
SUMMARY REPORT AND COMMENTS

on a review of the

Palmerton Scientific Symposium

sponsored by:

Palmerton Environmental Task Force

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The Palmerton Citizens For A Clean Environment

In Response To Task Schedule #10

AUTHORIZATION

The following report has been prepared in response to a request from the Palmerton Citizens for a Clean Environment (PCCE) for a review of the July 29, 1994 Palmerton Scientific Symposium, in accordance with Task Schedule #10, issued August 3, 1994. The observations and conclusions contained herein are those of the MKA Project Team.

Task Schedule #10 requests that the MKA Project Team perform the following tasks:

1. Review the NEIC study and provide a written report to PCCE which would be suitable for release to the press. This task should be completed by 8/31/94.
2. Provide written comments from MKA on both the public and private sessions of the symposium, also suitable for release to the press. Please distinguish review pertaining to the public session from comments by Dr. Bruns on the private session. If possible this should be completed by 8/10/94.

REVIEW AND COMMENTS ON THE PALMERTON SCIENTIFIC SYMPOSIUM

REVIEW

The following review is not intended to serve as an exact chronological recapitulation of the entire 8 hour symposium, but rather will serve as a general overview of the proceedings, placing emphasis on important technical issues, and those issues that relate directly to the overall significance of the symposium. A section offering comments on the Symposium will follow.

The Palmerton Scientific Symposium, sponsored by the Palmerton Environmental Task Force (PETF), was held at the West End Fire Company on July 29, 1994. The overall goal of the symposium (as stated on the official symposium program) was to formulate solutions for a responsible end to the Superfund Program in Palmerton. As stated in the official symposium program: "The event is designed to provide a community-based forum to review and evaluate the available data on the effects of heavy metals on public health (particularly children) and the environment, and based on this analysis, formulate community-based decisions on the appropriate actions for the abatement and management of heavy metals in the environment."

The Symposium began promptly at 8:00 a.m., with a few brief introductory remarks by Palmerton Borough Manager and PETF Moderator, Roger Danielson. Mr. Danielson welcomed the participants, introduced the Symposium panelists, and gave a brief historical overview of the Palmerton Environmental Task Force (PETF). According to Mr. Danielson, the PETF was formed at the request of Horsehead Industries President Dr. David O. Carpenter, Ph.D., before a meeting of the Carbon County Commissioners. The Carbon County Commissioners then drafted a letter to the Palmerton Borough Council endorsing Dr. Carpenter's suggestion, which provided the final impetus for the groups formation.

Dr. Brian Murphy, Ph.D., began his introductory remarks by welcoming the participants and then outlining the ground rules for timing panelist presentations and asking questions. Panelists were permitted to ask questions at the end of each presentation, and the general public would be provided two question and answer periods during the day; one immediately preceding lunch, and one after all panelist presentations were completed. Dr. Murphy defined the issues at Palmerton as components of three main categories:

1. Different people within the community have different values. Some individuals place more value on ecological or environmental conditions, while other individuals are more concerned with economic conditions.
2. There are different perspectives on EPA's Superfund policies. These include some technical issues such as different methods for conducting risk assessments.
3. There are issues that are purely technical and can be resolved by developing facts based upon a review of existing studies or by conducting additional studies.

Dr. Murphy emphasized that the Palmerton Scientific Symposium would not be able to resolve all the issues in Palmerton, but could make its greatest contribution by concentrating on those issues that can be resolved through the development of facts. He also addressed the issue of credibility, which was raised by one of the questions submitted to the facilitator in advance of the Symposium. Dr. Murphy stated that his firm, Gradient Corp., had done work for Horsehead Industries in the past, but that he was not personally a part of those projects; and that he and his firm did much more work for EPA than they did for Horsehead Industries. Consequently, he asserted that neither he nor any of the other expert panelists would compromise their scientific credibility. Furthermore, he suggested that it would be unproductive for the Symposium participants to focus on the issue of credibility.

Dr. David O. Carpenter, Ph.D., President of Horsehead Industries began his presentation at approximately 8:15 a.m.. Dr. Carpenter had a prepared speech to read (presumably the same as the published copy of his remarks made available to Symposium participants - which is included with this report as Appendix A), but did not read directly from his notes until he was made aware that he was critically short on time. He then attempted to quickly cover several key comments and concluding statements, read directly from his prepared notes, so his presentation ran at least 5 minutes past the allotted time.

Dr. Carpenter's presentation, though informative and important to understanding the overall significance of the Symposium, did not provide any technical or scientific contributions. He started with the appropriate commendations for Symposium organizer Dolores Ziegenfus, and lamented her absence due to a health emergency. He expressed that the Company was happy to participate in the Symposium. He detailed the historic importance of the industry to the development of Palmerton, and the success of the United States during the First and Second World Wars. He expressed a sentimental fondness for the community, recounting the pleasant experiences he and his family have enjoyed during their years in residence. He detailed how the industry has remained responsive to the needs and requests of the community, by establishing programs like Neighbor Helping Neighbor, free blood lead testing for children at local hospitals, and expressed a commitment to continuing and expanding the Company's contribution. He provided a brief overview of the Superfund status of the industry and the community, and was critical of the State and Federal agencies for taking 15 years to act on their own recommendations to recontour and vegetate the Cinderbank.

Dr. Carpenter strongly stated that zinc contamination and drinking water quality are not problems in Palmerton. He also stated that Palmerton is a healthy community, with PaDER air monitoring data indicating that Palmerton has some of the best air quality in the State, and are in compliance with the National Air Quality Standards by wide margins. He then criticized the Superfund program and Superfund policy, calling the Superfund status of the community a "Stigma on Palmerton". He emphasized the many significant environmental improvements that ZCA and HRD have completed in the last few years, contrasting current conditions with a time when airplane pilots in route to Philadelphia could navigate by the smoke from Palmerton. He also stated that the Company is not the enemy and will continue to be a partner for environmental progress. Dr. Carpenter concluded his presentation, after several reminders by Dr. Murphy that he had expended his allotted time, by once again expressing his gratitude to The PETF, and especially to Dolores Ziegenfus for organizing the symposium, and for inviting the Company to participate.

Mr. Frederick N. Mac Millan, EPA Region III Remedial Project Manager, began his presentation with a promise to put the Symposium back on schedule by completing his remarks in less time than originally allotted. Mr. Mac Millan provided a brief overview of EPA activity in Palmerton; which started in 1975 when EPA ordered the New Jersey Zinc Company to reduce their air emissions. He then provided an overview of the history of Palmerton's Superfund status, and how EPA had delineated the four Operable Units (OU's). OU #1 is Blue Mountain, OU #2 is the Cinderbank, OU 3# is soil and dust contamination in the surrounding communities of the Palmerton Valley, and OU #4 is contamination of surface and ground water. Mr. Mac Millan then quoted contaminant concentration levels for zinc, lead and cadmium from studies conducted by R.E. Wright and CDM Federal Programs Corp. Based upon these and other reports, such as the ATSDR and NEIC studies, it is the opinion of EPA that there is a risk to human health (particularly children) and the environment from lead and cadmium contamination in Palmerton. He concluded his presentation by stating that EPA has no other interests in the community of Palmerton than to assure that human health and the environment are protected in accordance with Congressional mandate; and that the time frame for achieving that goal is likely to be measured in a few years, as opposed to a few months. The Superfund status of Palmerton will not end until EPA has fulfilled their responsibilities.

At approximately 8:45 a.m., Dr. Susan Garszczynski, Director of Professional Services at Palmerton Hospital, began her presentation of the health history of Palmerton, and the results of blood lead analysis conducted at Palmerton Hospital. In 1991, Palmerton Hospital provided blood lead testing for 247 individuals, 109 of which were less than 6 years of age. The sample analysis was conducted by Smith Kline Beecham, using Graphite Furnace Atomic Adsorption Spectrophotometry (the industry standard). The results are as follows:

Males less than 6 years of age: 38% <5ug/dL
 48% 5-9ug/dL
 12% >10ug/dL

Females less than 6 years of age: 68% <5ug/dL
 31% 5-9ug/dL
 1 individual with 11ug/dL

Blood lead testing was also conducted on 32 children (20 males, 12 females) in 1993-1994. The combined results are:

9 individuals (28%) <5ug/dL
18 individuals (56%) 5-9 ug/dL (mean 6.2)
5 individuals (15%) with 10ug/dL (all >11ug/dL)

Dr. Garszczynski completed her remarks by stating that based upon the results of blood lead testing conducted at Palmerton Hospital, and her experience with patients treated at Palmerton Hospital, overall the Palmerton community is healthy.

Dr. Mike McGeehin, Ph.D., MSPH, Chief of the Agency for Toxic Substances and Disease Registry's (ATSDR) Health Investigations Branch, provided an overview of the ATSDR "Biological Indicators of Exposure to Cadmium and Lead, Parts I and II, Palmerton Pennsylvania", studies. Dr. McGeehin began his remarks by outlining the objectives of the ATSDR studies:

1. To compare lead and cadmium levels in the target community of Palmerton, and the comparison community of East Jim Thorpe.
2. To determine factors (indicators) influencing exposure levels to lead and cadmium (measurements of blood lead and urine cadmium) in the two communities.

Dr. McGeehin very explicitly stated that the ATSDR studies had no other objectives, and were not intended to function as a health study. Some of the highlights of the ATSDR studies are:

1. 23% of the Palmerton children under 6 years of age that were tested had blood lead levels greater than or equal to 10 ug/dL (micrograms per deciliter).
2. 27% of the East Jim Thorpe children under 6 years of age that were tested had blood lead levels greater than or equal to 10 ug/dL.
3. Recent studies indicate that the National average for children with blood lead levels greater than or equal to 10 ug/dL is 8-9%.
4. Jim Thorpe had higher levels of lead in tap water and lead based paint.
5. The indicator most predictive of high blood lead levels is exterior porch dust.

6. ATSDR's statistical model shows that within Palmerton, for every 1000 meters distance from the smelter, there is an 18% reduction in blood lead levels. Thus on average blood lead levels are highest in close proximity to the smelter.
7. Urine Cadmium levels were much higher for adults in the Palmerton test population.
8. The two indicators most predictive of elevated urine cadmium levels are smelter work, and smoking.

