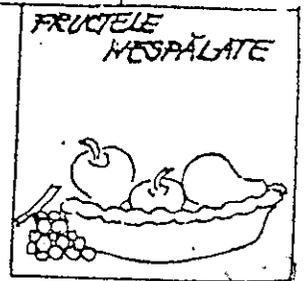
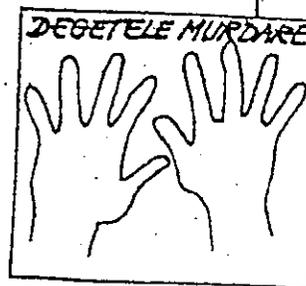
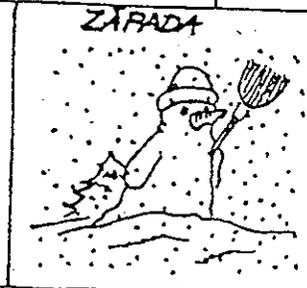
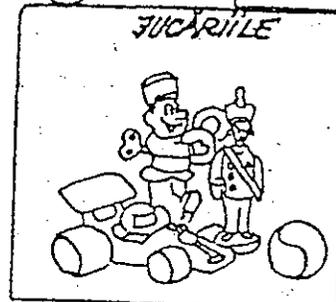
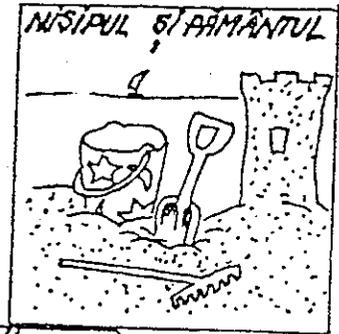
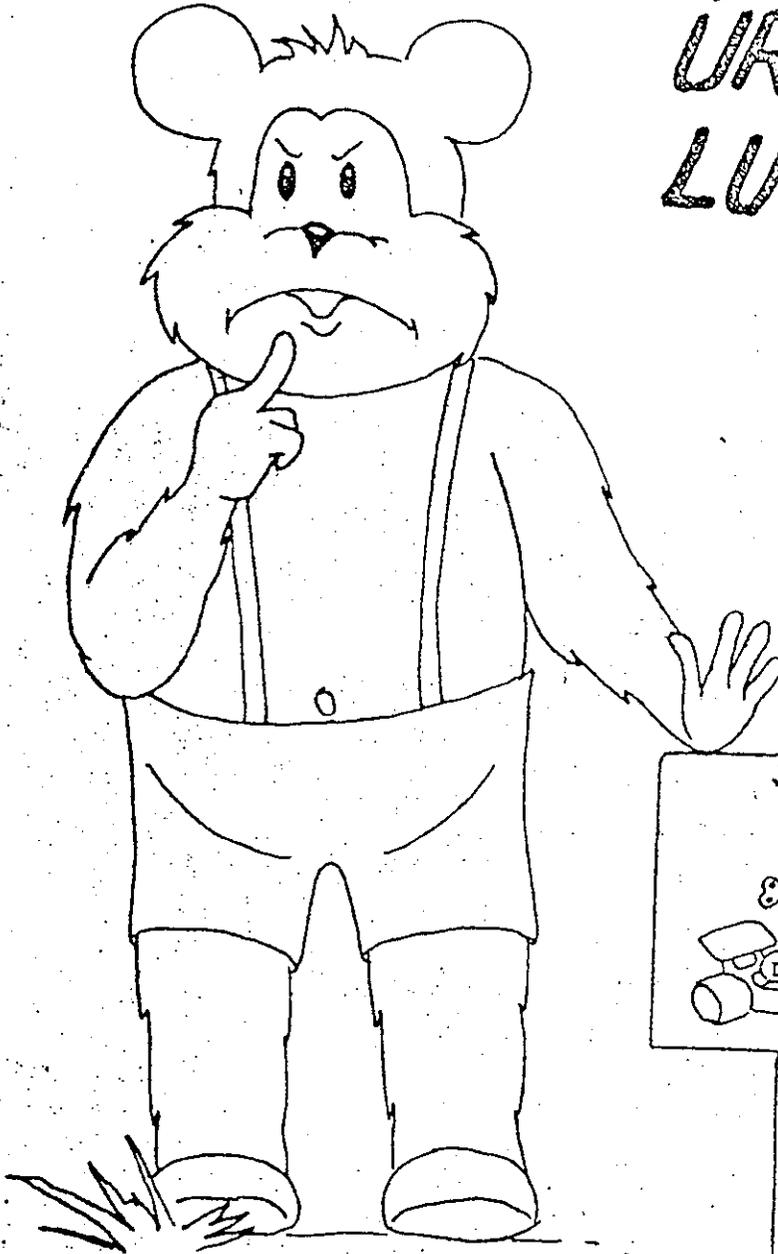


Cartea mea
de colorat
SĂ NE FERIM DE
INTOXICĂȚIA CU RUMB!

Laboratorul Județean de Educație pentru Sănătate
și Promovare a Sănătății Alba Iulia

Dispensarul Medical Zlatna
- 1995 -

NU DUCETI LA GURA URMATARELE LUCRURI:



SPĂLATI-VĂ PE MĂINI

DUPĂ CE VENIȚI DE LA JOACĂ ȘI
ÎNAINTE DE FIECARE MASĂ!



NU MÂNCĂȚI
ALIMENTELE
CĂZUTE PE JOS!



SPUNETI PĂRINȚILOR
SĂ VĂ TAIE UNGHIILE
ÎN FIECARE SĂPTĂMÂNĂ!

