Public Health Assessment for

PB99-134397

PETITIONED PUBLIC HEALTH ASSESSMENT
WEST PULLMAN IRON & METAL
(a/k/a WEST PULLMAN/VICTORY HEIGHTS)
CHICAGO, COOK COUNTY, ILLINOIS
CERCLIS NO. ILD005428651
MARCH 1, 1999

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry

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THE ATSDR PUBLIC HEALTH ASSESSMENT: A NOTE OF EXPLANATION

This public health assessment was prepared by ATSDR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) section 104 (i)(6) (42 U.S.C. 9604 (i)(6)), and in accordance with our implementing regulations (42 C.F.R. Part 90). In preparing this document, ATSDR has collected relevant health data, environmental data, and community health concerns from the Environmental Protection Agency (EPA), state and local health and environmental agencies, the community, and potentially responsible parties, where appropriate.

In addition, this document has previously been provided to EPA and the affected states in an initial release, as required by CERCLA section 104 (i)(6)(H), for their information and review. The revised document was released for a 30-day public comment period. Subsequent to the public comment period, ATSDR addressed all public comments and revised or appended the document as appropriate. The public health assessment has now been reissued. This concludes the public health assessment process for this site, unless additional information is obtained by ATSDR which, in the agency's opinion, indicates a need to revise or append the conclusions previously issued.

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Division of Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry

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FOREWORD

The Agency for Toxic Substances and Disease Registry, ATSDR, was established by Congress in 1980 under the Comprehensive Environmental Response, Compensation, and Liability Act, also known as the *Superfund* law. This law set up a fund to identify and clean up our country's hazardous waste sites. The Environmental Protection Agency, EPA, and the individual states regulate the investigation and clean up of the sites.

Since 1986, ATSDR has been required by law to conduct a public health assessment at each of the sites on the EPA National Priorities List. The aim of these evaluations is to find out if people are being exposed to hazardous substances and, if so, whether that exposure is harmful and should be stopped or reduced. (The legal definition of a health assessment is included on the inside front cover.) If appropriate, ATSDR also conducts public health assessments when petitioned by concerned individuals. Public health assessments are carried out by environmental and health scientists from ATSDR and from the states with which ATSDR has cooperative agreements.

Exposure: As the first step in the evaluation, ATSDR scientists review environmental data to see how much contamination is at a site, where it is, and how people might come into contact with it. Generally, ATSDR does not collect its own environmental sampling data but reviews information provided by EPA, other government agencies, businesses, and the public. When there is not enough environmental information available, the report will indicate what further sampling data is needed.

Health Effects: If the review of the environmental data shows that people have or could come into contact with hazardous substances, ATSDR scientists evaluate whether or not these contacts may result in harmful effects. ATSDR recognizes that children, because of their play activities and their growing bodies, may be more vulnerable to these effects. As a policy, unless data are available to suggest otherwise, ATSDR considers children to be more sensitive and vulnerable to hazardous substances. Thus, the health impact to the children is considered first when evaluating the health threat to a community. The health impacts to other high risk groups within the community (such as the elderly, chronically ill, and people engaging in high risk practices) also receive special attention during the evaluation.

ATSDR uses existing scientific information, which can include the results of medical, toxicologic and epidemiologic studies and the data collected in disease registries, to determine the health effects that may result from exposures. The science of environmental health is still developing, and sometimes scientific information on the health effects of certain substances is not available. When this is so, the report will suggest what further public health actions are needed.

Conclusions: The report presents conclusions about the public health threat, if any, posed by a site. When health threats have been determined for high risk groups (such as children, elderly, chronically ill, and people engaging in high risk practices), they will be summarized in the conclusion section of the report. Ways to stop or reduce exposure will then be recommended in the public health action plan

ATSDR is primarily an advisory agency, so usually these reports identify what actions are appropriate to be undertaken by EPA, other responsible parties, or the research or education divisions of ATSDR. However, if there is an urgent health threat, ATSDR can issue a public health advisory warning people of the danger. ATSDR can also authorize health education or pilot studies of health effects, full-scale epidemiology studies, disease registries, surveillance studies or research on specific hazardous substances.

Interactive Process: The health assessment is an interactive process. ATSDR solicits and evaluates information from numerous city, state and federal agencies, the companies responsible for cleaning up the site, and the community. It then shares its conclusions with them. Agencies are asked to respond to an early version of the report to make sure that the data they have provided is accurate and current. When informed of ATSDR's conclusions and recommendations, sometimes the agencies will begin to act on them before the final release of the report.

Community: ATSDR also needs to learn what people in the area know about the site and what concerns they may have about its impact on their health. Consequently, throughout the evaluation process, ATSDR actively gathers information and comments from the people who live or work near a site, including residents of the area, civic leaders, health professionals and community groups. To ensure that the report responds to the community's health concerns, an early version is also distributed to the public for their comments. All the comments received from the public are responded to in the final version of the report.

Comments: If, after reading this report, you have questions or comments, we encourage you to send them to us.

Letters should be addressed as follows:

Attention: Chief, Program Evaluation, Records, and Information Services Branch, Agency for Toxic Substances and Disease Registry, 1600 Clifton Road (E-56), Atlanta, GA 30333.

TABLE OF CONTENTS

SUMMARY 4
Dutch Boy 4
International Harvester 4

BACKGROUND 5
Site Description and History 5
Site Visit 6
Demographics/Land Use/Natural Resources Use 6
Health Outcome Data 7

COMMUNITY HEALTH CONCERNS 7

ENVIRONMENTAL CONTAMINATION AND OTHER HAZARDS 8
Dutch Boy: On-site Contamination 8
Surface Soil 8
Subsurface Soil 9
Surface Water 10
Groundwater 10
Air 10
Sediment and Standing Water 11
Dutch Boy: Off-Site Contamination 11
Surface Soil 11
International Harvester: On-Site Contamination 12
Surface Soil 12
Surface Water 13
Groundwater 13
Air 13
Manholes 14
International Harvester: Off-Site Contamination 14
Surface Soil 14
Surface Water 15
Quality Assurance/Quality Control 15
Physical and Other Hazards 16

PATHWAYS ANALYSIS 16
Dutch Boy 16
Completed Exposure Pathways 17
Air 17
Surface Soil 17
Potential Exposure Pathways 18

Surface Soil 18
Air 18
International Harvester 19
Completed Pathways 19
Surface Soil 19
Potential Exposure Pathway 21
Surface Soil 22
Air 22

PUBLIC HEALTH IMPLICATIONS 23
Toxicologic Evaluation 23
Health Outcome Data Evaluation 29
Community Health Concerns Evaluation 29

CHILD HEALTH INITIATIVE 30

CONCLUSIONS 32
Dutch Boy 32
International Harvester 33

RECOMMENDATIONS 33
Dutch Boy 33
International Harvester 34

PUBLIC HEALTH ACTION PLAN 34
Dutch Boy 34
International Harvester 34

PREPARERS OF REPORT 35

Appendix A-Maps 36

Appendix B-Letter to USEPA and IEPA 40

Appendix C-PAH Tables 43

Appendix D-Comparison Values 48

Appendix E-Response to Public Comments 51

REFERENCES 84

SUMMARY

The West Pullman/Victory Heights/Maple Park site consists of two abandoned industrial properties. The Navistar International Transportation Corporation (Navistar) property is commonly called International Harvester (IH) and the NL Industries, Incorporated property is commonly called Dutch Boy (DB). These industries were active from the early part of this century until the early 1980s when the factories were closed and abandoned. These are adjacent sites located in the mixed industrial and residential Calumet area of southeast Chicago. A member of the community petitioned the Agency for Toxic Substances and Disease Registry (ATSDR) to review available environmental and health data for both properties and make recommendations regarding potential health effects.

Dutch Boy

There is a potential exposure to residents via incidental ingestion or inhalation of lead-contaminated soil along the north/northeast roadways bordering the Dutch Boy site. On-site surface soil presents a potential health hazard to remedial workers and trespassers. Current site security appears to adequately prevent casual entrance onto the site.

In the past, on-site workers and trespassers were exposed to polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) in the surface soil. PAHs and PCBs in the on-site soil do not constitute a current or future hazard to public health.

International Harvester

Residents near the International Harvester site have a potential for exposure to PAHs, arsenic, barium, cadmium, lead, manganese, vanadium, and zinc in on-site surface soils. This exposure could result from contact or incidental ingestion of contaminated soil and dust. Based on current knowledge regarding the characteristics of these substances, however, exposure to the levels of contaminants present at this site are not likely to cause adverse health effects. The integrity of the fence surrounding the site appears to be an ongoing issue, and the site is easily accessible to trespassers. The potential for exposure to asbestos and PAHs exists via inhalation from dust resulting from site remediation activities.

In the past, workers and trespassers on the site were potentially exposed to PAHs, arsenic, barium, cadmium, lead, manganese, vanadium, and zinc. Site security was not established until the summer of 1997, and pedestrians could enter the site before that time. According to the petitioner, the area was a common shortcut for area residents. At the levels detected and the short duration of probable exposure, adverse health effects are unlikely to occur as a result of exposure to these site substances.

Asbestos is present on the site as a component of other materials such as siding. It is possible that workers and trespassers were exposed to asbestos in the past via inhalation of asbestos-laden dust. While data do not exist to evaluate past exposures, adverse health effects are unlikely due to the limited exposure that occurred during the period of work at the site.

Currently, for people trespassing on the site, both the Dutch Boy and the International Harvester properties represent a potential public health hazard. Limited data are available to assess potential off-site exposures to site-related contaminants, and therefore, exposure to off-site contaminants from the International Harvester and Dutch Boy properties is classified as an indeterminate public health hazard.

BACKGROUND

I. Site Description and History

The West Pullman/Victory Heights site consists of two abandoned industrial properties. The Navistar International Transportation Corporation (Navistar) property is commonly called International Harvester (IH) and the NL Industries, Incorporated property is commonly called Dutch Boy (DB). These sites are adjacent and located in the mixed industrial and residential West Pullman/Victory Heights/Maple Park area of southeast Chicago. The sites are surrounded on three sides by active or abandoned industrial properties. Roadways border the north and east sides of the properties. Christ Universal Temple Church abuts the northwest corner of the IH property. The southern edge of the combined property runs along the Metralink rail line. Immediately beyond the rail line are residences and the play yard of an elementary school (see Appendix A, maps 1 and 2). The closest residence is 250 feet from the IH site and 600 feet from the DB site. The school is approximately 625 feet from the site. Map 3 in Appendix A gives demographic information on the population living within 1 mile of both properties.