Dr. Robert Bornschein, Ph.D., Professor of Environmental Health at the University of Cincinnati, and technical assistant to the Palmerton Environmental Task Force (PETF), provided an overview of lead exposure pathways and blood lead studies conducted at other sites. According to Dr. Bornschein, the National average for blood lead is about 3.7 ug/dL. 1991 studies conducted by ATSDR indicate that the average blood lead concentration in Palmerton was 6.5 ug/dL. Assuming that blood lead levels in Palmerton are consistent with the National trend of an 8% reduction per year (resulting from a reduction in the use of leaded gasoline and lead based paint), Dr. Bornschein stated that he would expect to find the current blood lead levels in Palmerton to be around 5 ug/dL; only slightly higher than the National average. The Center for Disease Control recommends the following action for children with elevated blood lead levels:

>20 ug/dL - medical treatment to immediately reduce blood lead levels.

>15 ug/dL - investigation of the home environment to determine the lead exposure pathways.

>10 ug/dL - community education is recommended to reduce exposure levels.

Dr. Bornschein provided a comparison between Palmerton and other lead contaminated sites. These include: Kellogg Idaho, Leadville Colorado, Baltimore Maryland, Boston Massachusetts, and Cincinnati Ohio (Kellogg Idaho is a smelter community and Superfund site, Leadville Colorado is a mining community and also a Superfund site; Baltimore, Boston, and Cincinnati were all studied as part of the Urban Soil Lead Abatement Demonstration Project - aka. The Three City Study). A summary of the percentage of study participants within these communities with blood lead levels greater than or equal to 10 ug/dL is provided below:

Kellogg, Idaho	1974	100% (65.6 ug/dL average)
	1989	56% (11.3 ug/dL average)
Leadville, Colorado	1987	40% (8.7 ug/dL average)
	1991	8.2% (4.8 ug/dL average)
Baltimore, Maryland	1989	59.1%
Boston, Massachusetts	1989	71.1%
Cincinnati, Ohio	1989	51.6%
East Jim Thorpe, Pa.	1991	27% (6.5 ug/dL average)
Palmerton, Pa.	1991	23% (7.0 ug/dl average)

Dr. Bornschein presented some curves that illustrate the relationship between environmental lead contamination levels and blood lead levels. Compared with curves generated at other Superfund sites, he stated that curves from Palmerton (based upon studies conducted in 1991 by ATSDR) are more similar to mining sites than smelter sites. The significance being that it is generally accepted that the contribution of lead contamination from smelter emissions to blood lead levels is greater than the contribution of lead contamination from mine wastes.

Dr. Bornschein also graphically presented some flow charts representing potential exposure pathways that contribute to elevated blood lead levels. His models identified the potential contributions of lead contaminated media such as dust, paint, soil and tapwater to elevated blood leads levels. He attributed much of the lead contamination in dust and soil to current and historic emissions, as well as lead based paint.

Mr. Richard E. Wright, M.S.P.G., President of R.E. Wright Associates, Inc. (REWAI), provided a summarization of risk assessment studies his firm conducted at Palmerton. (A written outline of Mr. Wright's presentation was made available and has been included with this report as Appendix B) R.E. Wright Associates first worked for Gulf and Western in 1975 or 1976, during closure of the Friedensville Mine, and started working on the Palmerton Superfund site in 1984. Since that time, R.E. Wright Associates, Inc., has:

1. negotiated and developed a scope of work plan for a remedial investigation/feasibility study (RI/FS),
2. conducted 2 phases of soil sampling to evaluate the extent of contamination,
3. conducted garden studies used toward development of the risk assessment,
4. developed a risk assessment based upon existing EPA guidance,
5. negotiated a Response Action Plan to delineate areas where lead is >500 ppm in soil and 100 mg/m² in dust,
6. submitted a draft Response Action Plan report, response pending from EPA,
7. submitted a revised Risk Assessment study to EPA.

According to Mr. Wright, the original risk assessment (submitted as: "Palmerton Zinc Off-Site Study Area Draft of Remedial Investigation and Risk Assessment - REWAI Project 8498 - Volume II, Chapters 5-6 - January 27, 1988"), was not requested by EPA as part of the Administrative Order by Consent. The 1988 Risk Assessment study, which concluded: "...There is no evidence that cadmium, lead, and zinc are currently having a significant effect on human health in the Palmerton area"; was not approved by EPA (reference is made to correspondence between EPA Remedial Project Manager Fran Burns and Mr. John McAleese, dated July 10, 1991).

On April 26, 1994, REWAI submitted a revised Risk Assessment to EPA. According to Mr. Wright, the revised Risk Assessment included additional information from the REWAI January 1994 final field trip report (some additional sampling was conducted in 1993), all EPA studies, ATSDR studies, and Palmerton Hospital studies. In addition, as directed by EPA comments to the initial Risk Assessment document (reference is made to correspondence between EPA Remedial Project Manager Fran Burns and Mr. John McAleese, dated July 10, 1991), REWAI followed EPA's 1989 Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation Manual (Part A) Interim Final, EPA/540/1-98-002. The 1994 Risk Assessment concluded: "The potential for an increased risk of developing cancer from inhaling airborne dust containing cadmium or for ingesting soil, dust, water or food containing lead is a maximum of a few chances per 100,000 for persons living close to the plant. However: There is currently no evidence that the cadmium, lead and zinc, or other potential pollutants from the plant, are having a significant effect on human health in the Palmerton area."

Mr. Wright defended the revised REWAI Risk Assessment, and stated that, based upon actual sample data, ingestion rates are about 50% of what the model assumes. Further, he stated that more extensive and more recent environmental data was not available due to a reluctance by the community to submit to additional environmental sampling (only 3 out of 35 homes granted approval for sampling water, dust/soil, and children's blood). Consequently, the Extent of Contamination study had to rely on an analysis and interpolation of previous and available data.

Immediately following Mr. Wright's presentation, several questions and comments were raised by members of the panel. Since Mr. Wright did not prepare the Risk Assessment document, he had to defer technical questions to Dr. Richard Greeley, primary author of the Risk Assessment report, who was seated in the audience. Dr. Mike McGeehin, Branch Chief of the Health Investigation Branch at ATSDR, stated that Mr. Wright's comments about the ATSDR study inaccurately represented what ATSDR's report actually said. U.S. EPA Region III Senior Toxicologist, Dr. Reginald Harris, commented that REWAI Risk Assessment Result #8 ("Only 4 percent of the 283 children tested in the Palmerton Hospital study had blood lead levels between 10 and 20 ug/dL."), indicates that there is an unacceptable risk to human health from lead exposure in the Palmerton area.

U.S. EPA Chemist Ms. Sharon Harper provided an overview of methods used for lead paint testing. Ms. Harper discussed the various criteria for selecting the appropriate analytical methodology. The data quality objectives process directs the test methodology selection process. The methodology for evaluating lead paint in housing should be based upon established parametric standards. For example, 1.0 mg/m² or 5000 ug/g is the 1990 U.S. Department of Housing and Urban Development action level for lead paint abatement. By contrast, new paint would typically have a lead concentration of about 600 ug/g (CPSC 1978). (Editors note: Consequently, CDM Federal Programs Corporation used an XRF reading of 0.9 mg/cm² to indicate the presence of lead based paint during their sampling of environmental media in Palmerton and Jim Thorpe. It may be significant to note that at EPA's request, CDM Federal Programs Corp., used "The Butte-Silver Bow Department of Health Sampling Protocol" dated October 1990, that was co-authored by the University of Cincinnati and the Butte-Silver Bow Department of Health). Although techniques such as Atomic Absorption Spectroscopy and Inductively Coupled Plasma are the most sensitive analytical techniques, they are not portable, and are more expensive tests to perform. Consequently, they may not be the most appropriate methodologies for evaluating the need for lead based paint abatement.

There are several less expensive portable methods that reliably detect lead based paint at or below levels recommended for abatement. These include Colorimeter tests, RTI Quantitative test kits, and XRF. Colorimetric tests are problematic, especially if quantitative results are required. XRF (used by EPA) is a reliable, portable quantitative method that can be applied at different energy levels to provide different levels of penetration. For example, L-Shell XRF has a lower energy level than K-shell XRF. But care must be taken to calibrate the XRF analyzer so that it penetrates to the desired depth, or it may pick up on other sources of lead, such as lead pipes behind the wall. Although the need for frequent calibration can make XRF field analysis problematic, it has been determined to be accurate enough for laboratory applications.

Following Ms. Harper's presentation, Dr. Brian Murphy, asked about the accuracy of the X-Met XRF analysis used by CDM Federal Programs Corp. (to detect lead based paint for the "Palmerton Zinc Site Second Draft Field Trip Report", and used by U.S. EPA to evaluate the presence of lead based paint for the ATSDR "Biological Indicators of Exposure to Cadmium and Lead, Part I, Palmerton, Pennsylvania" report). Ms. Harper declined to comment on that specific X-Met analyzer, but offered that there is the potential that L-shell XRF may not be reliable for subsurface lead based paint, depending on the angle of penetration. This may possibly explain why there were such large differences between XRF lead paint values, and AA lead paint values in these studies.

Dr. Mark Farfel, Assistant Professor of Hygiene & Public Health at John Hopkins University; and Director of the Lead Abatement Research Program at the Kennedy Krieger Institute, presented a brief overview of the Three City Lead Study (aka. the Urban Soil Lead Abatement Demonstration Project); testing methodologies; and a review of the effectiveness of various methods of remediation. Mr. Farfel reviewed his experiences with lead exposure abatement efforts in Baltimore Maryland. The communities where Mr. Farfel conducted his studies were urban, low income neighborhoods, with most houses constructed before 1940.

Dr. Farfel stated, and it was clearly evident from his photographs, that there was very little soil present in the communities where his studies were conducted. The primary source of lead exposure in his study area appeared to be lead based paint, with as many as 800 clinical cases of children with blood lead levels greater than 30 ug/dL.