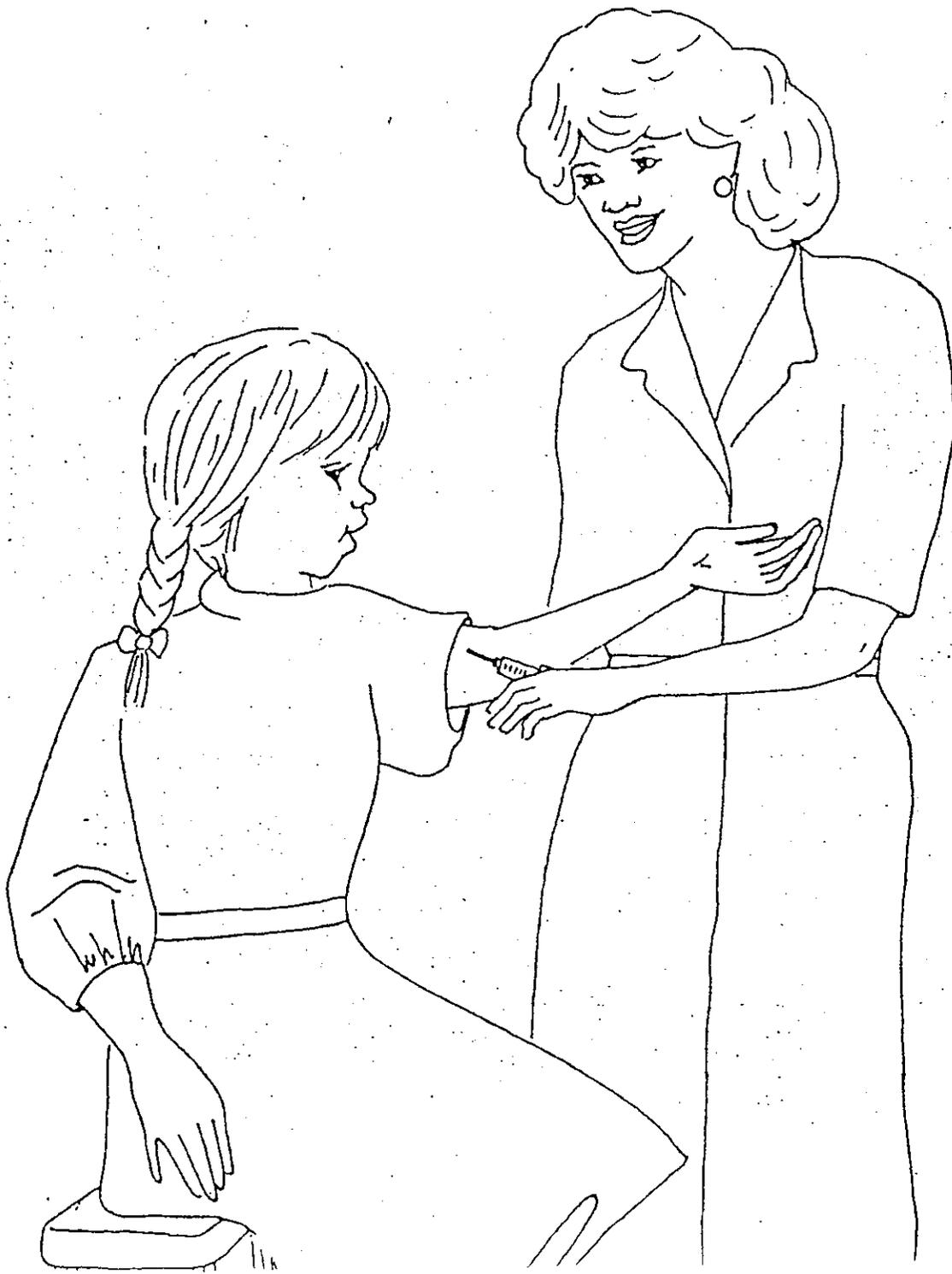


FUCAȚIVĂ

NUMAI ÎN LOCURILE,
INDICATE DE PĂRINȚI!



ATI FOST LA DOCTOR PENTRU
ANALIZA DE SANGE ?



ZLATNA,
VA FI UN ORAȘ MAI SĂNĂTOS
PENTRU TOTI
COPILII!



Material editat cu sprijinul Agenției S.U.A. pentru Dezvoltare Internațională



Attachment 5

COUNSELING MESSAGES AND INFORMATION FOR DOCTORS

COUNSELING MESSAGES TO ACCOMPANY CHILD BLOOD LEAD RESULTS

The March 1995 child blood lead sampling effort in Zlatna has shown that children in Zlatna have a wide range of blood lead levels. On the basis of their blood lead levels, children can be grouped according to their risk for adverse health effects. The messages and recommendations provided to parents in conjunction with individual child blood lead results will be based on the urgency and type of follow up needed.

- **Young children (1-6 years) are the most important group to evaluate** because they are the most sensitive to lead, their normal play behavior results in greater exposure to lead in soil and dust, and they absorb lead into their bodies more than older children or adults. For infants and young children, lead exposure has been shown to cause significant learning problems, reduced growth and hearing problems that can affect the child throughout their life even if the source of lead is removed in the later years of childhood.
- **Children may take lead into their bodies from a variety of exposure pathways.** In Zlatna, the most important exposure pathways for young children appear to be ingestion of lead-contaminated soil and dust from their hands and from toys or play objects (such as paper darts) during play activities and eating fruits and vegetables that have not been washed enough to remove lead-contaminated soil from their surface. Because smelting has occurred in Zlatna for over two hundred years and because lead is very persistent in the environment (does not break down), these exposure pathways would still exist even if emissions from the smelter were eliminated.
- **Good nutrition, including vitamins, minerals, calcium and iron will help to reduce the amount of lead absorbed by a young child.**
- **Current efforts to develop safe play areas** include a collaborative effort between Ampellum, the Kindergarten parents and teachers, and American donors to clean up and improve the playgrounds at the two Kindergartens in Zlatna and the Kindergarten in Patrengeni. If you would like to participate in this project, please see the Director of the Kindergarten at your child's school.
- **Actions currently being taken by Ampellum to reduce lead in the air include:**
 - Refurbishment of the "new smelter" including a new baghouse filter to capture lead-containing particulate matter before it reaches the air
 - Taking the old smelter off-line in 1995 and refurbishing it to reduce emissions and increase efficiency
 - Current investigations of other options for reducing lead emissions