Dutch Boy

Lead-based paints were produced at the 5-acre Dutch Boy site from 1937 to1980. Operations were shut down in 1980, and the site is currently a vacant lot. Demolition and salvaging activities occurred from 1983 to 1986 (1). In 1985, the Illinois Department of Public Health (IDPH) notified the Illinois Environmental Protection Agency (IEPA) that five people were diagnosed with lead poisoning linked to salvaging activities at the Dutch Boy site (2). IEPA determined that airborne solid lead particles released from building surfaces during demolition activities were the source of exposure (2). These activities were stopped after lead and asbestos were determined to pose an imminent danger to the surrounding community. An additional four people were identified with elevated blood lead levels during subsequent sampling by the IDPH.

Fencing encloses the entire property; no breaches were noted during a site visit conducted in 1997. Basements and open chambers on the site have been either filled or partitioned off with

yellow caution tape. Open manholes are covered by concrete slabs. Debris piles were originally covered with plastic sheeting, but only remnants of the sheeting remain. Weeds and trees have covered much of the exposed soil. In 1996, the United States Environmental Protection Agency (EPA) issued a unilateral administrative order to NL Industries under the Comprehensive Environmental Recovery, Compensation, and Liability Act (CERCLA) to secure, sample, and clean up the site.

International Harvester

International Harvester manufactured heavy machinery at their 21-acre site from 1903 to 1983. Primary operations included woodworking, on-site power generation, metal forging, punching, heat treating, machining, and painting. Operations stopped in 1983, and the site is currently a vacant lot. In 1987 the property was purchased with the intention of building low income housing.

Although the property is fenced, significant breaches are present along the Metralink rail line side (2). There are many physical hazards on the site, such as open, water-filled manholes, basements, and other chambers. Weeds and trees have covered much of the exposed soil. Contaminants of concern are PAHs, lead, and asbestos from work processes, degraded building materials, and accidental spills. ATSDR sent a letter addressing the sites physical hazards to the IEPA project officer and the EPA Region V director of Superfund on August 1, 1997 (Appendix B). Navistar entered the voluntary site remediation program in 1996 with IEPA as the lead agency.

II. Site Visit

The ATSDR headquarters staff members and Region V representative performed a site visit on June 25-26, 1997. During this visit, ATSDR met with the regional ATSDR and EPA staff members to discuss sampling and ongoing work at the site. ATSDR met with the petitioner and other community members to obtain their concerns. ATSDR also attended a scheduled meeting with the Maple Park/Victory Heights Advisory Council, an established community advisory panel formed with the EPA and IEPA as members.

III. Demographics/Land Use/Natural Resources Use

The U.S. census data of 1990 indicates a total population of 36,967 persons living within one mile of the site (Appendix A, map 3). African-Americans comprise 93% of the population, whites approximately 6%. The remaining 1% of the population is composed of American Indians, Aleuts, Eskimos, Asian or Pacific Islanders, or other races. Approximately 8% of the population is of Hispanic origin. Children of 6 years and younger make up 10% of the population. Individuals older than 64 years make up approximately 7% of the local population. The area is considered middle class; the median yearly income is approximately $27,000 to $32,000.

Land use of the DB and IH properties did not change during their operation as businesses. The properties have remained inactive since being abandoned in the early 1980s. Remediation plans have been accepted for both sites. Planned future development is for light industry under the city of Chicago's Brownfields program. EPA has oversight for the Dutch Boy site remediation and IEPA has oversight for remediation of the International Harvester site.

IV. Health Outcome Data

In 1985, lead testing was conducted on area residents. Two adults and three children who had been on the site from 1983 to1986, were reported to have elevated blood lead levels. These elevated levels were attributed to the demolition activities at the Dutch Boy site (2). ATSDR does not have the original documentation of these elevated blood lead levels and relies on statements in previous reports for this information. In June of 1986, the Chicago Department of Public Health provided residents with blood lead screening. An additional four people were identified with elevated blood lead levels. The data show that greater than 90% of the blood lead levels were below 20 micrograms per deciliter (μg/dL), the CDC suggested level of concern at the time for blood lead. In 1996, the City Health Department offered blood lead screening to neighborhood children. Only eight children were tested. It is not known how large an area was tested or how the community was informed of the testing. According to the city, all were below 10 μg/dL. The West Pullman neighborhood was included in the Southeast Chicago Health Outcome Data Study (3). No other health outcome studies have been performed on this population.

COMMUNITY HEALTH CONCERNS

Specific health concerns of area residents include the following: asthma, allergies, aggressive behavior in children (especially children of high school age), cancer (breast and prostate), low birth rate, heart problems (neighbor has a pacemaker), rashes, kidney problems, and sarcoidosis.

Environmental Concerns

Dutch Boy - The petitioner expressed concern regarding exposures to lead at the DB site. Prior sampling showed other chemicals present on the DB site and community members questioned why these are not also being addressed. Community members requested health information on identified contaminants, exposure likelihood, exposure routes, and possible health effects.

International Harvester - The petitioner and other residents are concerned about thick, black, oily sludge that enters their basements after a heavy rain. According to the petitioner, this is the same type of sludge that is found in manholes on the IH property. The petitioner requested sampling for contaminants in surface water flowing off-site to address health concerns.

ENVIRONMENTAL CONTAMINATION AND OTHER HAZARDS

The available environmental monitoring data are presented in this section. Contaminants in soil and air are reviewed separately for the Dutch Boy and International Harvester sites. Whether exposure to these contaminants has public health significance is evaluated in subsequent sections of this public health assessment (PHA). ATSDR selects and discusses contaminants based on several factors, including concentrations on and off the site, comparison of on- and off-site concentrations with comparison values for noncarcinogenic and carcinogenic endpoints, and community health concerns.

Even though a contaminant is listed in a table in the document it does not mean that it will cause adverse health effects, if exposure occurs at the specified concentrations. Contaminants included in the tables are further evaluated in this PHA. The potential for adverse health effects from exposure to the contaminants listed is discussed in the Public Health Implications section.

Comparison values for ATSDR public health assessments are concentrations of contaminants in specific environmental media (i.e., air, soil, drinking water) that are not expected to produce an adverse health effect in people who are exposed. These values are used only as screening values. When the concentration of a contaminant detected on or off the site is above the comparison value, it is further evaluated to determine the potential for adverse health effects. See Appendix E for a description of the comparison values used in this PHA. ATSDR considers both adults and children when developing comparison values, with the assumption that in certain situations children may be more sensitive and more exposed to contaminants. For example, children may come into contact with and ingest soil particles at higher rates than do adults; also some children with an uncommon behavior trait known as "pica" are more likely than others to ingest soil and other nonfood items.

Dutch Boy: On-site Contamination

Surface Soil

Elevated lead levels have been found on the site in all sampling performed from 1987 to the present. Lead concentrations are generally highest in the western half of the site, in particular near the loading docks. A 1993 site investigation found on-site soil lead at levels (4) above 2,000 parts per million (ppm).

Sampling in June 1995 indicated surface soil lead concentrations as high as 2,450 milligram per kilogram (mg/kg) at a 3-inch depth (5). EPA recommended that, a) further action be taken at the site; b) the site be secured immediately with a fence; and c) an extent of contamination study be conducted to better characterize the extent of lead contaminated soil at the site. Sampling in July 1997 also indicated elevated lead levels in the surface soil [Table 1] (6). Currently, ATSDR has no health comparison values for lead (7). EPA's action level for lead in residential soil is 400

parts per million (ppm) (USEPA, June 1998).

Several polycyclic aromatic hydrocarbons (PAHs) have been identified on the DB property. A complete listing of the PAHs found on the site is provided in Appendix C, Table A. ATSDR's Cancer Risk Evaluation Guidelines (CREGs) are based upon the assumption of extended chronic exposure for 70 years, a condition that does not apply to this site (see the section on Toxicological Evaluation).

Polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs) were identified in surface soil by the Ecology and Environmental study in 1995 (5). PCBs were found at 0.516 ppm 3" below ground surface (bgs) in one on-site sample. PCBs did not exceed ATSDR's Chronic Environmental Media Evaluation Guidelines (EMEGs) for noncancer effects. VOCs were detected at levels well below comparison values in the top soil (0.2 -1ft bgs). Table 1 gives the PCB and PAH levels found on-site in the 1995 study.

Table 1. Dutch Boy on-site surface soil data, 0-2 inches below ground surface

Compound	Concentration (ppm)*	Comparison Value	
		Value (ppm) [pica child/child/adult]	Source
Lead[1]	9.9-18,300	400	EPA action level for residential soils[4]
PAHs [2,3]	Appendix C, Table A	0.1	CREG, EPA-B2
PCBs[2]	0.516	0.4 0.04/1/10	CREG, EPA-B2 chronic EMEG

[1] Data source: ENVIRON Corp. *Draft Extent of Contamination Survey, Dutch Boy Site, Chicago, Illinois.* July 1997.
[2] Data Source: Ecology & Environment, Inc. *Site Assessment for International Harvester/Dutch Boy Site, Chicago, Illinois.* August 1995.
[3] See Appendix C, Table A, for specific PAHs
* ppm: parts per million
[4] USEPA, June 1998

Subsurface Soil

Elevated lead levels have been found in subsurface soils (greater than 3" bgs). Testing in 1994, on behalf of the city of Chicago, found subsurface soil lead concentrations at a maximum concentration of 1,000 ppm at 1 to 2.5 ft bgs (8). Lead concentrations exceeded 40,000 ppm in surface soil samples taken from 1-4 feet below grade and collected near the loading dock

(Environ, 1997, Table 1, samples SS08-SS12.)

Sampling in 1987 concluded that elevated VOC levels found 1-4 ft below ground surface (bgs) were due to surface spills rather than leaking underground storage tanks (USTs) (9). In 1994 VOCs were detected in subsurface soils (trichloroethene at 4.3 ppm and tetrachloroethene at 48 ppm; both samples were taken 6-15 ft bgs. These values are well below ATSDR's comparison values for a child (100 ppm and 500 ppm). Sampling in 1995 detected VOCs in subsurface soils (1- 8 ft bgs) but the values were below health comparison values (5).

Surface Water
Testing in 1993 found that standing water in the mill building met city requirements for discharge to the sewer system (4). This water contained VOCs at a total concentration of 57 ppm.

Groundwater
Groundwater has not been characterized. All residents of Chicago, including residents of this area, obtain their drinking water from Lake Michigan (2).