Much of Dr. Farfel's presentation centered around common problems and proven techniques for remediating lead based paint in residential environments. He discussed the do's and don't's of lead paint removal, and suggested some possible containment measures for areas where removal was not feasible or necessary (such as covering friction surfaces on casement windows). Lead based paint also caused contamination of interior and exterior dust, and the potential for recontamination was addressed repeatedly. Dr. Farfel also suggested that lead contaminated dust, created during lead paint removal could cause a temporary increase in blood lead levels, immediately following remediation.

Senior Research Agronomist for the U.S. Department of Agriculture, Agricultural Research Service's Environmental Chemistry Lab, Dr. Rufus L. Chaney, Ph.D., gave a presentation on Soil Science Issues and Bioavailability. Dr. Chaney began his presentation by suggesting that lead contamination resulting in elevated blood lead levels was a much greater problem in the recent past, both nationally and globally, than is currently being experienced in Palmerton. In addition to the ubiquitous use of lead based paint, Dr. Chaney also attributed historical elevated blood lead levels to leaded gasoline and metallic cans. To reinforce his point, Dr. Chaney provided graphic representations of blood lead studies conducted during the 1970's in New Guinea and Sydney Australia, which had blood lead levels averaging from 5 ug/dL to 25 ug/dL respectively. He stated that blood lead levels have declined significantly since the late 1980's due to changes in the manufacture of metallic cans, and the reformulation of gasoline to eliminate nearly all tetraethyl lead.

In term of the bioavailability of lead contaminated soil, Dr. Chaney stated that the primary exposure pathway in terms of risk is ingestion, with the rate of intestinal assimilation varying from compound to compound (ex: Lead Oxide vs. Lead Sulfide, etc.). According to Dr. Chaney, the nutritional status of the individual is the single most important factor determining assimilation rates for lead. This is because metals such as lead are more soluble under acidic conditions, and eating regularly tends to reduce the acidity. An individual who has been fasting, or is severely undernourished may assimilate as much as 60% to 80% of the lead ingested. Certain types of foods, such as foods high in calcium and dietary fiber (whole grain bread is an example) are useful for further reducing lead ingestion rates. Also, because soil particles bind metals and reduces solubility, the contribution of lead contamination in soil to blood lead levels is not directly proportional to the quantity ingested. Instead, studies have shown that there is a point of diminishing returns, where additional quantities of lead contaminated soil only result in incremental increases in blood lead levels. In Dr. Chaney's opinion, remediation of lead based paint needs to be addressed for a cleanup in Palmerton to be successful. He stated that he collected a soil sample in Bowmanstown with a higher concentration of lead than any sample he collected in the Palmerton area. He also said that Palmerton's average blood lead level of 6.9 ug/dL is acceptable.

In terms of vegetative growth and agricultural productivity, Dr. Chaney stressed the importance of applying soil amendments that are high in iron, phosphates and lime. These tend to further bind the lead contamination to the soil, reduce the acidity (and solubility), and minimize chlorosis (yellowing of plant tissues due to a lack of chlorophyll). Dr. Chaney said that the local farmers should be compensated for the additional soil amendments they need to apply to maintain profitable agricultural productivity.

Following Dr. Chaney's presentation, there was a mid-day question and answer session for the general public. Lunch was served after the question and answer session.

After lunch, Dr. Michael Ketterer, Ph.D., Assistant Professor of Chemistry at John Carroll University in Cleveland Ohio initiated presentation of the Hazardous Substances Source Identification Study conducted by the U.S. EPA National Enforcement Investigations Center (NEIC) in Denver Colorado. Dr. Ketterer, one of the principal investigators of the study, provided a brief outline of the study methods and their conclusions. According to Dr. Ketterer, samples were collected from the East Plant, the Cinderbank, the West Plant, the Appalachian Trail area, and at residences in the Palmerton area, and analyzed. Residential sampling included house dust, attic dust, litter and soil, and tap water.

Three types of analyses were performed, including: Lead Isotope Ratios, with geochemistry, and environmental source identification applications; Elemental Composition - Concomitant Tracer - Based Methods; and Individual Particle Analysis. The results of the three metal speciation tests were subjected to a battery of statistical analyses, and the data compared. According to Dr. Ketterer, the chemical signatures from the EAF dust recycling process, and historic smelter emissions are distinct, and the results of the three types of speciation tests correlate.

The results of the NEIC study indicate that current operations at the East Plant are contributing to airborne contamination which settles out contaminating house dust and soil. Airborne particulate matter tested had 25,000 ppm lead, 1,400 ppm cadmium, and 100,000 ppm zinc. It is the opinion of the study authors that although the plant appears to be in compliance with air quality standards when measured as a 3 month average, that ambient air quality standards are being exceeded regularly when compared with the 24 hour standards. Dr. Ketterer stated that the 2 air monitoring stations that are currently in use at Palmerton are not adequate for evaluating actual conditions, and that for a CERCLA site with the potential for generating fugitive emissions (Bunker Hill, Idaho was given as a comparison), it would not be unreasonable to have as many as 8 to 10 air monitoring stations at various locations throughout the Palmerton valley.

Analysis of soil and litter samples indicates that contaminant concentrations are much higher in surficial deposits such as litter than a few centimeters below in the soil profile. Since the R.E. Wright Extent of Contamination study only sampled soil, and did not sample litter, this observation suggests that the R.E. Wright study may have underestimated contaminant concentrations. Furthermore, in terms of risk assessment, contaminated litter is more accessible to human contact, and would therefore constitute a greater risk than contaminated soil.

Dr. Joe Lowry, Ph.D., Senior Science Advisor from the U.S. EPA National Enforcement Investigations Center in Denver Colorado, completed the presentation of the Hazardous Substances Source Identification Study, by providing additional technical reinforcement to the study's conclusions. According to Dr. Lowry, the results of the sample analysis are precisely what would be expected if, as the study concludes, the primary sources of contamination are historic emissions and current operations (as opposed to lead paint). For example, lead emissions from EAF dust recycling are considerably more radiogenic than lead sources from historic emissions or lead based paint. Also, the source of contaminated attic dust was found to be from historic smelter emissions, while house dust contamination was primarily attributed to current operations at the East Plant. This makes sense intuitively, since people regularly clean their houses, which would remove historic emissions, but attics typically go unattended for years. Furthermore, the contribution of lead based paint is easily distinguished by one of the tests, Elemental Composition - Concomitant Tracer - Based Methods, because lead based paint contains Barium and Titanium, as opposed to EAF dust which is high in Bismuth, and historic emissions which are high in Indium. Dr. Lowry also gave a brief overview of some of the statistical methods, such as factor analysis, used to compare the sample data.

Following Dr. Lowry's presentation, several of the panelists made comments or asked questions regarding the validity of the NEIC study. For example: Dr. Chaney questioned the comparison of contamination levels in litter and soil because of differences in the bulk density of the two sample media; Dr. Bornschein questioned the sampling protocol for the house dust analysis; and Dr. Murphy questioned the significance of the statement by Dr. Ketterer that emissions from the East Plant regularly exceed the Air Quality Standards on a 24 hour basis, by asserting that the facility has been documented to be in compliance with air quality standards based upon a three month average.

Following discussion of the NEIC study, EPA Region III Senior Toxicologist Dr. Reginald Harris provided an overview of risk assessment issues at Palmerton. First, Dr. Harris addressed why the REWAI Risk Assessment was unacceptable to EPA. These include:

1. The REWAI risk assessment assumed that the lead/cadmium ratios were about equal (1:1), while EPA studies indicate that they range from 10:1 to about 30:1.
2. REWAI's surface soil sampling protocol did not evaluate contamination levels in litter, which NEIC found to have substantially higher levels of contamination.
3. Much of the REWAI risk assessment relied on Dr. Dale Baker's garden studies. Dr. Baker's study only evaluated uptake of cadmium by romaine lettuce; lead uptake should also have been evaluated.
4. Furthermore, Dr. Baker's garden studies assumed that all garden plots would be treated with lime, which reduces the solubility of metals. This assumption may not be valid, leading to an under estimation of ingestion as an exposure pathway.
5. Arsenic levels are significantly higher in Palmerton relative to Jim Thorpe. The potential for health risks due to Arsenic exposure should have been included in the risk assessment study.
6. The REWAI risk assessment assumed a decreasing trend in airborne lead contamination. Due to the potential for air emissions from current operations, this assumption may not be valid.
7. REWAI applied the wrong model version (version 4 was used by REWAI, but they should have used models 5 and 6; see REWAI Figures 6-8, 6-9 and 6-10 in Appendix B) for blood lead levels in children.
8. REWAI incorrectly applied the 95th percentile when calculating the Reasonable Maximum Exposure (RME) level.

Furthermore, Dr. Harris stated that the ATSDR study was not applied appropriately. First of all, the ATSDR study was not a risk assessment or a health study. Second, a risk assessment study is not supposed to be used as a measurement of clinical health effects, but is instead supposed to identify the potential for adverse health effects before they are observed. Finally, Dr. Harris stated that the fact that 23% of Palmerton children, 6 years of age and younger, have blood lead levels in excess of 10 ug/dL is sufficient to demonstrate a health risk from lead contamination in Palmerton.

Ms. Judy Wink, Director and Chief Naturalist of the Carbon County Environmental Education Center discussed ecological conditions in the Palmerton area. Ms. Wink, who read directly from a prepared script, showed slides of recent efforts by HRD to revegetate Blue Mountain, interspersed with beautiful wildlife photographs that did not all appear to have been taken in the vicinity of the East Plant. She suggested, without presenting any hard scientific facts, that the ecological integrity of Blue Mountain was recovering. One apparent ecological aberration that she has observed on Blue Mountain since initiation of the revegetation program is an extraordinary over-abundance of grasshoppers. She suggested that this is probably a temporary imbalance, that will be followed by a sharp increase in animals that eat grasshoppers such as American Kestrels. Ms. Wink said "What happened in the past is past, we have to look to the future. From a wildlife biology viewpoint, I'd say we're on the way back."

PaDER Regional Director Ed Shoener talked about the success of the Blue Mountain revegetation program, and announced that DER has compromised on their earlier position (that the cinderbank should be capped in accordance with municipal solid waste landfill regulations) and has decided instead to allow the industry to simply recontour and vegetate the cinderbank in a manner similar to remediation of Blue Mountain.