RISK	BLOOD LEAD CONCENTRATION (ug/dL)	MESSAGES/ACTIONS
LOW	< 20	<ul style="list-style-type: none"> ○ Some adverse health effects from lead may occur at levels as low as 15 ug/dL ○ Educate parents/caretakers about how to avoid exposure to lead in young children ○ Educate parents about diet, cleaning, supervision, etc. ○ If exposure potential is low, based on questionnaire, retest in one year
MEDIUM LOW	20-34	<ul style="list-style-type: none"> ○ Adverse health effects are likely ○ Educate parents about avoiding exposure pathways ○ Conduct a detailed assessment of child's environment and eliminate lead sources wherever possible ○ Educate parents about diet, cleaning, supervision, etc. ○ Retest in one year
MEDIUM HIGH	35-59	<ul style="list-style-type: none"> ○ Likelihood of adverse health effects is high ○ Educate parents about avoiding exposure pathways ○ Conduct a detailed assessment of child's environment and eliminate lead sources wherever possible ○ With assistance from parents, identify behaviors or activities which may be contributing significantly to lead exposure and how those behaviors can be changed ○ Ensure that diet includes sufficient calcium (600-800 mg/day) and vitamins with iron ○ Refer to Zlatna Hospital for further evaluation and follow up plan for future management and testing
HIGH	> 60	<ul style="list-style-type: none"> ○ Likelihood of adverse health effects is very high ○ Refer to Zlatna Hospital for further evaluation and follow up plan as soon as possible ○ Educate parents about avoiding exposure pathways ○ Conduct a detailed assessment of child's environment and eliminate lead sources wherever possible ○ With assistance from parents, identify behaviors or activities which may be contributing significantly to lead exposure and how those behaviors can be changed ○ Ensure that diet includes sufficient calcium (600-800 mg/day) and vitamins with iron

INFORMATION FOR DOCTORS REGARDING A MEDICAL RESPONSE PLAN

- o Reducing exposure to lead is definitely the most successful way to reduce blood lead levels over the long term.
- o Chelation therapy can do more harm than good if it is not accompanied by a plan to reduce the child's exposure to lead in their daily environment. This plan must include education and medical support for parents, teachers and all other caretakers for the child, as well as education for the child directly. If a child undergoes chelation therapy and is then returned to the same environment, it is likely that their blood lead level will increase to higher levels than before the treatment.
- o Poor nutritional status and especially calcium and iron deficiencies can greatly increase the amount of lead that a child absorbs from their environment. Lead mimics both calcium and iron and will compete with these elements for binding sites. The diet and nutritional status of each child must be evaluated to determine whether there is adequate calcium intake, approximately 600-800 mg/day. This can be in the form of yogurt, milk or pudding. A simple wet chemistry test, which I believe is available in Zlatna, should be done to determine iron deficiency. If calcium or iron deficiencies exist or are suspected for any young child (1-6 years old), regardless of blood lead level, supplements should be provided because they will reduce the amount of lead that a child absorbs. In the U.S., multiple vitamins for children may contain iron or calcium supplements. It is better for adequate calcium to be provided in the diet, however, supplements must be provided if the diet is inadequate. Iron deficiency has also been shown to decrease the effectiveness of chelation therapy.
- o Additional considerations regarding the usefulness of chelation therapy for children with higher blood lead levels:

1. An Elevated Blood Lead Concentration That Has Been Confirmed by a Second Test

Ages 1-4 years:	> 50 ug/dL
Ages 5-11 years:	> 60 ug/dL

Additional considerations associated with specific blood lead levels:

ug/dL

40-50

Every effort should be made to identify the major sources of lead exposure for each child, individually, in this group. If removable sources are identified and it is determined that exposure pathway intervention may be successful, coordinate with the child's caretakers to implement the appropriate actions and retest in 6 months. If a clinical evaluation (protocol attached) indicates additional symptoms of lead poisoning, consider chelation in conjunction with aggressive exposure pathway intervention.

- > 50 **Chelation therapy will likely be needed for children aged 1-4 years**, due to the sensitivity of their nervous system at these ages, in conjunction with aggressive exposure pathway interventions. A thorough clinical evaluation should be done to the extent possible with special attention to the presence of symptoms (see #2 below).
- > 60 **Chelation therapy will likely be needed for children aged 5-11 years** in conjunction with aggressive exposure pathway interventions. A thorough clinical evaluation should be done to the extent possible with special attention to the presence of symptoms (see #2 below).
- > 70 These children need to be given the highest priority for chelation therapy due to the potential for encephalopathy. In addition, they need aggressive exposure pathway interventions.

2. Presence of Symptoms (all or some of the following)

It should be noted that significant lead poisoning (associated, for example with loss of IQ points) may occur in young children without any definitive signs, symptoms or laboratory findings except for elevated blood lead. The following symptoms, however, are typical early signs of lead poisoning:

- | | | | |
|---|-------------------|---|--|
| - | sleep disturbance | - | delayed language development |
| - | anorexia | - | positive urine test (glucosuria, proteinuria, amino aciduria, increase phosphate clearance |
| - | irritability | | |

3. Protocol

A protocol for inpatient treatment with CaNa₂ EDTA was faxed previously. Following are some additions/alternatives to that information:

- o The child must be removed from Zlatna to a lead-free environment for treatment.
- o CaNa EDTA can be administered intramuscularly with the use of lidocaine to reduce the pain. The regime would be two (2) injections per day (every twelve hours) for a maximum of five (5) days. The dose should be determined on the basis of skin surface area, as noted on the transmitted protocol.
- o The follow up to the five (5) day therapy should be three (3) days of rest followed by a single half dose every other day for five (5) days, i.e., three additional doses.
- o X-rays for determining the presence of lead lines in long bones are not a good screening tool because chelation is not known to be especially effective in removing lead from bones.