Air
No air monitoring or sampling occurred during the demolition activities from 1983 through 1986. Monitoring was performed for respirable dust and lead in 1996 during the demolition of the remaining on-site structures (10). Monitors were placed along the perimeter of the property. One station was located upwind of the site, three downwind. No recordings of respirable dust exceeded the voluntary action level of 2.5 mg/m^3 (milligram per cubic meter) (one half of the Occupational Safety and Health Administration (OSHA) permissible exposure level (PEL)) at any time during the demolition. Except for one daily recording period in which a level of 26.1 microgram per cubic meter ($\mu g/m^3$) was recorded, lead levels met the voluntary action level of 25 $\mu g/m^3$ (one half of the OSHA PEL). ATSDR does not consider this exceedence significant. No quality assurance/quality control (QA/QC) information was available for this data.

Perimeter on-site air sampling was performed in December 1996 for asbestos, lead, arsenic, and respirable dust (Table 2) (6). Two samples were collected for asbestos; the maximum level measured was 0.0008 fibers/ml. ATSDR's CREG for asbestos in air is 0.000004 fibers/ml. Two low volume air samples were taken for measurement of lead and arsenic. The maximum lead level was 3.1 $\mu g/m^3$ (PEL = 50 $\mu g/m^3$ for airborne lead). Arsenic measurements were below the detection limits of 0.16 $\mu g/m^3$ and 0.14 $\mu g/m^3$. Real time air monitor (RAM) was used to measure respirable dust (6). The airborne concentration of respirable dust was recorded at 0.035 $\mu g/m^3$, less than the advisory action level of 0.20 $\mu g/m^3$. The OSHA PEL for respirable dust is 5 mg/m^3. No QA/QC information was provided with the air data.

Table 2. Dutch Boy air monitoring data [1]			
Compound	Concentration	Comparison Value	
		Value	Source
Asbestos	0.0008 f/cm^3	0.000004 f/ml	CREG
Lead	3.1 μg/m^3	1.5 μg/m^3	NAAQS[2] Standard
Arsenic	< 0.14 μg/m^3 *	0.0002 μg/m^3	CREG
Dust (respirable)	0.035 μg/m^3	NA	NA

[1] Data source: ENVIRON Corp. *Draft Extent of Contamination Survey, Dutch Boy Site, Chicago, Illinois.* July 1997. The QA/QC for the air data was not available.
[2] National Ambient Air Quality Standard
* Detection limit is 0.14 microgram per cubic meter (μg/m^3)
fibers per cubic meter (f/cm^3)

Sediment and Standing Water
Sediment from the former mill building had 25,000 ppm of lead at 0-0.2 ft bgs (6). Standing water in the mill building basement was analyzed for cyanide, VOCs, semi-volatile organic compounds (SVOCs), metals, and asbestos (4). Asbestos was not detected. VOC and SVOC levels were below the detection limits of 10-50 ppb and 10 ppb respectively. Cyanide was measured at 4.0 ppb, well below the soil comparison value for children of 200 ppb (chronic RMEG). The manganese level was 88 ppb, above the chronic Reference Dose Media Evaluation Guide (RMEG) for children (50 ppb) but below the adult level (200 ppb). Lead was detected at 104 ppb.

Dutch Boy: Off-Site Contamination

Surface Soil
A site investigation in 1993 found soil lead levels elevated on the roadway northeast of the site (4). Sampling in 1997 revealed several areas with elevated lead levels on adjacent roadways and properties (see map, Appendix A) (6). Although this map provides points of sampling, it is difficult to discern where they were taken, i.e. on residential property, vacant lots, or on the side of a road. Providing street names and information on the type of property (residential, vacant, industrial) sampled is necessary to identify off-site areas of concern.

Table 3. Dutch Boy off-site surface soil data, 0-2 inches below ground surface[1]			
Compound	Concentration Range (ppm)	Comparison Value	
		Value (ppm)	Source
Lead (roadways)	205-24,000	400	EPA action level for residential areas [2]
Lead (urban vicinity)	46-16,200	400	EPA action level for residential areas [2]

[1] Data source: ENVIRON Corp. *Draft Extent of Contamination Survey, Dutch Boy Site, Chicago, Illinois.* July 1997.
[2] USEPA, June 1998

International Harvester: On-Site Contamination

Surface Soil
PAHs were detected in on-site soils tested by IEPA in 1988 (11). Elevated levels of PAHs were also detected during repeated sampling by EPA in August 1993 (12) and by IEPA in March 1995 (13), Table 4. A complete listing of the PAHs found on-site with their comparison values is provided in Appendix C-Table B. No QA/QC information was available for the 1995 IEPA data, however, the values are similar to those in 1993 which had QA/QC information.

Sampling in 1987 detected PCBs at a maximum concentration of 18 ppm (depth unknown). Follow-up investigations conducted in June 1995 indicated that levels were below the minimum detection limit (mdl) (14).

Several heavy metals were detected at levels above comparison values for a child (13). Table 4 presents the concentration ranges and comparison values of these metals.

Asbestos was first investigated on this site by the EPA in 1987. Asbestos containing materials (ACM) found were of the non-friable type (i.e. not brittle and therefore less hazardous). IEPA conducted an investigation in 1988 and found asbestos in soil samples (unknown depth and concentration). In 1993, one sample of ACM found on the site was determined to be 40% chrysotile asbestos (7).

Table 4. International Harvester on-site contaminant data[1]

Media/Compound	Concentration Range (ppm)	Comparison Value	
		Value (ppm) [pica child/child/adult]	Source
SOIL: 1-6 inches bgs[2]			
Total PAH[3]			
Benzo(a)pyrene	0.28J - 410	0.1	CREG (EPA-B2)
Arsenic	6.4 - 153	0.6 / 20 / 200 0.5	chronic EMEG CREG (EPA-A)
Barium	109 - 1890	100 / 4,000 / 50,000	chronic RMEG
Cadmium	2.0 - 17.2	1/40/500	chronic EMEG
Lead	298 - 1540	--	carcinogen, EPA-B2
Manganese	261 - 550	10 / 300 / 4,000	chronic RMEG
Zinc	248 - 1610	600 / 2,000 / 200,000	chronic EMEG

[1] Data source: IEPA. *Site Inspection Prioritization, International Harvester Site, Chicago, Illinois.* March 1995. No QA/QC accompanies this report.
[2]bgs - below ground surface
[3] See Appendix C-Table B for individual polycyclic aromatic hydrocarbons (PAHs).

Surface Water
Sampling in 1993 detected acetone at a maximum 0.770 ppm in standing water from on-site pools (12). Acetone is often a common lab contaminant. It is possible that this sample value is due to contamination during analysis.

Groundwater
Groundwater has not been characterized. Area residents' tap water was tested for contaminants by the Chicago City Water Department. According to city officials, this is not a likely exposure route for contaminant migration since all Chicago residents receive their drinking water from Lake Michigan (2).

Air
Air monitoring was not conducted during the 1984 - 1985 demolition. There was some concern by the IEPA that illegal demolition had occurred at this time. Perimeter sampling was performed for respirable dust in 1996 during demolition of the remaining on-site structures. No elevations

above the voluntary action level of 2.5 mg/m^3 for respirable dust (one half of the OSHA PEL) were recorded (10). No QA/QC information was available for this data.

Manholes
A black oily sludge sample was taken from the bottom of an on-site manhole in 1995 and analyzed for contaminants. See Appendix C-table C for a listing of contaminants found. Sampling by IEPA detected PAHs and inorganic metals above ATSDR child comparison values (13). VOCs were below comparison values.

International Harvester: Off-Site Contamination

Surface Soil
Surface soil sampling was performed at the nearby elementary school play yard and four private residences in March 1995 (13). The school and residences are located on the opposite side of the railroad tracks along the southern edge of the site. See Appendix C - Table D for a complete listing of the PAHs identified in off-site soils. Metals detected include arsenic, barium, cadmium, lead, manganese, and vanadium. Table 5 presents the list of metals found in off-site soils.

A different sampling round in June 1995 also focused on off-site surface soils (14). A total of five samples were taken: two at the elementary school, one residence, and along the western and northern borders of the IH site. These samples were analyzed for VOCs, SVOCs, PCBs, organochlorine pesticides, total and reactive cyanide and sulfide, priority pollutant metals, total petroleum oils, oil and grease. Pesticides and PCBs were below the minimum detection limits (not given). Metals were also detected. Arsenic levels were measured from 10.6 - 22.1ppm. Lead levels ranged from 21.3 ppm to approximately 540 ppm. All other tested contaminants were undetected (mdls of 5 - 10 μg/kg).

Table 5. International Harvester off-site contaminant data[1]			
Media/Compound	Concentration Range (ppm)	Comparison Value	
		Value (ppm) [pica child/child/adult]	Source
SOIL: 0-2 inches bgs[2]			
Total PAH[3]		0.1	CREG, (EPA-B2)
Arsenic	5.6 - 10.4	0.6 / 20 / 200 0.5	chronic EMEG CREG (EPA-A)
Barium	108 - 286	100 / 4,000 / 50,000	chronic RMEG
Cadmium	0.84 - 2.0	1 / 40 / 500	chronic EMEG
Lead	96.6 - 393	400	EPA action level[4]
Manganese	202 - 330	10 / 300 / 4,000	chronic RMEG
Vanadium	26 - 39.2	6 / 200 / 2,000	intermediate RMEG

[1] Data source: IEPA. *Site Inspection Prioritization, International Harvester Site, Chicago, Illinois.* March 1995. No QA/QC accompanies this report.
[2] bgs - below ground surface
[3] See Appendix C-Table D for complete listing of polycyclic aromatic hydrocarbons (PAHs).
[4] USEPA, June 1998

Surface Water
No off-site sampling of surface water has been conducted.

C. Quality Assurance / Quality Control

In preparing this health assessment, ATSDR relied on information provided in the referenced documents. Unless there is information or data to suggest otherwise, it is assumed that adequate quality assurance and quality control measures were followed regarding the chain of custody, laboratory procedures, and data reporting. The analyses, conclusions, and recommendations in this health assessment are based on the completeness and reliability of these referenced documents.

D. Physical and Other Hazards

Dutch Boy

This site has been fenced since summer 1996 and the fence integrity appears to be good. The majority of physical hazards on the site have been eliminated or marked. Manholes and basements have been filled in with earth or cordoned off with yellow caution tape. No deep standing water chambers or pits were noted.