Mr. Tom Janeck, Vice President of Environmental Services for Zinc Corporation of America (ZCA) spoke briefly about the industry's plans for remediation of the cinderbank, and disclosed that as of July 1994 ZCA has submitted to EPA a new work plan for additional air monitoring stations.

Mr. John Oyler, Reclamation Scientist for Horsehead Resources Development Company, Inc., provided a brief history and organizational overview of the Superfund program in Palmerton, and followed up with a status report on remedial activities for Operable Unit #1 (OU #1 is revegetation of approximately 1000 acres of Blue Mountain) and OU #2 (the Cinderbank). A printed outline of Mr. Oyler's presentation was made available to symposium participants, and follows the Remarks of David O. Carpenter, Ph.D., included with this report as Appendix A.

Operable Unit #1

Mr. Oyler stated that the revegetation of Blue Mountain is one year ahead of schedule, and it appears that it is now possible to complete the entire project by October 1994 rather than October 1995. The advanced schedule is due in part to the success of the program, especially the distribution system, and the fact that 229 of the original 1000 acres proposed for remediation already have the required woody stem count of 435 trees per acre.

Operable Unit #2

The original Remedial Investigation/ Feasibility Study, completed by ZCA in 1988 recommended:

1. Collecting and treating water flowing from Blue Mountain and the Cinder Bank prior to discharge into the Aquashicola Creek.
2. Partial regrading of the Cinderbank (for safety).
3. Establishing vegetative cover on the Cinderbank using techniques similar to those used for the revegetation of Blue Mountain.

EPA agreed in principle with the RI/FS for OU #2, but PaDER wanted the cinderbank capped in accordance with their regulations for closure of municipal solid waste landfills. These would have required:

1. Diverting all water from Blue Mountain around the Cinderbank.
2. Collecting and treating all water coming from the Cinderbank
3. Quenching all fires in the Cinderbank.
4. Grading and shaping the Cinderbank to gentle slopes.
5. Placing a 6-inch clay cap on the entire Cinderbank.
6. Placing an 18-inch layer of topsoil on top of the clay.
7. Vegetating the Cinderbank using techniques similar to those used for the revegetation of Blue Mountain.

These requirements were included in the initial Record Of Decision (ROD) for OU #2, but because of the high cost and the possibility of legal complications, EPA decided instead to commission Black and Veatch to conduct an Engineering Evaluation/Cost Analysis (EE/CA) of five alternatives. These included the DER alternative, the ZCA alternative, and three intermediate alternatives. The Black and Veatch EE/CA found the ZCA alternative to be acceptable, at a cost of \$28 million, compared with the \$217 million cost of the DER alternative. EPA had the ZCA alternative reviewed by the U.S. Office of Surface Mining (OSM), pertaining to the feasibility of leaving the fires in the cinderbank burn out on their own. OSM concluded that nothing needs to be done to isolate or extinguish the fires in the Cinderbank, as long as they are not posing a threat to human health or the environment.

The only remedial activity that was agreed upon by both ZCA and EPA in the original ROD is the collection and treatment of water draining off of Blue Mountain and the Cinderbank. ZCA conducted pilot-scale research on the feasibility of using constructed wetlands for water treatment, and the results of a Phase I and Phase II study were published. According to Mr. Oyler, the results of the Phase I and Phase II studies were favorable, with the remaining work consisting of optimizing flow rates, residence times, and determining land area requirements to treat the water coming from Blue Mountain and the Cinderbank.

In 1990, EPA indicated to ZCA that it was willing to issue a new ROD, but that additional studies would be required. The five additional studies are as follows:

1. Air monitoring of the burning areas on the Cinderbank to determine whether any health risks would occur if the fires were left to burn out on their own.
2. Three dimensional delineation of the burning areas.
3. Computer modeling of several different capping scenarios, ranging from the sludge/flyash/vegetation technique proposed by ZCA to the clay/topsoil alternative proposed by DER. The different alternatives were to be evaluated to predict the performance of the different types of materials in reducing infiltration and erosion.
4. The identification of the best possible locations for construction of trenches to contain the fires.
5. Conduct a study to investigate the feasibility of recycling the metals and energy values in the cinderbank. Techniques under consideration included heap leaching, biological leaching, use of the Flame Reactor, and use of the Waelz kilns.

According to Mr. Oyler, an amendment to the original Administrative Order by Consent was issued in December of 1991, requiring ZCA to conduct the 5 studies. With HRD providing managerial and technical support, studies 1 - 4 were let to GAI Consultants, Inc., and study 5 was let to Dames and Moore. Field work was initiated in the fall of 1992, but just as field work was about to begin, EPA agreed that computer modeling of the capping scenarios (study 3) could be dropped. The decision to drop the requirement for study 3 was made at the suggestion of PaDER Regional Director Ed Shoener, who was so impressed after touring the Blue Mountain project (OU #1), that he decided the same remedial action would be acceptable for the Cinderbank. Thus PaDER has dropped their earlier requirement that the Cinderbank be capped in accordance with their municipal solid waste landfill regulations.

The other 4 studies were completed as required, and have been submitted to EPA, the Army Corps of Engineers and PaDER for their review and approval. EPA has since requested that air monitoring of burning areas on the Cinderbank be expanded to sample for Benzene, Hydrogen Sulfide, and Sulfur Dioxide. The Cinderbank fires have been delineated, and it was determined that the fires extend for about 7000 linear feet (more than 1.3 miles). Since the fires in the Cinderbank have been delineated, it is now possible to locate the most effective places to construct cut-off trenches, and these have been identified. The first phase (technical feasibility) of study #5 (to determine the feasibility of recycling the metal wastes, and recovering the energy content of the Cinderbank), has been completed, but the second phase (economic feasibility) has not yet been started.

Following John Oyler's presentation, EPA Region III Remedial Project Manager Fred Mac Millan made some concluding remarks. Mr. Mac Millan suggested that the degradation of the environment in Palmerton is most clearly illustrated by the condition of Blue Mountain. Mr. Mac Millan indicated that EPA was very concerned with the potential for risks to human health and the environment as evidenced by the RCRA and Clean Water Act violations that the industry was cited with in 1993. However, he expressed confidence and satisfaction in the decision to use the same remedial action on OU #2 as had been applied to OU #1. He reiterated EPA's commitment to protect human health and the environment, and reaffirmed his earlier statement that the Superfund status of Palmerton would not be removed until that goal was satisfied.

During the question and answer session that followed the presentations, there was considerable interest in the findings of the NEIC study. J. Arthur Marvin, a member of the Pro Palmerton Coalition and the Palmerton Area Chamber of Commerce Ad Hoc Committee on the Environment expressed his lack of confidence in the NEIC study, and stated without qualification that the contribution of EAF dust to the contamination of Palmerton is not significant. According to Mr. Marvin, the source of lead contamination in Palmerton is the same as the source of lead contamination in East Jim Thorpe - Lead Based Paint. Mr. Peter Kern, another Palmerton citizen, repeatedly badgered NEIC Senior Science Advisor Dr. Joe Lowry by accusing the NEIC study authors of failing to publish important information that would demonstrate the uncertainty of their conclusions. Finally as if on cue, a Mr. Wolfgang Baum, Vice President of Pittsburgh Minerals & Technologies (who had reviewed the NEIC study for Horsehead Industries), charged that the use of purely chemical forms of analysis by the NEIC was fragile and dangerous. Instead, Mr. Baum stated, the NEIC should have used X-Ray Diffraction analysis, Optical Microscopy, and quantitative modeling. In his opinion, the application of particle analysis was biased.

Some final comments by EPA representatives disclosed that a draft Administrative Consent Order for OU #4 will be out later this year. A new risk assessment will be prepared by former EPA Region VIII Toxicologist Jim La Vale, which will focus on human health risks, and will consider all sources of contamination. An ecological risk assessment will be performed in conjunction with studies conducted as part of OU #4.

The Palmerton Scientific Symposium Public Session closed with some concluding comments by Symposium Facilitator Dr. Brian Murphy. Dr. Murphy once again thanked the PETF, and especially Ms. Dolores Ziegenfus, for organizing the symposium, and predicted that, based upon the public session proceedings, the executive session would focus on the following 10 issues:

1. Is there a current health concern due to lead exposure? If not a current concern, is there a future concern?
2. How does Palmerton compare to other communities with respect to lead exposure?
3. What are the sources and pathways of lead exposure?
4. What are the remaining major uncertainties?
5. Is cadmium exposure a cause for concern?
6. Do zinc and arsenic pose health concerns?
7. What issues should be considered in the risk assessment process?
8. What are the impacts on the local ecosystem/agriculture?
9. Can significant sources and pathways be prioritized and interventions recommended?
10. How does Palmerton develop the local infrastructure to implement and evaluate actions taken to reduce lead exposure?

COMMENTS

Overall, the public session of the Palmerton Scientific Symposium was a valuable experience for everyone that attended. The roster of panelists featured many of the more prominent individuals that have been involved with the Palmerton Superfund program to date, and also featured several pronounced experts who may have had a limited understanding of Palmerton, but could offer specific technical information and/or provide valuable insight into their experiences with other highly contaminated communities. An almost overwhelming volume of information was disseminated and, though less than comprehensive, a wide range of important issues were addressed.

Before commenting on specific issues discussed at the Symposium, it is important to consider why the Symposium was organized, and what it was intended to accomplish. According to the official Symposium schedule: "The event is designed to provide a community-based forum to review and evaluate the available data on the effects of heavy metals on public health (particularly children) and the environment, and based on this analysis, formulate community-based decisions on the appropriate actions for the abatement and management of heavy metals in the environment. The symposium's overall goal is to formulate solutions for a responsible end to the Superfund Program in Palmerton." Taken on its component parts, the purpose of the Symposium can be identified as what the event was designed to provide, and the overall goal.