- o Meso-2,3-dimercaptosuccinic acid (DMSA or "succimir") is often the chelation drug of choice because it can be administered orally, appears to be more effective than EDTA and is more specific for heavy metals than EDTA. Due to the ease of administration, use of DMSA has lowered the blood lead levels at which children in the U.S. are treated. The U.S. manufacturer of DMSA (McNeil) has applied for registration in Romania and is awaiting approval.

4. Follow Up

- o The child needs to remain in a lead-free environment for 6-8 more weeks with an additional blood lead test 2-4 weeks after the chelation therapy to see if re-equilibrium is occurring. For children who have been exposed chronically (for a long time), re-equilibration (movement of lead from bones and other compartments back into the blood) may mean that the child's blood lead level will return to pre-treatment levels even in a lead free environment. This rebounding effect may be delayed or prevented with additional chelation therapy on a case by case basis.

A variety of effective chelation therapies may be utilized depending on the status of the individual child and the resources and drugs available in Alba Iulia. **The importance of case management and follow up with the child after chelation therapy, however, is critical and cannot be over-emphasized.**

Attachment 6

AGENDA FOR AIR QUALITY SEMINAR, NOVEMBER 1994

Tuesday, November 1st (Emphasis on Ambient Air Monitoring)

Morning Session (8:30 - 12)

- Introductions
- Discussion of Seminar Objectives
- Air Quality Goals and Standards
- Air Quality Problem Definition - Monitoring to Answer Specific Questions
- Station Configurations/Options
- Monitor Siting - Macroscale, Microscale, and Meteorological Consideration

Afternoon Session (1 - 4:30)

- Use of Monitoring Data - Problem Definition and Trends Analysis
- Monitoring Network Case Study
- Field Trip to View and Discuss Monitor Siting Options
- Overview of Advanced Technology (Optional)

Wednesday, November 2nd (Emission Estimation, Inventory Development, and Modeling)

Morning Session (8:30 - 12)

- Estimation of Facility Emissions - Testing, Calculation, and Estimation Procedures
- Air Emission Inventory Development - Questionnaires and Forms

Afternoon Session (1 - 4:30)

- Computer Modeling of Air Emissions - Overview/Uses
- Demonstration/Hands-On Examples/Case Studies

Thursday, November 3rd (Regulation/Permit Development and Pollution Control)

Morning Session (8:30 - 12)

- Overview of United States Regulatory Approaches and Programs
- Overview of Common Air Pollution Control Equipment
- Regulatory Trends

Afternoon Session (1 - 4:30)

- Considerations for Effective Regulation or Permit Development
- Overview of Reference Materials
- Course Evaluation

Attachment 7

EHP OCCUPATIONAL HEALTH AND SAFETY TRAINING COURSE OUTLINE

Day 1 A.M.

- Introduction
 - Personal Introductions
 - Course Overview and Objectives
- Romanian Occupational Health and Safety Working Group Presentations
 - Romanian Occupational Health and Safety regulatory requirements;
 - Romanian Health and Safety Ministry, Directorate, Group Rules and Responsibilities;
 - Review of Ampellum S.A. Occupational Health data, Medical Programs and review of programs at Baia Mare and Copsa Mica.
- Collecting Valid Representative Samples for evaluation

LUNCH

Day 1 P.M.

- Rotating concurrent lab sessions
 1. Calibration of a Rotometer
 2. Calibration of an Air Sampling Pump using Primary Standards
 3. Calibration of an Air Sampling Pump using a Rotometer

Day 2 A.M.

- Air Sampling and Analysis

LUNCH

Day 2 P.M.

- Rotating concurrent lab sessions
 1. Calibration of a Critical Orifice
 2. Personal sampling pump use, maintenance, and repair (discussion and hands-on using pump manual)
 3. Calibration and use of real time sulfur dioxide monitoring devices. (discussion and hands-on using SO₂ monitor manual)

Day 3 A.M.

- Toxicology
 - Exposure routes
 - Acute vs. Chronic toxicity
 - Local vs. systemic toxicity
- Lead toxicology
 - Exposure routes
 - Absorption

- Excretion
- Effects of lead poisoning
 - Central nervous system (CNS)
 - Gastro intestinal
 - Renal
 - Hematological
- Romanian Working Group input, medical intervention, etc.
- Toxicology of sulfur dioxide
 - Acute vs. chronic effects
 - Local vs, systemic effects
 - Exposure routes
 - Metabolic/physiological effects
 - Romanian Working Group input, control programs, medical intervention

LUNCH

Day 3 P.M.

- Rotating concurrent lab sessions
 1. Respirator fit testing
 2. Respirator cleaning, maintenance and repair
 3. Diagnostic sampling to identify high exposure tasks

Day 4 A.M.

- Control methods
 - Administrative controls
 - Protective equipment
 - Engineering controls
- Supervisor training (train the trainer)
 - Periodic health and safety meetings
 - Short (10-15 minute) meetings
 - General topics
 - Respirator fit, care, cleaning
 - Lead - personal hygiene
 - Lead - potential contamination of personal clothing
- Romanian Working Group input concerning ways to increase worker use of personal protective equipment

LUNCH

Day 4 P.M.

- Rotating concurrent lab sessions
 1. Training techniques for providing lead training to workers
 2. Data evaluation techniques and statistical analysis
 - Sample population
 - Calculation of confidence limits
 - Statistical trends in blood lead and airborne lead
 3. Data collection forms, storage and retrieval

Day 5 A.M.

- Hazard assessments
 - Development of sampling strategies
 - Personal and Area sampling
 - Interpreting results
- Review
 - Open discussion groups for key information review

LUNCH

Day 5 P.M.

- In-plant air monitoring and hazard assessments (rotating groups in approximately 4 hour blocks over next 1.5 days)
 - Group 1 - Practice personal air sampling techniques in-plant
 - Group 2 - Practice area air monitoring in-plant
 - Group 3 - Practice diagnostic air monitoring in-plant

Day 6 A.M.