International Harvester

The International Harvester site contains numerous physical hazards. These include the significant gaps to the fence along the southern boundary (along the rail line). All repairs occurred in June 1997, but maintaining fence integrity has been a problem (14). It has been stated that open manholes, chambers, and water filled pits remain and continue to be a physical hazard for persons working or visiting the site (14).

PATHWAYS ANALYSIS

To determine whether people were exposed to contaminants originating from the DB and IH site, ATSDR evaluated the environmental and human components that lead to human exposure. This pathways analysis consists of five elements:

1) *Source of contamination*
2) *Environmental medium in which the contaminants may be present or may migrate*
3) *Points of human exposure*
4) *Routes of human exposure such as ingestion, inhalation, or dermal exposure*
5) *Receptor population*

ATSDR identifies exposure pathways as completed, potential, or eliminated. An exposure pathway is complete in the past, present, or future if all five elements of an exposure pathway link the contaminant source to a receptor population. Potential pathways, however, are defined as situations in which at least one of the five elements is missing, but could exist. Potential pathways indicate that exposure to a contaminant could have occurred in the past, could be occurring now, or could occur in the future. Eliminated exposure pathways are those where site characteristics make past, current, and future exposures through the pathway extremely unlikely.

Dutch Boy

I. Completed Exposure Pathways

See Table 6 for completed exposure pathways.

Air

A past completed exposure has been identified for deposition of airborne lead onto surface soil at the Dutch Boy site. Persons going onto the site during or after the demolition activities of 1983-1985 were exposed via inhalation of lead in air or by contact with lead by dermal, inhalation, or ingestion of contaminated air, dust or soil. In 1985, two adults and three children were reported with elevated blood lead levels subsequent to spending time on the site. These elevated levels were attributed to the demolition activities at the Dutch Boy site (2). An additional 4 persons were identified with elevated blood lead levels during subsequent sampling. ATSDR does not have original documentation of these elevated blood lead levels and relies on statements in previous reports for this information. It is likely that workers in the plant when it was operational were also exposed via inhalation or ingestion of contaminated air, dust, and soil. No data were found to support this assumption.

Surface Soil

Surface soil contaminated predominately with lead, but also with PAHs and PCBs, constitutes a past completed on-site exposure pathway. Persons entering the site had an opportunity to be exposed via inhalation or incidental ingestion of contaminated soil. Workers were also likely to be exposed via inhalation or ingestion of contaminated soil during the operation of this site, although there are no supporting data.

Table 6. COMPLETED EXPOSURE PATHWAYS, DUTCH BOY ON-SITE

Pathway Name	Source	Contaminant and Level (Max)	Environ-mental Medium	Point of Exposure	Route of Exposure	Exposed Population (No.{option)	Time/ Date, if known
Air	Dutch Boy, demolition activities	Lead *(unknown)*	Air/Dust/ Soil	Demolition site	Inhalation/ Ingestion	Workers, trespassers (blood lead data)	Past
Surface soil	Dutch Boy	Lead (18,300 ppm) Total PAH[a] PCBs[b] (0.516 ppm)	Soil	Soil surface (exposed), clothing, hands	Inhalation/ Ingestion/ Dermal	Workers, trespassers	Past *

*Fence installed July/August 1996

[a] See Appendix C-Table A for individual polycyclic aromatic hydrocarbons (PAHs)

[b] Polychlorinated biphenyls (PCB)

II. Potential Exposure Pathways, On-and Off-Site-Dutch Boy

See Table 7 for potential exposure pathways.

Surface Soil
Trespassers, particularly children playing on the abandoned site prior to it being fenced in 1996, were potentially exposed to lead in the past by incidental ingestion. Vegetation currently growing on the site minimizes the amount of exposure to contaminated soil and blowing dust. However, there is seasonal variation in the amount of vegetative cover present on this site. Persons entering the site when there is minimal vegetation are potentially at risk of exposure.

Current and future exposure of the general public to on-site surface soil contaminants is believed to be low. The fencing installed appears to have inhibited transient passersby from entering the site.

Remedial workers and trespassers coming into contact with on-site soil risk exposure via ingestion and possibly inhalation of lead laden soil and/or dust. This risk is minimized by the seasonal vegetation growing on the site.

A current and future potential pathway of exposure exists for lead in surface soil off the site. Pedestrians on the north and northeast parkways bordering the site are potentially exposed to elevated lead levels via inhalation or ingestion of soil and/or dust. Vegetation growing along the roadside minimizes this risk.

Air
A potential past, current, and future exposure pathway exists for workers, trespassers, and area residents via inhalation of particulate in the ambient air. Workers were likely exposed in the past to elevated lead levels in the air from work processes and possibly inhalation of lead laden dust particles.

Current and future exposures are possible for remedial workers and area residents. The potential for contaminated soil to become airborne during remediation presents a hazard to unprotected workers and area residents via inhalation.

Table 7. POTENTIAL EXPOSURE PATHWAYS, DUTCH BOY (DB)

Pathway	Source	Contaminant	Point of Exposure	Route of	Exposed	Time
ON-SITE						
Surface soil	On-Site	Lead	Surface Soil	Ingestion, Inhalation, Dermal	Trespassers, Remedial workers	Past, Current, Future
Air	On-site	Lead	Air, particulate	Inhalation	Workers, trespassers	Past, Current, Future
OFF-SITE						
Surface soil	Off-Site, DB (roadway)	Lead (24,000)	Surface Soil- Residential streets	Ingestion, Inhalation, Dermal	Area residents	Past, Current, Future
Air	On-site	Lead	Air, particulate moving off-site during past operation and future remediation	Inhalation	residents	Past, Future

*ppm: parts per million

International Harvester

I. Completed Pathways

See Table 8 for completed on-site exposure pathways.

Surface Soil

A past completed exposure pathway has been identified for the surface soil on the site. The primary contaminants are PAHs (see Appendix C). Workers and trespassers coming into contact with the contaminated soil may have been exposed via ingestion.

Other contaminants identified in on-site surface soil include various metals and asbestos. Arsenic and cadmium were present at levels exceeding their respective CREGs (cancer comparison values). Workers and trespassers coming into contact with contaminated soils may have been exposed via ingestion and possibly inhalation of soil and/or dust.

Table 8. COMPLETED EXPOSURE PATHWAY, INTERNATIONAL HARVESTER(IH)-- ON-SITE

Pathway Name	Source	Contaminant and Level (Max, ppm) [a]	Environ-mental Medium	Point of Exposure	Route of Exposure	Exposed Population	Time/ Date, if known
Surface Soil	IH	Total PAHs[b] Arsenic (153) Barium (1890) Cadmium (17.2) Lead (1540) Manganese (550) Vanadium (29.8) Zinc (1610)	Soil	IH site	Ingestion, inhalation	Workers, trespassers	Past, Current

[a] Comparison values provided in Table 4, parts per million (ppm)
[b] See Appendix C-Table B for individual polycyclic aromatic hydrocarbons (PAHs)

See Table 9 for completed off-site exposure pathways.

A completed past exposure pathway was also identified for off-site soils. Sampling was conducted in March 1995 in the elementary school yard and private residences to the south of the site (a total of six samples taken). Results from this study indicated the presence of PAHs and several metals in the surface soil. Table 5 lists these contaminants and their comparison values. See Appendix C, Table 4 for the complete listing of off-site PAHs.

The primary metals of concern are arsenic and lead. Arsenic levels range from 5.6 - 10.4 ppm, below the child chronic EMEG, but above the CREG of 0.5 ppm. The maximum concentration for lead was 393 ppm, below the 400 ppm EPA action level for residential areas (USEPA, June 1998). The route of exposure to area residents may be through ingestion of contaminated soil. The presence of vegetation decreases the likelihood of exposure to contaminated soils and dust. Most yards observed in this neighborhood have grass established around the house.

Sampling in June 1995 again indicated increased levels of metals, in particular arsenic and lead. The samples were taken from the elementary school yard, one residence, and at the western and northern borders of the site (a total of five samples). Children may have been exposed on the school play yard via incidental ingestion, and possibly inhalation of soil and/or dust. Area residents may have been exposed via ingestion and possibly inhalation of contaminated soil and/or dust. However, not enough information is available to conclude whether PAHs are migrating off of the site.

Table 9. COMPLETED EXPOSURE PATHWAY, INTERNATIONAL HARVESTER (IH)--OFF-SITE

Pathway Name	Source	Contaminant and Level (Max, ppm) [a]	Environ-mental Medium	Point of Exposure	Route of Exposure	Exposed Population	Time/ Date, if known
Surface Soil	IH	Total PAHs [b] Arsenic (10.4) Barium (286) Cadmium (2.0) Lead (393) Manganese (330) Vanadium (39.2) Zinc (159)	Soil	Residential yards	Ingestion, Inhalation	Area residents	Past

[a] Comparison values provided in Table 5, in parts per million (ppm)
[b] See Appendix C-Table D for individual polycyclic aromatic hydrocarbons (PAHs)

II. Potential Exposure Pathways

See Table 10 for potential on-site exposure pathways.

Air

Exposure to asbestos is included as a potential pathway. Asbestos was identified on the International Harvester site as a component of other materials, i.e. roofing tile and siding. The content of these asbestos containing materials (ACM) was estimated at 40% chrysotile. Ordinarily, asbestos contained in materials such as roofing tiles and siding is bound-up and is not a hazard. However, crushing or erosion of the ACM may have created respirable particles. Workers and other persons may have been exposed to asbestos via inhalation.

Table 10. POTENTIAL EXPOSURE PATHWAY, INTERNATIONAL HARVESTER(IH)-- ON-SITE

Pathway Name	Source	Contaminant and Level (Max, ppm) [a]	Environ-mental Medium	Point of Exposure	Route of Exposure	Exposed Population	Time/ Date, if known
Air	IH	Asbestos (chrysotile)	Air	IH site	Inhalation of particulate	Workers, trespassers	Past, during demolition

See Table 11 for potential off-site exposure pathways.

Surface Soil
Potential current and future exposure pathways exist for PAHs and various metals. It is possible that area residents could be exposed via ingestion of contaminated soils in residential yards.

Air
A potential past exposure pathway exists for workers, trespassers, and area residents. Exposure to asbestos would be via inhalation of particulate in the ambient air. A future potential pathway of exposure may exist during periods of demolition on the site.