The first component, what the event was designed to provide, implies that sufficient data was to be made available at the symposium for the community to review and evaluate the effects of heavy metal exposure on public health (particularly children) and the environment. It also implies that based on their perception of risk, the community would be able to make decisions regarding the appropriate actions for the abatement and management of heavy metals exposure. The potential for risks to public health from heavy metals exposure was one of the dominant

topics of the day. There appeared to be a strong consensus among the expert panelists that there are public health concerns at Palmerton; but there was still considerable disagreement by some experts, as to the degree of risk, and the source of the contamination. Since these areas of disagreement were well known prior to commencement of the symposium, it was presumptuous to suggest that the community would be provided with enough conclusive scientific data to make an informed decision about the most appropriate approach to remediation. Furthermore, the use of the term community-based implies that the Symposium was designed to assist the community in reaching consensus on what remains to be a very contentious issue: The need for an environmental cleanup.

The symposium's overall goal was, "...to formulate solutions for a responsible end to the Superfund Program in Palmerton". There is no question that the primary goal of the Symposium was to end the Superfund program in Palmerton, but in this context how does one define the term "responsible". If symposium participants were to place heavy emphasis on the remarks of Dr. David O. Carpenter, Ph.D., who asserted that Palmerton is a healthy community in which to live and work, with excellent quality drinking water, and some of the best air quality in Pennsylvania; if they were moved by complaints that the Superfund status is a STIGMA ON PALMERTON, something akin to "being a four-pound dog with a five-pound tick on its back"; then they would probably define "a responsible end" as having the community removed from the Superfund National Priorities List (NPL) as soon as possible. On the other hand, if the parents of a child with elevated blood lead levels (or any concerned parents) placed heavy emphasis on testimony given by Dr. Michael Ketterer, Ph.D. and Dr. Joseph Lowry, Ph.D., who outlined the findings of the NEIC study, then the phrase "a responsible end", would undoubtedly include a thorough re-evaluation of all exposure pathways, including lead based paint and current operations, development of a comprehensive risk assessment, a thorough evaluation of the most effective and permanent methods for minimizing exposure to heavy metals, and a plan for monitoring blood lead levels for many years into the future.

Possibly some insight into why the Symposium was organized, and what it was intended to accomplish can be gained by examining who was ultimately responsible for development of the Symposium. As stated on the official Symposium schedule, the Palmerton Scientific Symposium was sponsored by the Palmerton Environmental Task Force. However, as reported by Shirley Collins in the July 30, 1994 edition of the Times News, "Its thousands of dollars of expenses were borne by Horsehead and Viacom International, the company which bought Paramount Communications, which was the last corporation to operate the smelter."

Who is the Palmerton Environmental Task Force and what is its mission? As stated by Palmerton Borough Manager Roger Danielson during his opening remarks, the Palmerton Environmental Task Force was formed at the request of Horsehead Industries President David O. Carpenter, Ph.D. The official mission statement of the Palmerton Environmental Task Force is as follows:

"The duties of the Palmerton Environmental Task Force (PETF) will be to establish a constructive process to transcend the interests of all represented groups and individuals. A format is to be developed to gather information and present issues as they need to be addressed. Through mutual understanding and respect the committee members will remain committed to a process rooted in our common concern for the Palmerton Community.

The PETF will be informed by HRD, ZCA, EPA, PaDER, and the Department of Health on a timely basis of the ongoing activity at the Palmerton Superfund site and operable units; to be aware of the outcome of various testing and their results. PETF will hold the various parties accountable for accurate information and fulfillment of promises and objectives.

(continued)

Information will then be disseminated by PETF to the community and the news media by way of news releases and public meetings. The PETF will further act as an advisory panel to all parties concerned as well as a question and answer clearingbody. Citizens with pertinent questions may direct them to the PETF and be assured of a timely response from the appropriate entity."

While the mission of the Palmerton Environmental Task Force is not clearly stated, their mission statement seems to indicate a serious interest in controlling the flow of information related to the Superfund program at Palmerton. Although their membership roster includes one representative from the Palmerton Citizens for a Clean Environment (PCCE), the mission statement provides no indication that the organization was established out of concern for human health, that the organization as a whole supports a cleanup of historic contamination, or that they are interested in monitoring industrial activities to evaluate the potential for additional contamination and/or recontamination from current operations.

As far as the issue of credibility is concerned, Dr. Murphy's suggestion that it would be counterproductive to dwell on credibility is well taken. However, it should have been obvious to all participants that the Symposium was bought and paid for by Horsehead Industries and Viacom International. This was especially evident by the limited perspective offered by some of the expert panelists. It is not necessary for a scientist or expert panelist to compromise their credibility when they can be sufficiently persuasive by focusing on an analogous or peripherally related subject. For example, one panelist, Dr. Mark Farfel, presented his experience with lead exposure abatement by focusing on lead based paint remediation in an urban environment, while ignoring the fact that Palmerton was host to a primary zinc smelting operation for more than 80 years; at one time the largest zinc industry complex in the world. Palmerton is a strongly partisan community, and it was very obvious, based upon the topics discussed and the conclusions presented, which panelists were requested by the EPA, and which panelists were selected by the symposium sponsors.

Out of fairness and accuracy in reporting, it should be pointed out that EPA was well represented by their panel of experts, including: EPA Region III Director, Mr. Tom Voltaggio; EPA Region III, Eastern PA Section Chief, Mr. Fran Burns; EPA Region III, Remedial Project Manager, Mr. Fred Mac Millan; EPA Region III, Senior Toxicologist, Dr. Reginald Harris; EPA Chemist, Ms. Sharon Harper; and the two principal authors of the NEIC study, John Carroll University Assistant Professor of Chemistry, Dr. Michael Ketterer, and NEIC Senior Science Advisor, Dr. Joe Lowry. In addition, Dr. Mike McGeehin, Chief of the Health Investigations Branch at ATSDR, and PaDER Regional Director Mr. Ed Shoener were also in attendance.

The way Dr. Murphy defined the issues at Palmerton as components of three main categories: values, policies, and facts, is a common technique frequently applied to the practice of conflict resolution. As a conflict resolution tool it is often successful, and therefore useful, but within the realm of scientific inquiry it has limited application. This is because the boundaries between the three categories are interactive and therefore indistinct when applied to the issues. Even definitives such as facts are usually expressed relative to policies, which are usually based upon values. For example: The ATSDR "Biological Indicators of Exposure to Cadmium and Lead, Palmerton Pennsylvania, Part I report states that in 1991, 23% of Palmerton children 6 years of age and younger have blood lead levels of 10 micrograms per deciliter (ug/dL) or greater. This is obviously a fact, but it is based upon a policy decision that the population of interest is children ages 6 and under, and that the threshold for acceptable risk is 10 ug/dL. Although a considerable amount of scientific study (and hopefully facts) went into developing these policies, the contribution of values cannot be denied. Still, Dr. Murphy's council that the Symposium could make its greatest contribution by avoiding issues oriented toward policies and values, and concentrating on those issues that can be resolved through the development of facts seemed to be sound advice.

It is ironic that Dr. Carpenter immediately followed Dr. Murphy, in that his presentation disregarded Dr. Murphy's advice completely. Dr. Carpenter stated many facts that effectively expressed his sense of values, and blatantly attacked EPA Superfund policy, but offered no insight into the outstanding technical issues at Palmerton. In fact, Dr. Carpenter made several statements of fact that were either inaccurate or misleading. For example: Dr. Carpenter stated that PaDER's air monitoring data shows that the air quality in Palmerton is one of the best in the state and in compliance with all National Air Quality Standards. To the contrary, all of Carbon, Lehigh and Northampton Counties are classified by EPA as marginal ozone non-attainment areas. By comparison, there are at least 20 Pennsylvania Counties that are classified as being in attainment. In addition, past activities at the East Plant resulted in dozens of Notices of Violation from PaDER between February 1991 and March 1992, many of them for fugitive air emissions. Although it is evident that the industry has improved their operations considerably since that time, 7000 linear feet of the Cinderbank is still burning, contributing to uncontrolled air emissions, and every time the wind blows, contaminated dust from the East and West Plant properties becomes airborne. It may be true that based on a three month average, the Borough of Palmerton is generally within State and Federal air quality standards, but as Dr. Ketterer pointed out during his presentation of the NEIC study, if air quality were measured on a continuous 24 hour basis, the standards would probably be exceeded regularly.

Mr. Tom Dilazaro, from the Pennsylvania Department of Environmental Resources, Bureau of Air Quality was contacted on September 7, 1994 for additional information regarding air quality and air monitoring in the Palmerton valley. According to Mr. Dilazaro, PaDER operates a High Volume sampler on top of the ZCA Research and Development lab that samples every sixth day, a very predictable interval. In addition, PaDER has several types of air monitoring devices on Stony Ridge, northeast of the East Plant: two High Volume samplers that are wind activated; one is activated when the wind blows toward the East Plant, and the other one is activated when the wind blows away from the East Plant; and a random interval sampler that monitors particulate matter smaller than 10 microns in size (called a PM¹⁰ sampler). PaDER has no ozone monitoring stations in Carbon County, although ozone levels are probably very similar to those measured in nearby Lehigh and Northampton Counties. According to Mr. Dilazaro, the existing air monitoring stations have not indicated any exceedences for the air quality parameters that are currently being measured, including lead (which has a standard of 1.5 ug/m²) and PM¹⁰. However, he also stated that the air quality monitoring program currently in place in the Palmerton valley is not sufficient to determine if the industry is in compliance with the National Ambient Air Quality Standards.

Air quality monitoring at Palmerton is improving. For example, Mr. Dilazaro stated that the industry has installed 24 hour opacity monitors on two of the four stacks that exhaust the negative pressure bag houses, and plans to install 24 hour opacity monitors on the other two stacks in the near future. Data from the 24 hour opacity monitors is automatically transferred to a computer disc, that is submitted to PaDER to verify compliance. They also have installed multiple dust probes to monitor baghouse exhaust from kiln #3. If or when the new air quality standard for lead proposed by EPA goes into effect, the standard will be reduced from 1.5 ug/m² to 0.75 ug/m², and the industry will be required to install and operate a series of 24 hour High Volume air monitoring stations around the perimeter of the facility.