- In-plant monitoring
 - Group 1 - Practice diagnostic monitoring in-plant
 - Group 2 - Practice personal monitoring in-plant
 - Group 3 - Practice area monitoring in-plant

LUNCH

- Group 1 - Practice area monitoring in-plant
- Group 2 - Practice diagnostic monitoring in -plant
- Group 3 - Practice personal air monitoring in-plant

Attachment 8

SUMMARY TABLE OF FUTURE ACTIVITIES

PROPOSED SUPPLEMENTAL ENVIRONMENTAL HEALTH ACTIVITIES IN THE ZLATNA/ALBA JUDET REGION AND COORDINATION FRAMEWORK

ACTIVITY	EHP1	EHP2	USEPA	ETP	USPC	EAP
1. Coordination of Zlatna/Alba environmental health activities for EHP 1 and 2, USEPA, ETP, USPC and EAP	R	P	P	P	P	P
2. Environmental data analysis, interpretation and application workshop including public outreach methods and techniques	R	I		P		I
3. Technical assistance and support for the three working groups established during the first year of EHP1	R			I		I
4. Redo KAP survey, blood lead survey and program evaluation in 6/96	R	P	?	P	P	P
5. Soil lead clean up demonstration workshop in Zlatna with community members invited from Copsca Mica and Baia Mare	P	I	R	P	P/I?	I
6. Development of community-based soil lead cleanup program with community members invited from Copsca Mica and Baia Mare	P	I	P	R	I	I
7. Environmental Action Plan workshop with three working groups and community members from Copsca Mica and Baia Mare	P			R		I
8. Facilitation of development of CME course in lead exposure, toxicology and treatment and development of lead intoxication training video	P	R?	P?			I
9. Small business development of milk products store in Zlatna	I			I	R	

R = RESPONSIBLE, P = PARTICIPATES, I = INFORMED, ? = TO BE DETERMINED

EHP1 = Extension of one year EHP Zlatna Activity begun in June 1994
EHP2 = EHP Curriculum Development Activity begun in 1995

USEPA = U.S. Environmental Protection Agency
ETP = Environmental Training Program
USPC = U.S. Peace Corps (Volunteer in Alba Iulia who works on small business development)
EAP = Environmental Action Program

Attachment 9

FOLLOW-UP SCOPE OF WORK

ATTACHMENT A: SCOPE OF WORK

I. BACKGROUND

Since June, 1994, as specified in Delivery Order 4 to the Environmental Health Project (EHP) requirements contract (HRN-5994-Q-04-3037-00), interventions aimed at addressing the most serious environmental and occupational health problems in the town of Zlatna, Romania have been undertaken by EHP. Zlatna is a community of approximately 8,000 inhabitants where the dominant source of pollution, as well as the principal employer, is the Ampellum S.A. copper smelter.

The three activities initiated in Zlatna have been designed to achieve the following goals:

1. Reduction of lead exposure to young children (1-6 years old), as measured by blood lead analysis;
2. Initiation of a worker health and safety program at the copper smelter based on the primary health risks identified at the plant; and
3. Initiation of a sulfur dioxide and lead particulate monitoring program in association with the local (Alba Judet) environmental protection agency (EPA).

Success in each of the three activities has been highly dependent on an integrated, multidisciplinary effort involving local health and education professionals, worker health and safety personnel in the smelter, as well as plant management and the local community (Zlatna), county (Alba Judet) and regional (Center for Medical Research in Cluj) participants in the program. When the EHP team first visited Zlatna in June 1994, agencies at the local, county and regional levels had little or no experience working together to solve environmental health problems and public involvement was not considered possible.

Though a more complete list of accomplishments for each working group is provided in Annex SOW-1, a summary of accomplishments realized includes the following:

- Formation of three Romanian interagency and community working groups, of six to eight members each, to develop the leadership and direction necessary for addressing environmental health issues related to each of the topics of concern and for achieving the desired goals.

- Identification, procurement and delivery of equipment for monitoring, screening and assessment activities for all three topics of concern including:
 - an atomic absorption spectrophotometer (AAS) with graphite furnace for blood lead analyses;
 - medical equipment for blood lead sampling;
 - hematofluorometer for blood lead screening;
 - a spirometer for lung function testing;
 - two fixed air monitoring stations for sulfur dioxide and particulate sampling, a computer for air quality data, management and analysis, as well as additional air sampling and meteorological equipment for the local high school;
 - a computer with graphics package for production of health education materials;
 - occupational health and safety equipment including work place and personal monitoring devices and respirators.
- Identification and assessment of potential investment/emission reduction opportunities at Ampellum, including preparations for diagnostic stack testing at various locations in the system with equipment to be provided by EHP in June 1995.
- Locally designed, household- and community-focused health education and counseling materials, as well as programs to reduce exposure of young children to lead.
- Community development activities which include community efforts to develop safe play areas for young children at the three kindergarten/pre-schools in the vicinity of the copper smelter.
- Improved management capacity within the working groups, as indicated by action plan formulation by each working group, including:
 - an evaluation of the first year of EHP activities,
 - tasks to be accomplished during the coming year and
 - identification local and external resources needed to implement the action plan.

In recent meetings with key participants and with the working groups, two general outcomes of the past year of activities were apparent:

- a significant increase in knowledge and understanding of the technical issues involved in each activity, such as the

establishment of a baseline for children's blood lead levels in Zlatna against which progress will be measured and

- an increase in activity by the working groups and a growing appreciation that the solution of the problems being addressed involves not only equipment, but also technical cooperation, training and public education/involvement.

Additional outcomes were related less to the specific problems being addressed and more to the process involved in addressing them. The Sixth Annual Symposium on Environmental and Occupational Health during Societal Transition in Central and Eastern Europe, held in Eforie Nord, Romania from 5-10 June 1995, included a half-day session on the Zlatna activities with a panel of speakers including Dr. Mary Ann Micka (USAID/Romania), Ms. Patricia Billig (EHP Team Leader) and several of the Romanian team members, including the Mayor of Zlatna. At the Symposium, the Mayor summarized the lessons learned in stating that the EHP work in Zlatna had been "a lesson in democracy."