Table 11. POTENTIAL EXPOSURE PATHWAYS, INTERNATIONAL HARVESTER (IH) OFF-SITE

Pathway Name	Source	Contaminant and Level (Max-ppm)	Point of Exposure	Route of Exposure	Exposed Population (No.{option}	Time/ Date, if known
Surface soil	IH	PAHs [a]	Residential yards	Ingestion, Inhalation, Dermal	Area residents	Current, Future
Surface soil	IH	Arsenic (10.4) Barium (286) Cadmium (2.0) Lead (393) Manganese (330) Vanadium (39.2) Zinc (159)	Residential yards	Ingestion	Area residents	Current, Future
Air	IH	Asbestos (chrysotile)	Residential areas close to the site	Inhalation of particulate	Workers, Area Residents	Past, Current, Future

[a] See Appendix C-Table D for individual polycyclic aromatic hydrocarbons (PAHs).

PUBLIC HEALTH IMPLICATIONS

A. Toxicologic Evaluation

In this section, health effects are discussed that could plausibly result from exposures to site contaminants. While the relative toxicity of a chemical is important, the response of the human body to a chemical exposure is actually determined by several additional factors, including the magnitude (how much), the duration (how long), and the route of exposure (breathing, eating, drinking or skin contact). Lifestyle factors (e.g., occupation and personal habits) have a major impact on these three elements of exposure. After exposure has occurred, individual characteristics such as age, sex, nutritional status, overall health, and genetic constitution will affect how a contaminant is absorbed, distributed, metabolized, and eliminated from the body. Together, all these factors help determine the individual's physiological response to chemical contaminants and what, if any, adverse health effects he or she may suffer as a result of the chemical exposure.

ATSDR's Comparison Values (non-cancer):

ATSDR has determined levels of chemicals that can reasonably be regarded as harmless, based on the scientific data the agency has collected in its Toxicological Profiles. The resulting comparison values and health guidelines (which include ample safety factors to ensure protection of sensitive populations) are used to screen contaminant concentrations at a site, and to select substances that warrant closer scrutiny by agency health assessors and toxicologists. (See Appendix D for a more complete description of ATSDR's comparison values, health guidelines and other values ATSDR uses to screen site contaminants.)

It must be emphasized, however, that ATSDR's comparison values and health guidelines do not represent thresholds of toxicity. They are merely screening values used to facilitate the initial selection of site-specific chemical substances (the so-called "contaminants of concern") for further evaluation of potential health effects. After the contaminants of concern at a site have been identified, they must then be individually scrutinized in more detail (considering all the different factors mentioned in the first paragraph of this section) to determine whether or not, under site-specific conditions, they represent a realistic threat to human health. Although concentrations at or below the ATSDR's comparison values may reasonably be considered "safe", it does not automatically follow that any concentration above a comparison value will necessarily produce toxic effects. In fact, ATSDR's comparison values are intentionally designed so as to be orders of magnitude lower than the corresponding no-effect levels determined in laboratory experiments, thereby, enabling health professionals to recognize potential public health problems before that potential becomes a reality.

For screening purposes only, ATSDR typically uses the lowest comparison value available (i.e., CREGs or other chronic exposure values) for the most sensitive, potentially exposed individuals (e.g., children or pica children). This degree of conservatism results in the selection of many contaminants as "chemicals of concern" that will not, upon closer scrutiny, be judged to pose any hazard to human health. However, ATSDR judges it prudent to use a screen that "lets through" many harmless contaminants rather than one that overlooks even a single potential hazard to public health. Even those contaminants of concern that are ultimately labeled in the toxicological evaluation as potential public health hazards are so identified solely on the basis of the maximum concentration detected. It is important that the reader keep this redundant conservatism in mind when considering the implications of ATSDR's toxicological evaluations.

ATSDR's Comparison Values (Cancer):

The Cancer Risk Evaluation Guide (CREG) is ATSDR's most conservative comparison value. The CREG is a media-specific contaminant concentration derived from the chronic (essentially, lifetime) dose of that substance which (according to an EPA estimate) corresponds to a maximum risk level of one excess cancer in a million people exposed over a 70-yr lifetime.

Note that this does not mean that exposures equivalent to the CREG are actually expected to cause one excess cancer in a million persons exposed over a lifetime. Nor does it mean that every person in an exposed population of one million has a one-in-a-million chance of developing cancer from the specified exposure. Such estimates of cancer "risk" refer to population risk only, i.e., they do not apply to any single individual. Originally developed as risk management tools for use in establishing relative cleanup priorities, quantitative risk assessments were never intended to serve as realistic predictions of adverse health effects. As stated in EPA's 1986 Cancer Risk Assessment Guidelines, "the true risks are unknown and may be as low as zero". Most cancer risk assessments are based on high-dose animal data, and theoretical extrapolation from such data to human risk are not a precise science. In many cases, due to species-specific or dose-dependent mechanisms, these animal data are known to be of questionable relevance to human risk.

In practice, the exposure assumptions on which EPA's cancer risk estimates and ATSDR's CREGs are based, often do not apply at contaminated sites. The size of the potentially exposed populations is usually too small for quantitative estimates of population risk to be meaningful from a public health perspective. For example, chronic, lifetime exposure to a substance at 100 times its CREG would correspond to a risk of 100 in a million or only 0.1 in a thousand. Since there is no such thing as one tenth of an excess case of cancer, such an estimate would have no meaning to a population of less than 10,000 people chronically exposed at that level for life. ATSDR's CREGs continue to be useful for screening carcinogenic substances at contaminated sites, just as EPA's quantitative cancer risk estimates continue to be useful for establishing relative cleanup priorities. However, since neither can be used to predict actual cancer incidence rates at any site, ATSDR relies instead on less-easily, misunderstood qualitative assessments of the likelihood that a carcinogenic hazard does or does not exist under site-specific conditions.

SITE-SPECIFIC CHEMICALS OF CONCERN:

Only those contaminants that have been detected in concentrations exceeding comparison values or were identified as concerns by the community are discussed in this section. In addition, since a contaminant must first enter the body before it can possibly produce any effect, adverse or otherwise, on the body, the discussion below will focus on contaminants to which actual exposures are known or likely to have occurred.

Substances of concern in soil at the Dutch Boy (DB) site were lead, PAHs, and PCBs. PCBs are not discussed further because concentrations did not exceed non-cancer values for adults or non-pica children and only slightly exceeded ATSDR's CREG. PAHs in soil generally exceeded available CREGs, but not available child and adult EMEGs. Average soil concentrations of lead on-site and on adjacent roadsides exceeded EPA's action level. Limited air data indicate that the level of asbestos in on-site air at the time of sampling exceeded ATSDR's CREG, but was below the EPA-estimated threshold for non-cancer lung damage by two-three orders of magnitude. Arsenic in on-site air may or may not have exceeded comparison values, since the detection limit of the method used was, itself, higher than ATSDR's CREG. (No non-cancer comparison values are available for arsenic and asbestos in air.) During the December 1996 sampling event, where air monitors were placed at four perimeter locations on the site, lead in air exceeded the National Ambient Air Quality Standard of 1.5 $\mu g/m^3$.

PAHs in soil at the International Harvester (IH) site were identified for further evaluation. The maximum concentrations exceeded available CREGs, but not available non-cancer comparison values. Arsenic was also detected in concentrations that exceeded the corresponding CREG, but not the chronic EMEG for adults.

With the exception of lead, on-site contaminants generally occurred at concentrations below the more relevant, non-cancer, comparison values. CREGs are based on daily, lifetime exposures (i.e. 70 years). ATSDR considers that those on-site contaminants that exceeded CREGs only (i.e., PAHs and PCBs in soil, and asbestos and arsenic in air) represent little or no hazard to public health off-site, due to the limited duration of potential on-site exposures and the attenuated concentrations off-site. Lead in soil, a significant public health hazard in the past, is less of a potential hazard today due to vegetative soil cover, more restricted access, and remediation activities that will continue in the future. The basis for these conclusions are discussed further below.

Dutch Boy:

Lead in Soil (On-Site): On-site exposure to lead-contaminated soil and debris at the Dutch Boy site posed a potential hazard to public health in the past, i.e., prior to the demolition of contaminated buildings and the removal of debris. Data for evaluating off-site exposures to site-related contaminants are limited and is considered indeterminate. However, based on the data that

was available for review, off-site exposures do not appear to have been associated with any readily identifiable public health hazard in the past; nor is any such public health hazard likely to exist now or in the future.

By 1986 standards, significantly elevated blood lead levels appear to have been limited almost exclusively to those individuals who were exposed on the site, *i.e.*, before highly-contaminated demolition debris was removed (e.g., during salvage operations). The nine highest blood lead levels recorded in the 1986 mass screening data that were submitted to ATSDR ranged from 31 to 70 μg/dL. (Thirty to 50 μg/dL is the generally accepted range for low-level lead toxicity). Since all personal identifiers were removed from that data, ATSDR can only assume that these samples correspond to those individuals (i.e., three adult male salvage workers, three children of one of those workers, two former Dutch Boy employees, and a teenage girl who lives near the site) who were diagnosed with "lead poisoning" between 1985-1986.

The mass screening data also indicated that five other individuals out of the 599 for whom ATSDR received test results had blood lead levels (25-29 μg/dL) that were greater than or equal to CDC's level of concern which, at that time, was 25 μg/dL. However, having no access to the personal identifiers associated with these five samples, ATSDR cannot speculate on the probable source of the causative exposures in these five cases but they are probably not related to acute exposures at the site. It can only be stated that the percentile ranking of these elevated levels (and, indeed, all exposures in the vicinity of the DB/IH sites) appears to have been intermediate between that of general population levels described by the second and third National Health and Nutrition Examination Survey (NHANES II, 1976-80 and NHANES III, 1988-91). The percentage of the tested West Pullman/Victory Heights population with virtually any given blood lead level was lower than the percentage of a national sample population with the same blood levels in 1976-80, and higher than a national sample population in 1988-91, as one would expect if the distribution of blood lead levels in West Pullman/Victory Heights were similar to that of the nation as a whole. Nevertheless, blood lead levels at West Pullman/Victory Heights in 1986 probably were generally higher than the national average in 1986 (whatever that may have been), if only because (as the NHANES data demonstrate) blood lead levels tend to be higher in urban populations.

For the present, the potential for off-site, as well as on-site, exposures to site-related contaminants is currently much reduced relative to conditions in 1986. The site is currently a fenced, empty lot overgrown with vegetation. Access is restricted. Potential for future exposures will be even further reduced by additional remediation activities that are planned by the U.S. EPA.