Dr. Carpenter also stated that zinc is not the issue. While his point that zinc is essential to human nutrition is well taken, it should be pointed out that at the concentrations found in Palmerton soils, zinc is phytotoxic. The phytotoxic condition that has resulted from over 80 years of zinc smelting in Palmerton has contributed to the complete defoliation of sections of Blue Mountain. According to HRD Reclamation Scientist John Oyler, "Metals levels are so high that microbial activity has ceased, and trees that have been dead for 20 or more years cannot decompose.... Following the death of the forest, severe soil erosion occurred, and to date it appears that between 12 and 24 inches of topsoil have been removed from the site."

Remediation of Metals - Contaminated Site Near a Zinc Smelter Using Sludge/Fly Ash Amendments: Herbaceous Species, Trace Substances in Environmental Health - XXII, 1988). If zinc is not an issue, what is the need for the Neighbor Helping Neighbor program? Why is it necessary to risk further surface and ground water contamination by spreading sludge and fly ash on Blue Mountain?

Dr. Carpenter recalled that the original Superfund listing in 1982 stated that Palmerton's water supply is contaminated. He asked the question "Is Water Quality an Issue?", and then went on to testify that because the source is an artesian aquifer hundreds of feet below the community, that originates in the Swanagunk Mountains of New York State, Palmerton enjoys one of the purest and most abundant water supplies in the State of Pennsylvania. As with his testimony on zinc, Dr. Carpenter was only telling part of the story. It may be true that Palmerton has a safe supply of drinking water, but that does not mean that the industry is not contributing to surface and groundwater contamination. In fact, Specht reported in 1973 that insect community diversity in Aquashicola Creek increased with increasing distance from the smelter (W.L. Specht, 1973. The effects of heavy metals upon the diversity and abundance of benthic macroinvertebrates, Masters Thesis. Pennsylvania State University, University Park, Pa.). In studies conducted from 1986 to 1987, Carline and Jobsis also found a similar reduction in diversity downstream from the cinder pile, but failed to publish these findings (Robert F. Carline and Gerrit J. Jobsis, 1992. Assessment of aquatic animal communities in the vicinity of the Palmerton, Pennsylvania, zinc smelters, Environmental Toxicology and Chemistry, Volume 12, pp. 1661-1670, 1993). Studies published by REWAI in 1987 found elevated levels of lead, cadmium and zinc in the Aquashicola Creek and Lehigh River downstream from the Plant (REWAI, 1987. The New Jersey Zinc/Cinderbank Remedial Investigation, Draft Report to The New Jersey Zinc Company, Palmerton, PA.). And finally, an abstract of the 1979 NEIC study titled: Evaluation of runoff and discharges from New Jersey Zinc Company, Palmerton, Pa. that was printed in the REWAI January 27, 1988 Risk Assessment (REWAI, 1988. Palmerton Zinc Off-Site Area Draft Of Remedial Investigation and Risk Assessment, Volume II, Chapters 5-6) states:

Measurements were made of heavy metal contamination, including cadmium, iron, lead, and zinc, in the surface and groundwater runoff and seepage from the cinder pile at the smelter, from Blue Mountain, and point discharges from the smelter; and in Aquashicola Creek and well water in the vicinity of Palmerton. There were significant contributions of cadmium, manganese, and zinc to Aquashicola Creek from the point and non-point sources at the plant, but little contributions from Blue Mountain. The effluent from one outfall was acutely toxic to rainbow trout. Dissolved zinc appeared to be the primary toxicant. Groundwater from shallow, non-productive wells on the plant property exhibited elevated concentrations of cadmium and zinc.

Palmerton may enjoy one of the purest and most abundant water supplies in the State of Pennsylvania, but that may very well be because the industry is not located in the Swanagunk Mountains of New York.

Finally, it should be recorded that although Dr. Murphy explicitly explained how time was to be metered during each presentation, Dr. Carpenter took considerably more time than was allotted, even though Dr. Murphy politely reminded him several times to complete his remarks.

As promised, EPA Region III Remedial Project Manager Fred Mac Millan's presentation was factual and to the point. His credible assertion that EPA's only interest in Palmerton is to protect human health and the environment should have been sufficient to renew the community's confidence. However, information pertaining to the revised and significantly scaled down remedial action for OU #2, disclosed later in the program, served to renew skepticism; and raised further questions about the possibility of an effective cleanup at Palmerton.

Dr. Susan Garszczyński's presentation was informative and factual, but also raised some interesting questions. For example, Dr. Garszczyński reported the results of Palmerton Hospital's 1991 blood lead studies as percentages, but expressed their 1993-1994 blood lead data as numbers of individuals within certain ranges. Although the 1993-1994 database may not provide a sufficient sample size to generate a statistically significant comparison, it would appear that when all the data is expressed as a percentage, that average blood lead levels in Palmerton are on the increase. Also, it should be noted that the data reflect only volunteer subjects, and do not include other important demographic information like the ATSDR studies. Once again, the sample size from the 1993-1994 data set was surely too small to provide a statistically significant comparison, but regular monitoring of the population to establish a long term trend would seem appropriate.

Dr. McGeehin from ATSDR was also very informative, and it was refreshing to hear someone from ATSDR set the record straight about the "Biological Indicators" studies by emphatically stating that it was not designed to function as a health study or risk assessment, and it should not be interpreted as such. Also, the results of the statistical model that identified an 18% reduction in blood lead levels with every 1000 meters distance from the East Plant is interesting, and indicates the need for further study to see if causality can be conclusively established. Possibly this provides the justification for conducting a speciation study with blood lead samples.

Dr. Bornschein was also very informative, as he provided important information on national trends in blood lead levels, especially urban environments and other highly contaminated Superfund sites. The substantial decreases in blood lead levels realized at Kellogg Idaho and Leadville Colorado, after the institution of lead abatement programs, was encouraging. It may be significant that 1991 blood lead levels were higher in Palmerton (7.0 ug/dL) than the mining community of Leadville, Colorado (4.8 ug/dL), bringing into question the validity of the statement that the blood lead to environmental lead curves at Palmerton are more similar to a mining community than a smelter community. Dr. Bornschein's statement that, based upon the National average, we should expect to see an 8% per year reduction in blood lead levels was also very encouraging, but did not seem consistent with recent blood lead test results from Palmerton Hospital as reported by Dr. Susan Garszczyński. This further reinforces the need for long term monitoring of blood lead levels in the Palmerton community.

R.E. Wright's presentation was informative in that it documented his organizations long working relationship with the industry. EPA's response to the most recent REWAI risk assessment speaks for itself. An outline of Mr. Wright's presentation is included with this review as Appendix B.

Dr. Farfel's presentation was informative for those individuals that are involved with remediating lead based paint. Although there is no conclusive evidence to demonstrate that lead based paint is as important as other sources of lead contamination in the Palmerton area, the PCCE supports lead paint abatement, where appropriate, as part of a comprehensive lead exposure reduction program. It was difficult to make a comparison between the urban environment of Baltimore and the small town atmosphere of Palmerton. Dr. Farfel seemed to ignore the well documented fact that much of the lead in Palmerton is from industrial emissions.

Dr. Chaney's presentation was especially informative, and very interesting. The relationship between proper nutrition and lead bioavailability may be one of the reasons that blood lead levels in Palmerton seem low in comparison to the relatively high concentrations of environmental contamination. Dr. Chaney also indicated that, based upon national averages, and due to major decreases in the use of metal cans seemed with lead solder and leaded gasoline, we should expect to see a decreasing trend in blood lead levels at Palmerton. Once again this reinforces the need for long term monitoring of blood lead levels in the Palmerton population. His recommendation that local farmers should be compensated for the additional lime and fertilizer needed to maintain agricultural productivity was surprising, but certainly warrants further consideration.

The testimony of Dr. Ketterer and Dr. Lowry, principal authors of the NEIC Hazardous Substances Source Identification Study was very informative, well organized, and appropriately supported with excellent presentation graphics. The demonstrated fact that three separate types of chemical analyses produced concurrent results, as well as the competently confident tone of their presentations, added credibility to their conclusions. Furthermore, their recommendation that at least 6 to 8 additional air monitoring stations, that sample at more frequent temporal intervals, be installed at Palmerton should be taken as a challenge to PaDER (who monitors regional air quality), and to the industry, to prove them wrong. The NEIC Hazardous Substances Source Identification Study appears, by comparison, to be one of the most scientifically competent investigations completed at Palmerton to date. While a recent technical review by the MKA project team, in accordance with PCCE Task Schedule #10, has identified some minor deficiencies, there does not appear to be any serious reason to question the overall conclusions of

the report. Any reasonably competent and objective scientist should recognize the NEIC Hazardous Substances Source Identification Study as rigorous scientific research based on peer-reviewed methods. However, Dr. Murphy, Dr. Bornschein, and Dr. Chaney all raised questions or comments that expressed speculation about the validity of the study conclusions. While it may be the responsibility of all objective scientists to question conclusions gained through research, it was difficult to attribute the behavioral predictability of some panelists as the pursuit of objectivity.

EPA Region III, Senior Toxicologist Dr. Reginald Harris also provided a very interesting and informative presentation on EPA's review of the revised REWAI Risk Assessment report. As enumerated in the review provided previously, Dr. Harris identified at least 8 significant points where the REWAI Risk Assessment study was not satisfactory to EPA. Many of them were technical issues that suggest the REWAI study underestimated the potential for human health risks; but possibly the most significant comment was the statement that a risk assessment study is not supposed to be used as a measurement of clinical health effects, but is instead supposed to identify the potential for adverse health effects before they are observed. As Dr. Harris pointed out, this approach to risk assessment is what is necessary for protection of the most sensitive segments of the population, young children, the sick, and the elderly. The difference between observed or clinical health effects and health risk appears to be one of those issues where the three categories identified by Dr. Murphy at the beginning of the symposium (fact, policy, and values) are most closely intertwined.

As a dedicated naturalist, it must have been extremely difficult for Ms. Judy Wink, Director and Chief Naturalist of the Carbon County Environmental Education Center, to read her presentation. As a form of restoration ecology, the revegetation of Blue Mountain is something akin to chemotherapy; where the disease is so serious that it is necessary to risk the life of the patient to save it. While the hint of green visible behind the East Plant suggests a state of remission, it is premature to declare, as Ms. Wink did, that the patient is in recovery. There are many important questions to be asked and answered.