There is a clear need and desire to consolidate the gains made to date, as well as to attempt to replicate this model using the Zlatna and Alba Judet counterparts to share what they have accomplished with other communities in Romania facing similar environmental and occupational health problems. In addition, potential investments in plant improvements in Zlatna and elsewhere under the Environmental Action Program (EAP) for Central and Eastern Europe (and supported by USAID through the EAP Support Project) provide the impetus for further interaction with those institutions directly concerned with environmental and occupational health in order to maximize the health benefits of these investments. Annex SOW-2 provides additional details regarding Romanian participant evaluations and future activities desired.

Major elements of follow-on, supporting activities in Zlatna include:

- **A training session on environmental data analysis and interpretation in addressing environmental health problems.** Each working group is acquiring new environmental data with the equipment provided by USAID through EHP, but the variety of approaches for evaluating and interpreting data in an environmental problem solving context are not well understood. The training session and associated technical assistance for the participants in the three Zlatna-based working groups are designed to address these issues in the context of their specific needs. In addition, risk communication to workers and the community will also be addressed.

- Support for working groups in the form of technical assistance in implementing their action plans, subscriptions to professional journals, coordination with other programs and dissemination of lessons learned and program approaches to other communities in the region with similar environmental health problems. Working group participants have begun to articulate the need for applying the lessons learned in Zlatna to the implementation of new national environmental policies as well as to communities with similar issues, e.g. Copsca Mica and Baia Mare. It is anticipated that individuals from other communities will participate in the Zlatna-based training activities described above.
- Coordination and communications management with other participating USG programs such as the Environmental Action Plan Support Project (investment preparation), U.S. Environmental Protection Agency (soil lead clean up), Environmental Training Project (detailed action plan development and coordination with other communities), and other EHP activities (continuing medical education curriculum development in lead intoxication health effects and treatment). There is currently an opportunity for several USAID programs to provide various pieces of an integrated, practical solution to the environmental health issues in Zlatna. The success of this integrated effort, however, will require that one program provide the coordination and communications management necessary for integration of diverse program components. The technical assistance and investment activities through the ENI/EEUD/ENR Environmental Action Plan Support (EAPS) Project recently initiated at the Ampellum copper smelter will benefit from having a well established environmental health program in place which can document the success of the anticipated investment effort. There is also the potential for other USAID activities in Romania, in particular the Environmental Health/Occupational Disease Partnership in Cluj and the Harvard Institute of International Development (HIID) policy reform activities, to build upon the current EHP efforts in Zlatna.

Table 1 summarizes the proposed supplemental environmental health activities and coordination framework for the Zlatna/Alba Judet region.

II. TASKS

The contractor shall be responsible for the following activities:

1. Participate in the coordination of Zlatna/Alba environmental health activities [July 1995 - December 1996]

There is currently an opportunity for several, in-place USAID programs to provide various pieces for an integrated, community-based solution to the environmental health issues in Zlatna. Organizations include the current ENI/EEUD/ENR-funded Environmental Health Project (EHP) activities in Zlatna (EHP1), the current ENI/HR/HP-funded EHP activities in Cluj in environmental and occupational health curriculum development (EHP2), the U.S. Environmental Protection Agency (EPA), the Environmental Training Project (ETP), the U.S. Peace Corps (USPC), and the Environmental Action Plan Support Project (EAPS). The overall program is summarized in Table 1. The success of this integrated effort will require technical coordination and good communications management among the diverse program components. In the past, the various groups, when planning the content of their technical interventions, often were not aware of related activities that had been occurring which their program could supplement or enhance.

In order to insure close coordination, the contractor will be responsible for keeping informed of the workplans of other USG and USAID-funded organizations, as they relate to Zlatna environmental health activities. USAID will require that these be sent to the contractor. The contractor will be responsible for providing feedback and recommendations to USAID/Romania and ENI/EEUD/ENR on points of integration and cooperation among the workplans as they relate to the contractor's activities implemented under this delivery order. The contractor will be responsible for ensuring appropriate communication with and inclusion of the appropriate Romanian participants from both the Zlatna community and the Alba Judet through the EHP local Romanian coordinator in making such recommendations.

Specific components of this activity include, but are not limited to:

- Conference calls and faxes to other USG-affiliated organizations active in the Zlatna region, as required to insure overall program coordination;
- regular briefings on such communications for USAID/Romania by telephone/fax and through the EHP local Romanian coordinator;
- trip, interim, and final report distribution to all of the active USG and USAID-funded parties in the Zlatna region;
- participation, as indicated in Table 1 and as appropriate, in other USAID-funded activities in the Zlatna region.

The responsibility for this task will be shared between U.S.-based personnel and a locally-hired coordinator.

2. Environmental data analysis, interpretation and application workshop and supporting technical assistance [September - December 1995]

Each working group is acquiring new environmental data with the equipment provided by USAID as part of the current EHP activities. This information is critical in both evaluating the impact of the current USAID-funded interventions and building capacity among the Romanian counterparts for evaluating progress towards environmental and environmental health goals. At this point, the variety of approaches for evaluating and interpreting data to problem solve in an environmental context are not well understood by the working group participants. In addition, they have had no experience extracting information from this type of data which is of interest to the public and communicating that information in an understandable format. This task is designed to address these issues.

This activity will have three components:

- 1) Collection of data by each working group for entry into an electronic data base which can be transmitted to the activity leader in the U.S. who will, in consultation with the EHP working group advisors, examine and evaluate each data set to determine the most appropriate analytical approaches and techniques to be addressed in the workshop;
- 2) Preparation of a three-day workshop, to be attended by all working group participants as well as key individuals from a second site (TO BE DETERMINED - see Tasks 5A and 5B), which would introduce them to the basic concepts and tools in environmental data base management, analysis and interpretation re: data currently being collected;
- 3) Conduct of the workshop followed by individual meetings with each working group for additional hands-on analytical techniques and discussion of issues pertinent to their specific data application needs.