COMPARISON OF SITE-SPECIFIC DATA WITH NHANES II and III DATA

Percentile Ranking	NHANES II (1976-80)	DUTCH BOY (1986)	NHANES III (1988-91)
5th	7	5	1
10th	8	5	1
25th	10	6	2
50th	13	8	3
75th	17	12	5
90th	21	16	7
95th	25	21	8
98th	≥30	---	---
99th	---	30	10
99.5th	---	---	≥30

PAHs in Soil (On-Site): PAHs (15) in soil at the Dutch Boy site do not constitute a current or future hazard to public health. Currently, the site is an empty lot, overgrown with vegetation. Access to the site is effectively restricted and additional remediation activities are planned by U.S. EPA which will further reduce the potential for future exposures.

PAHs in soil at the Dutch Boy site did not constitute a probable past hazard to public health because neither the levels nor the exposure conditions were sufficient to produce any known adverse health effects in humans. The maximum values for PAHs detected in on-site soil at Dutch Boy are listed in Appendix C, Table A. Generally speaking, the non-carcinogenic PAHs were present in amounts that did not exceed comparison values for chronic exposure (RMEGs and non-cancer RBCs). The maximum (but not the minimum) recorded concentrations of the carcinogenic PAHs did exceed cancer-based comparison values (CREGs and cancer-based RBCs), but these comparison values are based on the assumption of long-term chronic exposure, a scenario which, if it applied to anyone, would have applied only to some fraction of the on-site workers. However, even for those individuals for whom such an exposure scenario may have been plausible, the maximum intake of total benzo(a)pyrene equivalents from on-site soil would not represent a health threat. A comparable example is the amount of exposure that these individuals would likely receive is no more than the benzo(a)pyrene intake associated (on average) with the daily consumption of one ounce of charcoal-grilled steak.

There is no evidence that any of these PAHs individually are carcinogenic to humans, especially not by the ingestion route. The most consistent result in rats and mice treated orally with relatively high doses of individual carcinogenic PAHs is tumors of the forestomach, an organ which humans do not possess (15). In monkeys, exposure to individual carcinogenic PAHs has not been very successful in inducing cancer (16). Dermal application of crude petroleum oil has caused cancer in subhuman primates, and prolonged inhalation exposure to high levels of complex PAH mixtures (e.g., cigarette smoke, coal tar pitch volatiles, and coke oven emissions) are associated with an elevated incidence of lung cancer in humans. However, no single PAH in these mixtures has been implicated as the causative agent, and it is likely that other agents, including promoters which typically exhibit a threshold, play a role on the overall carcinogenicity of these mixtures. That would explain why prolonged exposure to high doses of complex PAH-containing mixtures appear to be required to produce cancer in primates, including humans.

Asbestos in air (On-Site): Although the maximum level of asbestos measured in air in 1996 (0.0008 fibers/ml) exceeded ATSDR's CREG (17) for asbestos in air, this concentration is not likely to be associated with any adverse health. Chronic exposure at this level over an entire (70-yr) lifetime would correspond to 0.168 f-yr/ml. By comparison, several epidemiological studies have detected little or no increase in lung cancer risk until the cumulative dose of asbestos exceeds 25-100 f-yr/ml (17). (Note: the estimate of chronic, lifetime exposure includes a factor of 3 to convert from an 8-hr work day to a 24-hr day.) More relevant is the fact that no one has or ever will be exposed to asbestos in air at the DB site 24 hours a day for a lifetime. ATSDR therefore considers that asbestos in air does not represent a public health hazard at this site.

Arsenic in air (On-Site): Arsenic was not detected in air at the DB site during a 1996 sampling event. However, the detection limit (0.14 $\mu g/m^3$) of the monitoring method used was 700 times higher than ATSDR's CREG (18), the agency's only comparison value for arsenic in air. Thus, it is impossible to know whether arsenic in air on this occasion did or did not exceed the CREG. In either case, however, exposure conditions on-site will not correspond to those on which the CREG is based. In addition, it has been shown that the dose-response relationship between airborne arsenic and lung cancer in smelter workers is concave downward (18). This means that the incidence of lung cancer in these exposed workers was disproportionately lower at lower (inhalation) exposure doses. Arsenic in air is therefore unlikely to represent any apparent health hazard at the DB site.

International Harvester (On-Site):

PAHs in Soil: PAHs in soil at the IH site do not constitute a current or future hazard to public health. Currently, the site is an empty lot, overgrown with weeds and trees and access is restricted, although there are breaches in the fence that suggest occasional trespassing does occur. Also, additional remediation activities are planned by EPA which will further reduce the potential for future exposures.

PAHs in soil at the International Harvester site were significantly higher than those at Dutch Boy, but the health implications are largely the same. (See section above on PAHs in Soil at the Dutch Boy site.) The maximum concentrations of PAHs in on-site soil at IH were actually higher than the maximum concentrations detected in "black, oily sludge" from the bottom of on-site manholes, suggesting that these heavily contaminated "soil" samples would probably not qualify as the type of soil that might be incidentally (and, especially not intentionally) ingested by workers or trespassers. Therefore, these samples probably do not provide a realistic basis for an assessment of probable health implications.

Generally speaking, the non-carcinogenic PAHs did not exceed comparison values for chronic exposure (RMEGs and non-cancer RBCs). While the maximum recorded concentrations of the carcinogenic PAHs did exceed cancer-based comparison values (CREGs and cancer-based RBCs), the minimum concentrations generally did not. Based on the data presented in Appendix C, Table B, even average soil concentrations of PAHs at IH would have probably exceeded the relevant CREGs. However, cancer comparison values are based on an exposure scenario (i.e., long-term chronic exposure) that is not strictly applicable to this site. Also, as mentioned earlier, the evidence that PAHs may cause cancer in humans by the ingestion route is weak, at best. Therefore, ATSDR concludes that past exposure to PAHs in soil at the IH site are not likely to have caused adverse health effects in workers, and that current exposures to trespassers are even less likely to do so.

Asbestos in soil: There is strong evidence that inhalation exposure to asbestos (amphiboles more so than chrysotile) can cause lung cancer and mesothelioma in occupationally-exposed workers if the cumulative dose is high enough. However, the case for the carcinogenicity of asbestos via the ingestion route is much weaker, in animals as well as humans. In addition, the asbestos at this site may have consisted primarily of non-friable (non-crumbled or not brittle) chrysotile, i.e., a less carcinogenic form of asbestos in a less bio-available physical state. Combined with the limited potential for exposure (i.e., ingestion of on-site soil), these considerations suggest that asbestos in soil at this site is not likely to pose a public health hazard.

B. Health Outcome Data Evaluation

Blood lead screening was performed in 1996 on approximately ten children by the city of Chicago Department of Health. According to the city, all the values were less than 10 μg/dL.

C. Community Health Concerns Evaluation

- Are the following specific health concerns related to the elevated levels of the chemicals found at the Dutch Boy and International Harvester sites: asthma, allergies, aggressive behavior in children (especially high school age), cancer (breast and prostate), low birth rate, heart problems (neighbor has a pacemaker), rashes, kidney problems, and sarcoidosis?

None of the chemicals of concern identified at the Dutch Boy and International Harvester sites are known to cause any of the above-indicated human health effects. The sludge in basements reported by some residents may appear intermittently during periods of rain when the drains may back-up. The sludge in manholes on the site was reported to be similar to sludge found in some basements. This on-site sludge was analyzed and did contain some PAHs, metals, and VOC contaminants but not at levels likely to result in adverse health effects.

"Rashes" may be caused by a multitude of things. Sustained dermal contact with complex mixtures of PAHs (e.g., coal tar) can cause skin irritation, especially if the individual is allergic to them. However, this is not a relevant exposure scenario at the Dutch Boy and International Harvester sites.

It has been suggested by some investigators (19) that elevated lead levels may be associated with antisocial, delinquent, or criminal behavior. However, the relevant studies provide little support for this contention, since they do not control for any of the numerous genetic, psychological, and environmental factors known to be more strongly related to aggressive behavior. Environmental pollution is not an established contributing factor.

The relevance (or rather the lack thereof) of plausible exposures to on-site contaminants and the risk of cancer was discussed in the Toxicological Evaluation section of this document.

Sarcoidosis is a granulomatous disease of unknown cause.

CHILD HEALTH INITIATIVE

ATSDR recognizes that children are different from adults when exposed to contamination in their water, soil, air, or food. Children are at greater risk than adults from certain kinds of exposure to hazardous substances emitted from waste sites and emergency events. They are more likely to be exposed for several reasons. First, children play outside more often than adults, increasing the likelihood that they will come into contact with chemicals in the environment. Because they are shorter than adults they breathe more dust, soil, and heavy vapors close to the ground. Children are also smaller, resulting in higher doses of chemical exposure per body weight. The developing body systems of children can sustain damage if toxic exposures occur during certain growth stages.

Past Exposure

Dutch Boy

Different reports reviewed indicate that three children were diagnosed with high blood lead levels between 1985-1986. [ATSDR was not able to obtain original documentation of these elevated levels and relies on statements in previous reports.] These children reportedly were playing on the Dutch Boy site during the demolition of the buildings. The site was accessible to trespassers for several years prior to being fenced. Community residents state that the area was a common cut through for children on their way to the school bus stop. ATSDR recognizes that it is likely for

children playing on the site to have been exposed in the past to elevated soil lead levels found on the Dutch Boy site. Children could have been exposed via incidental ingestion or inhalation of contaminated soil or dust.

International Harvester
ATSDR identified a pathway in the past as a likely route of exposure for children on the International Harvester site. The abandoned site was unfenced for several years allowing access to the property. An elementary school is located approximately 625 feet from the site. As with the Dutch Boy site, this area was a common cut-through for area residents. Children playing on the site could have been exposed to PAHs and asbestos via incidental ingestion or inhalation of contaminated soil or dust on the site.

A past exposure situation was also identified for soil in residential yards. Children may have been exposed to PAHs and metals presumably via incidental ingestion of soil in yards near the former International Harvester site.

Current Exposure
Dutch Boy
ATSDR did not identify any current exposure situations for children at the Dutch Boy site. A fence surrounds the perimeter of the property, limiting access to contaminated areas on the site. A potential pathway does exist on the roadway adjacent to the northeast corner of the property. Children playing on the side of the road in this area could be exposed to elevated soil lead levels via incidental ingestion or inhalation of soil or dust.