What scientific documentation has been provided to conclusively demonstrate that the application of sludge and fly ash upon Blue Mountain is not contributing to additional surface and groundwater contamination? Sewage sludge has been known to contain relatively high concentrations of all sorts of pollutants. Does anyone perform regular chemical analysis on either of the primary constituents? How permanent is the new vegetative cover, and will it be necessary to apply additional soil amendments once the initial flush of lime and nutrients is used up? Was remediation necessary at all; or, as other areas like the west side of the Lehigh Gap seem to suggest, was revegetation beginning to occur naturally? Ms. Wink briefly mentioned the ecological aberration of an extraordinary over-abundance of grasshoppers. Since an ecological risk assessment was never performed, what other ecological aberrations will occur in the future, and what is the potential for them to spill over onto other less contaminated areas? Is anyone monitoring the small mammal population? The list of questions is unending, and it is impossible at this point to predict if the ultimate outcome will be complete recovery, a patient in need of perpetual care, or an experiment gone awry. One thing is certain, the revegetation of Blue Mountain is an experiment in ecological restoration at such a grand scale, that it warrants comprehensive long-term scientific and ecological study.

PaDER Regional Director Ed Shoener talked briefly about the recent decision to use the re-vegetation technique applied to Blue Mountain for remediation of the Cinderbank. He expressed confidence in the remedial efforts on Blue Mountain, and was most impressed with the engineering accomplishments necessary for distribution of the sludge/fly ash amendments. It is disappointing that the agencies have resigned their efforts for a more effective remediation of OU #2, but even more disappointing that they dropped the requirement to complete the computer modeling needed to determine the most effective remedial technology. An attempt was made to clarify several technical issues by contacting Mr. Shoener at his office, but his secretary directed the questions to other PaDER representatives, and explained that Mr. Shoener was leaving PaDER to work for BCM engineers at their Pocono branch office.

Zinc Corporation Of America, Vice President of Environmental Services, Tom Janeck disclosed that the industry has submitted a new work plan for additional air monitoring stations. It was not made clear by Mr. Janeck if the additional air monitoring stations are to be used for monitoring fugitive emissions in the immediate vicinity of the facility, emissions from fires still burning within the cinderbank, or for monitoring general air quality throughout the Palmerton valley. It was also not made clear what parameters are to be monitored (gases, particulates, metals, etc.) or who would be operating and maintaining the monitoring stations (PaDER, EPA or ZCA). Mr. Tom Dilazaro, from the Pennsylvania Department of Environmental Resources, Bureau of Air Quality said that he was not aware of any additional air monitoring plans at Palmerton, so they would not be operated by PaDER.

As an industry compensated panelist, HRD Reclamation Scientist John Oyler provided a refreshingly informative, relevant and objective presentation. Much to Mr. Oyler's credit and credibility, his concise chronological overview of the events leading up to the revised remedial action for OU #2 provided insight into the Superfund negotiating process that even the agencies seem reluctant to expose. He represents the interests of the industry much more effectively than his superiors by avoiding inaccurate statements and emotional appeals. A printed copy of his Palmerton Zinc Superfund Site, Summary Of Activities, July, 1994 is included with this review following the Remarks of David O. Carpenter in Appendix A.

The 10 questions that Dr. Murphy suggested would be the focus of the executive session are a testament to his stated sense of objectivity. There is a principle of modern relativistic thinking that suggests that the answer is of less importance than the way you ask the question. It would be interesting to learn which if any of the questions were developed by EPA representatives, and which were developed by Dr. Bornschein, Dr. Chaney, and Dr. Murphy. Comments on the 10 questions are provided on the following pages:

1. Is there a current health concern due to lead exposure? If not a current concern, is there a future concern?

The first question was not only clearly answered several times by EPA Remedial Project Manager Fred Mac Millan, but was also specifically addressed by EPA Senior Toxicologist Dr. Reginald Harris. Blood lead testing conducted by ATSDR indicates that there is a health risk from lead exposure at Palmerton, especially for the most sensitive segments of the population. According to Dr. Bornschein, the CDC has determined the threshold blood lead level of concern to be 10 ug/dL. At that level, community education is recommended to reduce blood lead levels. None of the expert panelists challenged the CDC's determination. ATSDR determined in 1991 that 23% of Palmerton children 6 years of age or younger had blood lead levels of 10 ug/dL or greater. The experts agree that there is a current and future health concern from lead exposure in Palmerton. To ask the question again is to beg for a different answer.

2. How does Palmerton compare to other communities with respect to lead exposure?

Does the second question ask: "If people in other towns are exposed to unacceptable levels of heavy metal contamination should Palmerton residents expect to be treated any differently?" Dr. Bornschein's presentation identified several towns across the United States that are contaminated with unacceptable levels of lead, and EPA is working to remediate those communities as well. The drawback of comparing communities is well demonstrated by the fact that blood lead levels in East Jim Thorpe have been reported to be much higher than blood lead levels in Leadville Colorado, another Superfund site. Possibly a more responsible question would have been "How can Palmerton and East Jim Thorpe work together to develop a County-wide lead screening and abatement program?"

3. What are the sources and pathways of lead exposure?

This has and continues to be a very contentious question in the Palmerton community. The multitude of studies briefly described in section 6.1.2 of the January 1988 REWAI Risk Assessment attests to the well documented relationship between smelter emissions and lead concentrations in the vicinity of Palmerton. HRD Reclamation Scientist John Oyler provided historic smelter emissions estimates of 3,740 tons (or 47 tons/year) cadmium; 7,560 tons (or 95 tons/year) lead; and 286,000 tons (or 3,575 tons/year zinc), and reported soil concentrations on Blue Mountain as 900 ppm to 1,500 ppm cadmium, 26,000 ppm to 80,000 ppm zinc, and as high as 6,474 ppm lead in his 1988 report titled: Remediation of Metals - Contaminated Site Near a Zinc Smelter Using Sludge/Fly Ash Amendments: Herbaceous Species. By comparison, according to Mr. Oyler's report referenced above, "...Typical soil concentrations of zinc range from 10 to 300 ppm, while concentrations measured on Blue Mountain varied between 26,000 ppm to 80,000 ppm. Typical soil concentrations of cadmium range from 0.1 to 7.0 ppm, and concentrations measured on Blue Mountain range from 900 ppm to 1500 ppm. Lead has been reported in concentrations as high as 6,474 ppm." (Oyler, John A. 1988. Remediation of Metals - Contaminated Site Near a Zinc Smelter Using Sludge/Fly Ash Amendments: Herbaceous Species. In: Trace Substances in Environmental Health - XXII, 1988.) The recently released NEIC study applied three separate types of chemical source identification analyses, and the results concur that historic and current industrial emissions are the major sources of lead contamination in the Palmerton community. Yet the industry has chosen to disregard all of the hard scientific data presented to date, and continues to insist that the primary source of lead exposure is lead-based paint.

4. What are the remaining major uncertainties?

This is a fair question in that based upon some of the major disagreements between EPA and the industry, there would appear to be many remaining major uncertainties. For example: Is there, as several of the expert panelists suggested, a trend of decreasing blood lead levels in Palmerton, and is the trend in Palmerton consistent with the National trend? What are the current loadings of heavy metal contaminated dusts in Palmerton's air, as measured on a continuous 24 hour basis (as opposed to a three month standard based upon 6 day intervals)? How many of the homes that are inhabited by children with elevated blood lead levels actually have lead based paint that is not safely encapsulated behind several layers of new non-lead based paint? What is the safest, most effective (as opposed to merely cost effective) method for capping the cinderbank? These and many other important questions indicate the need for further study, including long term monitoring of blood lead. Maybe the one question that was never addressed by the Symposium panelists or the PETF, that still needs to be answered is: With so many important questions about the Palmerton Superfund site still unanswered, and so much remediation still to be completed, what is responsible about ending the Superfund program in Palmerton?

5. Is cadmium exposure a cause for concern?

This question was previously answered by the ATSDR Biological Indicators study. The answer is: In 1991 Palmerton adults ages forty and older had significantly higher levels of urine cadmium than adults in the same age group from East Jim Thorpe. Although no difference in renal function was found between the two test populations, cadmium exposure, as measured using creatinine-adjusted urine cadmium, may affect the renal system as measured by AAP and NAG. Further research is needed to confirm whether renal impairment occurs in association with chronic low-level environmental cadmium exposure (<2 ug/g). Yes cadmium exposure is cause for concern, and once again, the need for further study is strongly indicated.

6. Do zinc and arsenic pose health concerns?

Once again, although zinc may not, in and of itself, pose a health concern to humans, zinc phytotoxicity at the concentrations found in Palmerton increases the potential for exposure to soil contaminated with other heavy metals such as lead and cadmium. Although some studies have indicated elevated levels of arsenic in Palmerton soils, the potential for adverse health effects from exposure to arsenic, which is suspected of causing cancer, has not been adequately studied.

7. What issues should be considered in the risk assessment process?

What sort of a question is this? Obviously the issues that should be considered are risks to human health and the environment from elevated levels of environmental contamination. It shouldn't matter whether the risks are from lead, cadmium, arsenic, or uranium, all risks should be fully evaluated. Would it be unreasonably cynical to consider that this question may have been asked to control the scope of the risk assessment?

8. What are the impacts on the local ecosystem/agriculture?

In his concluding remarks, EPA Remedial Project Manager Mr. Fred Mac Millan made the astute observation that the nearly complete defoliation of Blue Mountain is the most obvious indication of widespread environmental contamination in Palmerton. Scores of studies have conclusively documented the severe ecological devastation of Blue Mountain, Stoney Ridge, and the Aquashicola Creek. Elevated levels of heavy metals are detectable as far as 25 kilometers downwind from the East Plant. As John Oyler clearly pointed out, heavy metal toxicity was so acute on Blue Mountain that trees did not even decompose. The impact of phytotoxicity on agriculture should be obvious. Even animal husbandry practices had to be discontinued at one time from zinc toxicosis. Rufus Chaney even recommended that farmers in the Palmerton area should be compensated for the soil amendments needed to maintain agricultural productivity. Certainly the impact upon the local ecosystem and agriculture is not one of the remaining uncertainties. Once again, to ask the question is to beg for a different answer.