3. Technical assistance to the three working groups established during the first year of the EHP Zlatna Activity [July 1995 - December 1996]

For all three working groups, the contractor will provide ongoing technical support and assistance in four areas, for which the details of implementation will be determined during work plan development (see Task 8, Table 1) :

1) Follow-up technical support from the U.S. by telephone and fax (i.e. not TDY support) for any questions that arise as data analysis and interpretation continues.

2) Extraction of information from the data analysis and interpretation phase that is of interest to the public and development of appropriate communication methods and formats. This component would be conducted by the mass media, marketing specialist in conjunction with the working groups and the EHP working group advisors. The public outreach approaches will be tailored to the audiences of each of the working groups. For example, for the lead working group, this will involve implementation of the health education and medical response plans developed during the first year of the EHP activity, focusing on parents and health workers. For the occupational health and safety group, messages will be tailored for workers at Ampellum. For the air monitoring group, methods of effectively communicating air quality information to the public (especially in Alba Iulia) will be introduced.

3) Improving access to international information resources, such as journals.

4) Other technical assistance in implementing working group action plans for activities in Zlatna. Specific issues for individual working groups include the following:

Lead

- assistance in the analysis and interpretation the blood lead and environmental lead sampling data and the application of results to the health education and medical response programs.
- increase the capacity of the Health Education Laboratory at the Sanitary Police in Alba Judet to produce health education program materials.
- assistance to the working group related to establishment of national policies on lead-related issues, if any, and in coordination with activities of the USAID HIID environmental policy reform activities.

Occupational Health and Safety

- assistance in conducting worker focus groups, a worker knowledge, attitudes and practices (KAP) survey and "training of trainers" for Ampellum plant OHS staff to increase their capacity for communicating and enforcing improved OHS practices with workers and management.
- further evaluation of the current health status of workers in relation to specific work areas, based on the data currently being collected and the analysis initiated as

part of Task 2. In addition, possible policy reform issues at the plant level will also be addressed. An example is the lack of enforcement of existing regulations regarding pregnant workers and the requirement that they be moved to less hazardous areas during pregnancy. Support of the OHS working group will be designed to increase their understanding of and capacity to deal with such issues. This will include gaining management commitment to implementation of the overall occupational health and safety plan.

- assistance in developing a formal respiratory protection program including overall design and addressing operation/maintenance issues. As appropriate, this activity will be executed in collaboration with the Environmental Health and Occupational Disease Partnership activity in Cluj.

- assistance in evaluating and interpreting work place and personal monitoring data, both in terms of risk presented as well as in relation to current Romanian regulations.

Air Monitoring and Control

EHP1 assistance to the air monitoring and control working group will focus on

- data quality and reliability issues, and
- communicating air quality information to the public.

[Note: activities of the air monitoring and control working group related to the Ampellum plant will be addressed by the EAPS Project. Examples include 1) assistance in ensuring agreement between Alba EPA and Ampellum regarding the validity and interpretation of air monitoring and stack emissions data, and 2) linking of measured air data with plant operations and other environmental measures.]

4. Program evaluation [October-November, 1996]

This activity would include full program evaluations with each working group in both Zlatna and the second location to be determined. In addition, the contractor will be responsible coordinating with the working groups in Zlatna for follow-up KAP surveys for the lead exposure and OHS activities, as well as a follow-up blood lead survey, to determine program impact since the initiation of activities in June 1994.

5. (A) Assistance in initiating an occupational health and safety demonstration activity at a second site [September 1995 - December 1996]

Introduction to Tasks 5A and 5B:

Under Tasks 5A and 5B, the contractor will provide assistance to Romanian counterparts in initiating occupational health/safety and community lead exposure reduction activities at a second site, which will be determined in consultation with USAID/Romania and the ENI/EEUD/ENR Romania backstop. It is anticipated that counterparts from the established working groups in Zlatna will play a key role in setting up similar working groups at the new location and applying lessons learned. Thus, it is anticipated that one of the key roles for the contractor will be to provide "training of trainers" to the Zlatna-based counterparts.

Sub-tasks for Task 5A include:

- a. Providing technical assistance to the Alba Judet Sanitary Police and Worker Safety Inspectorate in assisting their counterparts in another Judet to establish a local working group at a second site and develop a practical plant health and safety plan. The plan will need to clearly define the roles and responsibilities of plant management personnel, plant health and safety workers, the plant doctor, and the Ministry of Health organizations including the local Sanitary Police as well as the Center for Medical Research and the School of Medicine and Pharmacy in Cluj.
- b. Identify, procure and ship personal and work place monitoring equipment which will support the training program and the implementation of the health and safety plan.
- c. Adapt and present an on-site 3-6 day health and safety personnel training workshop which integrates the use of personal protective equipment, work place monitoring equipment and administrative actions to control hazards.
- d. Promote the use of health and safety record keeping systems developed for Zlatna.
- e. Adapt worker education materials developed for Zlatna to the new site.
- f. Assist the working group in getting plant management commitment to the occupational health and safety plan.

**5. (B) Demonstration of Lead Exposure Reduction at a Second Site
[September 1995 - December 1996]**

Sub-tasks for Task 5B include:

- a. At the same site determined for Task 5A, provide technical assistance to local officials in establishing a lead exposure working group based on the Zlatna model and using key participants from the Zlatna working group to inform this process. This will also involve communication and coordination with the Center for Medical Research in Cluj, which will be building upon its work in Zlatna for this application at a second site.
- b. Provide technical assistance and oversight in the design and implementation of a childhood blood lead study in the selected site, with associated environmental lead sampling. This will provide baseline information for the development of a health education and social marketing program, and it will also identify children at risk.
- c. Provide technical assistance and oversight in the development of a community-based, public health education and social marketing program to educate both parents and children regarding the source and potential health effects of exposure to lead and associated contaminants and to promote techniques and strategies for reducing exposure.
- d. Adapt Zlatna educational materials to new site which will support implementation of the health education and social marketing program.
- e. Coordinate lead activity with the worker health and safety activity of Task 5A as appropriate.