International Harvester
There is a current potential exposure situation for children on the former International Harvester site. Significant breaches were apparent in the fence surrounding the perimeter of this property at the time of the site visit, particularly along the southern fence line facing the elementary school and residences. Poor fence integrity allows children access to the property. Children playing on the site could be exposed to PAHs, metals, and asbestos via incidental ingestion or inhalation of contaminated soil or dust on the site.

Future Exposure
Dutch Boy
A potential exposure situation exists for children in the future on the former Dutch Boy site. Children may be exposed during site remediation if contaminated dust blows off the site towards populated areas. Children could be exposed to contaminated dust via inhalation or incidental ingestion of settled dust. This exposure pathway will be eliminated if measures are taken during clean up activities to limit dust. ATSDR has recommended perimeter monitoring for lead and asbestos during further clean-up activities.

International Harvester
ATSDR identified a potential exposure situation in the future. It is possible that children may be exposed to PAHs and metals in the soil of residential yards via incidental ingestion. ATSDR has recommended better characterization of soils in residential yards. This sampling would give more information on the level of contaminants found in off-site areas. ATSDR recommends that persons who are concerned with the appearance of black oily sludge in their basement when it rains, should have it tested for contaminants.

CONCLUSIONS

Dutch Boy

- The Dutch Boy site represents a potential public health hazard to on-site workers and trespassers who were exposed to elevated levels of lead in the surface soil and debris in the past.

  -Significantly elevated blood lead levels appear to have been limited to those individuals exposed while on the site in the past.

  -The concentration of PCBs, asbestos, arsenic, and PAHs were not present at high enough levels and for a period of exposure in the past that would likely result in adverse health effects.

- Potential exposures to on-site contaminants are unlikely to exist currently or in the future since;

  - Current site security appears to be adequate to prevent casual entrance onto the site.

  - Potential exposures to these contaminants are currently reduced and due to limited access and on-site vegetative growth, soil movement is limited.

  - Additional remedial activity with proper air monitoring will further reduce potential future exposures.

- Off-site soil has not been fully characterized for lead contamination for past, current or potential future exposure, therefore, this site represents an indeterminate health hazard for off-site exposures.

International Harvester

- The International Harvester site represents a potential public health hazard to workers and trespassers who were exposed in the past to contaminants in the on-site soil. However, past exposures to these on-site contaminants are not likely to have caused adverse health effects.

- A potential exists for exposure to asbestos and PAHs via inhalation from on-site dust generated during remediation of the site.

- Limited data are available to further characterize current and future potential exposures to off-site surface soil contaminants and represents an indeterminate health hazard.

- Following analysis of available data, off-site exposures to site related contaminants do not appear to have been associated with any identifiable public health hazard in the past, nor is there any health hazard likely to exist now or in the future.

- Concern about fence security appears to be an ongoing issue, making the site easily accessible to trespassers.

RECOMMENDATIONS

Dutch Boy

1. Conduct perimeter air monitoring for lead, polycyclic aromatic hydrocarbons, volatile organic compounds, and asbestos during future cleanup of the site.

2. Provide community education regarding potential exposures to contaminants when trespassing onto the site and potential exposures to other sources of lead within the community.

3. Establish appropriate use of the property to the level of cleanup; i.e. industrial property uses if soil is remediated to EPA industrial clean-up levels.

4. Further characterize off-site residential soils for lead.

5. People who are concerned that they may have been exposed to high levels of lead and have not been tested, should have a blood test. Persons who have had their blood tested for lead, should contact the health department for individual results.

International Harvester

1. Eliminate on-site physical hazards.

2. Sample off-site residential areas and the elementary school yard for lead, arsenic, PAHs, and asbestos.

3. Monitor perimeter air for asbestos, PAHs, arsenic, and lead during future cleanup.

4. Provide community education regarding potential exposures to on-site contaminants.

PUBLIC HEALTH ACTION PLAN

I. Dutch Boy

Ongoing Actions
1. Remediation activities continue with EPA as the lead agency.

Completed Actions
1. Perimeter fencing installed.
2. Community health education on the contaminants of concern by Technical Outreach Services for Communities (TOSC).

II. International Harvester

Ongoing Actions
1. Remediation activities continue with IEPA as the lead agency.

Completed Actions
1. Perimeter fencing installed.
2. Community health education on the contaminants of concern by Technical Outreach Services for Communities (TOSC).
3. ATSDR letter to USEPA and IEPA regarding eminent physical hazards present on the IH site.

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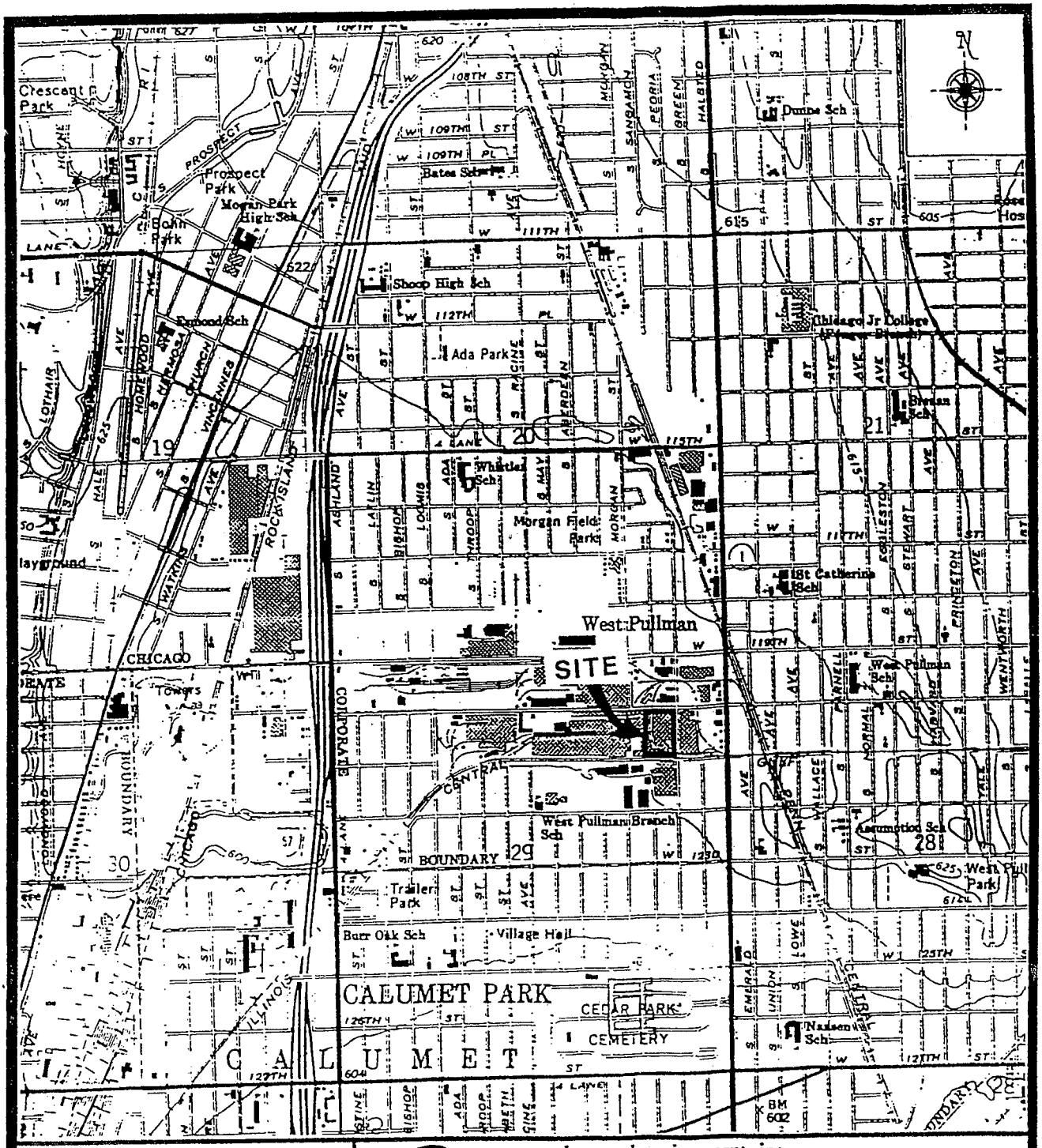
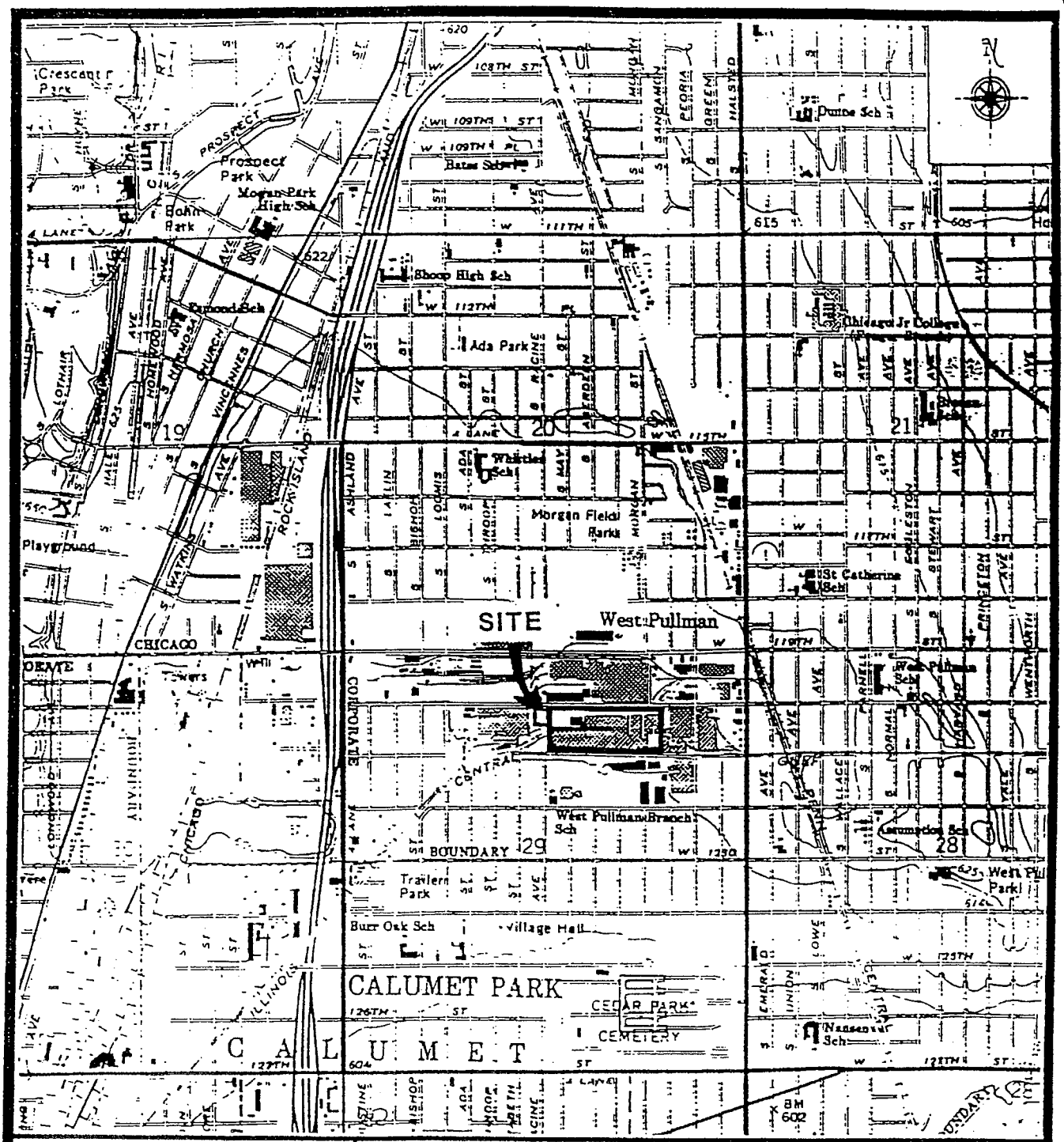
Appendix A
Maps