9. Can significant sources and pathways be prioritized and interventions recommended?

Of course they can; the need to accurately identify sources and pathways is the principal reason that EPA has decided to conduct their own Risk Assessment. Once the magnitude of the primary pathways have been determined, then effective intervention, in the form of an environmental cleanup, can be accomplished.

10. How does Palmerton develop the local infrastructure to implement and evaluate actions to reduce lead exposure?

Under the Joint and Several Liability clauses of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, the Potentially Responsible Parties (PRP's) should be held responsible for cleaning up contamination that has resulted from historic emissions and current operations. Other lead exposure pathways such as lead based paint, lead pipes used to distribute tap water, and lead exposure from hobbies can be mitigated through a community-wide education and assistance program. In addition, since it would appear that lead contamination is relatively ubiquitous in other parts of Carbon County as well (the Tonolli Corp. Superfund site in Nesquehoning - a previous secondary lead smelter - is another example), the Boroughs of Palmerton, Jim Thorpe, Nesquehoning and other affected municipalities should work with the Carbon County Commissioners to develop a county wide lead screening and abatement program.

However, question # 10 above only addresses the need to reduce lead exposure. What about the need to reduce exposure to cadmium and arsenic? Have sufficient studies been conducted to identify all the contaminants of concern? Has the composition of the cinderbank been sufficiently characterized to determine if other significant contaminants are present? Was the exclusion of other contaminants an oversight or a strategy?

In conclusion, the Palmerton Scientific Symposium was a very valuable educational experience. The dazzling display of scientific expertise was impressive, but somehow overshadowed by the inescapable sense that, even with strong EPA participation, it was a carefully executed industry sponsored infomercial. By marketing the event to the media and the community as a Scientific Symposium, it was possible to apply a fresh coat of objectivity to that rusty old industrial scapegoat lead-based paint. EPA defended their position that industrial activity is primarily responsible for the heavy metal contamination in Palmerton, but their enthusiastic participation functioned primarily to lend credibility to the event. Even the presence of Dr. Michael Ketterer and Dr. Joe Lowry, principal authors of the NEIC study, served to provide the industry with an opportunity to oppose the conclusions of their analysis in public.

As far as the objectives are concerned, the Symposium did provide a community-based forum where the effects of heavy metals contamination on public health and the environment were reviewed and evaluated; but the spirit of the whole affair seemed more like a contest than a workshop, and it was not evident if any differences of opinion were resolved. If anything, the announcement that PaDER and EPA have dropped their previous requirement, that computer modeling be performed to evaluate the effectiveness of various capping technologies for remediation of OU #2, suggests a willingness on the part of the agencies, and not the industry, to make further concessions.

The issue of risk assessment is still one of the major points of contention, and Scientific Symposium Executive Panel Subcommittee members Dr. Bornschein, Dr. Murphy, and Dr. Chaney have offered to assist with establishing the appropriate parameters. For more than a decade, the EPA has asserted that there is a potential for risk to human health and the environment from heavy metal contamination in the Palmerton area. Risks to the environment are easily demonstrated by the toxic character of the soils, which are generally unable to support the vegetation necessary for primary ecological productivity. Demonstrating a risk to public health has been more difficult because of a number of factors, not excluding the great biological and behavioral variability implicit to human populations. For example, Dr. Chaney described the importance of proper nutrition for reducing heavy metal ingestion rates. EPA representatives have stated repeatedly that the purpose of a risk assessment is not to demonstrate clinical health effects, but to identify the risks before health effects can be measured. To achieve that goal and to protect the most sensitive segment of the population it is necessary to set conservative cleanup standards, and implement an effective cleanup program. A cleanup will not solve all of the problems in Palmerton, but it is a good way to start.

During Dr. Carpenter's presentation, he made the remark that "The Company is not the enemy". The obvious question that needs to be asked is "An enemy to who?" A June 3, 1992 article printed in The Morning Call outlined how the Company suggested a willingness to implicate the Borough of Palmerton as partially responsible for cleaning up the cinder bank because part of it was once used as an old borough dump. Morning Call reporter Katharine McKee quoted ZCA President Gary Wickham as having said: "The Borough has been looking at this as if it's someone else's problem. But we're all in this together." In the same article, Ms. McKee also reported Wickham as saying "the more costly the cleanup, the more likely it is the Company will sue the borough". Three days later, on June 5, 1992, the Company issued a statement titled: "SOME FACTS ON THE PALMERTON CINDER BANK", which stated:

Recently an article appeared in the local newspapers regarding the Palmerton Cinder Bank. The article misstated ZCA's position and did not provide the full story. As a result, this may promote a gross misunderstanding of the situation among the residents of Palmerton.

It is not our wish for the remedial solution chosen for the Cinder Bank to result in any cost to the Borough of Palmerton. Excessive cost to ZCA and potentially the Borough will only occur if the EPA is pressured into demanding an unreasonable, unnecessary, and extremely expensive solution because of a limited amount of municipal solid waste (garbage) deposited in the Cinder Bank by the community.

The June 5, 1992 Company statement then went on to blame the PCCE Consultant (presumably MKA) for bringing up the issue that the Borough could be held liable for some of the cleanup costs, and called the PaDER capping alternative (a clay cap covered with soil) a needless waste.

The Morning call printed an editorial on June 16, 1992 in response to the charge that they misstated ZCA's position. That editorial almost prophetically hit the mark in the final two paragraphs, which read:

Instead of reassuring residents that it does not want to put a hook on their tax money - if that is the case - ZCA accused The Morning Call and the Times News of Lehighton of getting the story wrong. Since it did not challenge the accuracy of the stories after they appeared June 3, however, ZCA concedes its interest to be something other than setting the record straight. ZCA wants citizens to help it pressure the U.S. Environmental Protection Agency to allow the cheapest options for dealing with the cinder bank. It argues for the necessity of keeping costs down by portraying the borough as a partner in the cinder bank problem. Using that point as a way of convincing people to join its side is turning out to be an embarrassing venture.

The practice of threatening to sue for compensation by widely applying the Joint and Several Liability provisions of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 seems to be a favorite strategy of the Company. In the example described above, they were successful in pressuring EPA and especially PaDER into accepting the least expensive capping alternative for remediation of OU #2. (Because the Company charges a tipping fee for accepting the sludge from municipal sewage treatment facilities, it is possible that they may even produce a profit from the recently selected remedial action)

In an attempt to daunt Palmerton area residents from participating in the interim cleanup that is currently in progress, the Company has refused to relinquish their right to sue cleanup participants for compensation if they have homes with lead based paint, or have taken legal action against the Company (reference is made to the February 10, 1994 news release issued by Horsehead Industries, Incorporated). This has resulted in a breakdown in negotiations between the Company and the EPA with regards to the interim cleanup. In addition, there has been an initiative by some individuals within the community to discourage and in some instances, with assistance from the PRP's, to intimidate Palmerton area residents from participating in the interim cleanup action. One intimidation strategy has been to publish McCarthy- style lists of the names and addresses of cleanup participants, in an attempt to thwart EPA's promise to maintain confidentiality. Some of these individuals have been described as the new old-timers, so their ties to the Company are clearly established, but it is still hard to imagine what they stand to lose from living in a less contaminated community.

In Palmerton as in Monaca Pennsylvania, Rockwood Tennessee, Calumet Illinois, and Bartlesville Oklahoma, the Company has generated controversy, and taken an adversarial role against environmental regulators and concerned citizens; but it is unfortunate that Dr. Carpenter feels that the Company is perceived as the enemy. True, they have demonstrated that their interests are not in agreement with EPA's stated interest of protecting human health and the environment. They financed a road trip to Aspen Colorado for several prominent members of the Palmerton Community. According to an article by Katharine McKee published in a Tuesday, November 3, 1992 edition of The Morning Call, ...the invitation letter to Palmerton officials was billed as an opportunity to discuss "the need to create a nationwide coalition to combat EPA's mismanagement". (Aspen, which was listed as a Superfund site because of lead contaminated mine tailings, was successful at substantially reducing the scope of a proposed EPA cleanup by sponsoring a "Symposium of Scientific Experts") But the role of ENEMY was never assigned nor implied, especially not by the PCCE.

The PCCE was formed out of a sincere interest in improving the overall environmental quality of the Palmerton area, not to make an enemy of the Company. They have in the past and continue to monitor industrial activities that have the potential to result in additional environmental contamination. With technical assistance provided by McTish, Kunkel & Associates, they review reports and issue comments relevant to the Palmerton Superfund site. They support the efforts of EPA and the Company to conduct competent objective studies for determining and implementing the most effective cleanup technologies. They also support efforts to improve current operations, and provided testimony during October of 1991 in favor of the Company receiving a 30 million dollar bond from the Carbon County Industrial Development Authority, for modernization of the East Plant facility.

Near the end of his presentation, Dr. Carpenter testified that the Company will continue to be a partner for environmental progress. To the PCCE these are words of encouragement, similar to the encouragement they have provided to the Company for making significant environmental improvements to current operations in the recent past. But based upon the Company's past performance in Palmerton, as well as in other communities, this partnership for environmental progress must be based upon a willingness by the Company and the regulatory agencies to be open and honest with the community about their intentions and their negotiations. Real environmental progress must also be based upon respect for the values of all citizens, by assuring that economic productivity does not provide justification for widespread environmental degradation as it has in the past; and by assuring that those individuals who wish to participate in a voluntary cleanup of their properties are provided the opportunity to do so without fear of retribution.

APPENDIX A

REMARKS OF DAVID O. CARPENTER
PRESIDENT OF HORSEHEAD INDUSTRIES
PALMERTON SCIENTIFIC SYMPOSIUM
JULY 29, 1994

FOLLOWED BY:

PALMERTON ZINC SUPERFUND SITE
SUMMARY OF ACTIVITIES
JULY 1994
BY: JOHN OYLER

APPENDIX B
PALMERTON SUPERFUND SITE
SYMPOSIUM 1994
PALMERTON RISK ASSESSMENT
BY: r.e. wright associates, inc.