6. Activity management [July, 1995 - December 1996]

The contractor will provide U.S.-based overall activity management and administrative backstopping. The task includes developing individual activity scopes of work; recruiting and contracting consultants as necessary; conducting team planning meetings as required; providing technical direction and quality control; providing administrative support for procurement actions including getting bids as necessary and getting USAID contract's office approval; providing travel arrangements; and managing report preparation and printing. In addition, the contractor will be responsible for liaison with G/PHN/HN, ENI/EEUD/ENR and

USAID/Romania for consultant approvals, country clearance and review of draft reports.

As part of the management task, the contractor will be responsible for developing an 18 month work plan for this activity, to be delivered in draft to G/PHN/HN, ENI/EEUD/ENR and USAID/Romania for review within four weeks of the award of this delivery order amendment. This initial version of the work plan will be modified after the initial visit to the second site (see Tasks 5A and 5B), again with the draft revised work plan to be delivered to G/PHN/HN, ENI/EEUD/ENR and USAID/Romania within four weeks of such a visit. In addition, the work plan will be reviewed at the mid-point of activities, approximately in February 1996, and necessary modifications proposed. The contractor will have responsibility for informing G/PHN/HN, ENI/EEUD/ENR and USAID/Romania of any proposed modifications to the work plan.

The work plan will include indicators of progress to be tracked during work plan implementation, benchmarks to be attained at specific points in the work plan, and the relationship of these outcomes to the Strategic Objectives of USAID/Romania.

Table 1 provides a summary of the environmental and occupational health activities to be pursued in Zlatna over the extension period of June 1995 - December, 1996 . Those for which the contractor under this scope of work would have principal responsibility are designated as "R" under the column "EHP1." Participation by EHP1 (P) in other activities as noted in Table 1, would be required for the efficient integration of USAID resources from other programs.

TABLE 1

PROPOSED SUPPLEMENTAL ENVIRONMENTAL HEALTH ACTIVITIES IN THE
ZLATNA/ALBA JUDET REGION AND COORDINATION FRAMEWORK

R = RESPONSIBLE; P = PARTICIPATES; I = INFORMED

ACTIVITY	EHP1	EHP2	USEPA	ETP	USPC	EAP
1. Coordination of Zlatna/Alba environmental health activities among EHP1/ 2, USEPA, ETP, USPC & EAPS.	R	P	P	P	P	P
2. Environmental data analysis, interpretation and application workshop including public outreach methods and techniques.	R	I		P		I
3. Technical assistance and support for three working groups established during the first year of EHP1.	R		P?	I		P
4. Redo KAP survey, blood lead survey & program evaluation in 6/96.	R	P	?	P	P	P
5. Extend Occupational Health & Safety and Lead Exposure Reduction to second site.	R	I		I		I
6. Soil lead clean up demonstration workshop in Zlatna with community members invited from Copsca Mica and Baia Mare.	P	I	R	P	P/I?	I
7. Development of community-based soil lead cleanup program with community members invited from Copsca Mica and Baia Mare.	P	I	P	R	I	I

8. Environmental Action Plan workshop with three working groups and community members from Copsca Mica and Baia Mare.	P			R		I
9. Facilitation of development of CME course in lead exposure, toxicology and treatment and development of lead intoxication training video.	P	R?	P?			I
10. Small business development of milk products store in Zlatna.	I			I	R	

R = RESPONSIBLE; P = PARTICIPATES; I = INFORMED

- EHP1 = Extension of one year EHP Zlatna Activity begun in June 1994.¹
- EHP2 = EHP Curriculum Development Activity begun in 1995.²
- USEPA = U.S. Environmental Protection Agency.
- ETP = Environmental Training Program.
- USPC = U.S. Peace Corps Volunteer in Alba Ilia who works on small business development.
- EAP = Environmental Action Program Support Project.

III. REPORTING

The contractor will be responsible for bimonthly reports to be delivered to USAID/Romania, ENI/EEUD/ENR and G/PHN/HN/EH, beginning on the first day of the third month of this amendment.. These reports will summarize:

¹ Represents the continuation of ongoing efforts by EHP, funded through a buy-in from ENI/EEUD/ENR.

² The designation "EHP2" refers to those environmental health activities (principally in curriculum development) being pursued by EHP under the ENI/HR/HP buy-in to the project. EHP2 activities are being implemented in conjunction with Romanian counterparts in Cluj.

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- all activities of the contractor during the reporting period related to progress on each task;
- working group activity;
- coordination with other related USAID activities;
- any outstanding action items for USAID.

The contractor will also prepare a draft final report to be delivered for review to USAID/ Romania, ENI/EEUD/ENR and G/PHN/HN/EH one month prior to the completion date of this delivery order. Three weeks after submission of the draft report, five copies of the final report will be submitted to each of USAID/Romania, ENI/EEUD/ENR and G/PHN/HN/EH, incorporating any comments received.

IV. ROLES AND RESPONSIBILITIES

While the Contracting Officer's Technical Representative (COTR) will maintain ultimate authority for directing the contractor in the tasks to be executed in this delivery order, the contractor will be expected to seek guidance from the designated responsible parties at USAID/Romania (the USAID representative or his/her designee), ENI/EEUD/ENR (the Romania backstop), and G/PHN/HN/EH. The USAID parties will be expected by the contractor to coordinate their own input to the contractor, such as responses, if any, to the bimonthly contractor reports.

V. COMMODITIES

In support of the Tasks specified in article II, the contractor will supply the following commodities (quantities in parentheses where applicable):

- organic vapor analyzer
- face masks with filter cartridges and aerosol prefilters (100)
- spirometer for respiratory function testing
- disposable items as required for occupational health and safety monitoring
- disposable items as for occupational health and safety plan implementation
- computer with printer and associated peripherals for production of health education materials
- computer with printer for data analysis
- printing of health education materials
- disposable items as required for blood lead testing
- journal subscriptions and other information resources as required