ecology and environment, inc.
Technical Assistance Team
Region V
111 W. Jackson Blvd., Chicago, Illinois 60604

TITLE: Site Location Map	FIGURE #: 1
SITE: Dutch Boy	TDD: T05-9505-011
CITY: Chicago STATE: Illinois	SCALE: 1:24,000
SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle: Blue Island, IL	DATE: 1963 PHOTOREVISED: 1973



ecology and environment, inc.
Technical Assistance Team
Region V
111 W. Jackson Blvd., Chicago, Illinois 60604

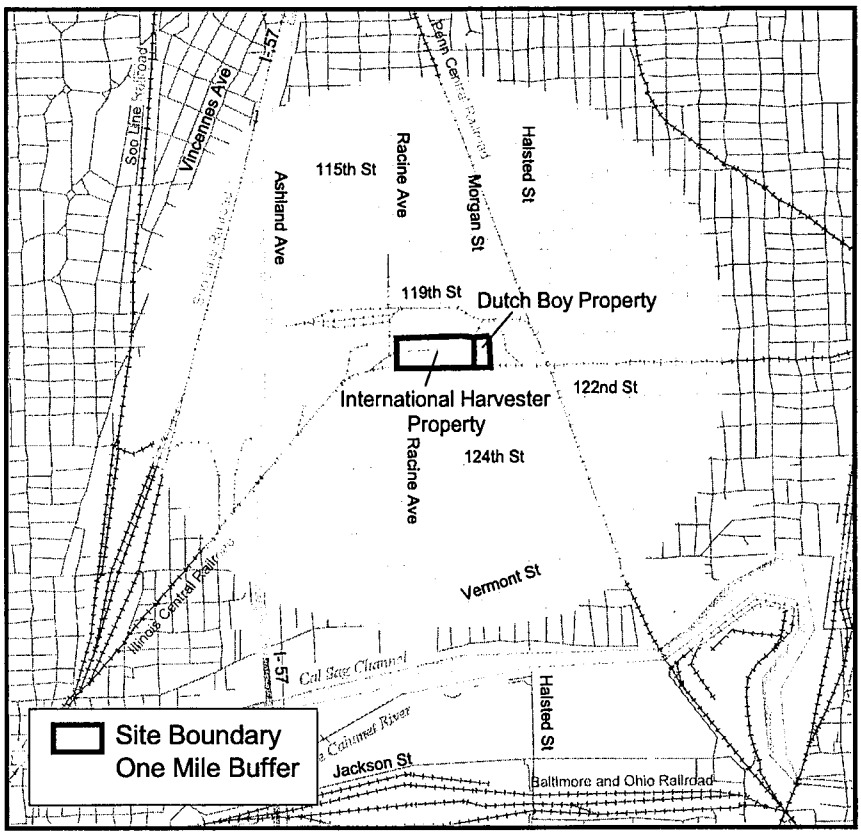
TITLE: Site Location Map	FIGURE #: 2
SITE: International Harvester	TDD: T05-9505-011
CITY: Chicago STATE: Illinois	SCALE: 1:24,000
SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle: Blue Island, IL	DATE: 1963 PHOTOREVISED: 1973

West Pullman Iron & Metal

INTRO MAP

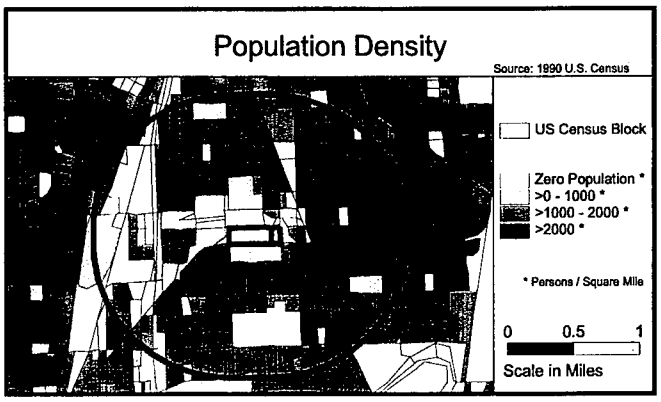
Chicago, Illinois

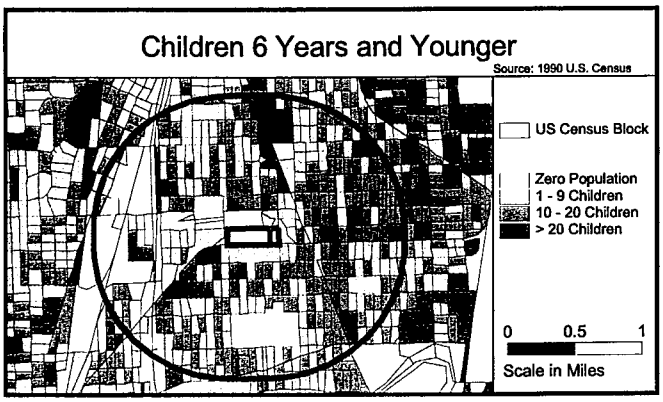
CERCLIS No. ILD005428651

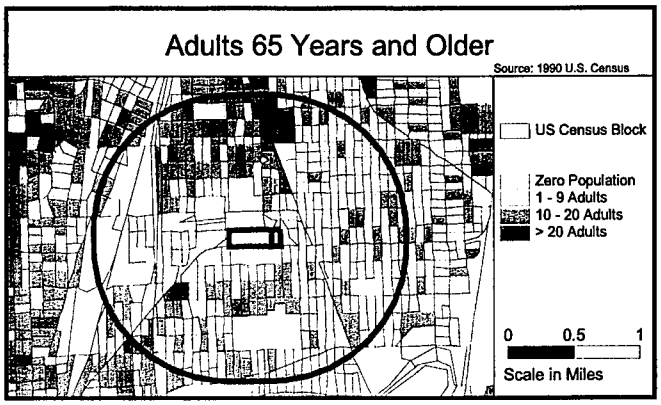


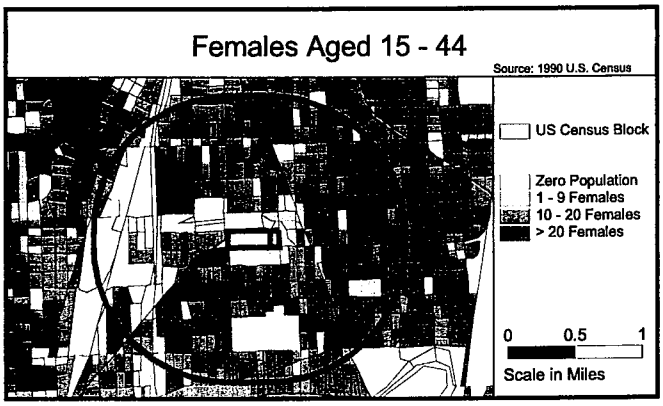
Cook County, Illinois

Demographic Statistics Within One Mile of Site*	
Total Population	36967
White	2071
Black	34424
American Indian, Eskimo, Aleut	32
Asian or Pacific Islander	48
Other Race	393
Hispanic Origin	812
Children Aged 6 and Younger	3826
Adults Aged 65 and Older	2735
Females Aged 15 - 44	9402
Total Housing Units	11514









ALD 093097

ATSDR GIS Spatial Analysis Activity

Appendix B

Letter from ATSDR to USEPA and IEPA regarding physical hazards at International Harvester

AUG 0 1 1997

Mr. William E. Muno
Director, Superfund Division
United States Environmental Protection Agency
S-6J
77 West Jackson Boulevard
Chicago, Illinois 60604

Dear Mr. Muno:

The Agency for Toxic Substances and Disease Registry (ATSDR) has been petitioned to evaluate health concerns related to two industrial sites by a member of the West Pullman/Victory Heights community in Chicago. One area of concern is the former International Harvester site, also known as Navistar. This site is currently enrolled in the voluntary Site Remediation Program with the Illinois Environmental Protection Agency (IEPA).

A visit to the petitioner was made on June 25, 1997. In the course of this visit, the petitioner brought the ATSDR team to the International Harvester site. Although the site is fenced, there are significant breaches in the fence along the Metralink rail line on the southern border of the site. Trespasser activity was noted by graffiti and a new cut in the fence along the northern border. According to the petitioner, children continue to enter the site through gaps in the fence along the Metralink rail line to explore the site and to cross over to the north side.

Exposed nails, glass shards, open water-filled manholes, water-filled basements, and what appears to be an old wastewater treatment tank, filled with water, were noted on the site.

ATSDR believes that these physical hazards at this unsecured site present a significant public health hazard. It is strongly recommended that immediate actions be taken to eliminate such hazards. Such actions should include:

a) covering and welding shut manholes or filling the holes with earth/sand;
b) preferably filling basements and other chambers with earth/sand or cordon off with fencing; and
c) repairing breaches in the fence, in particular along the Metralink rail line.

The accomplishment of these activities would enhance the security of the site from would-be trespassers, make it safer for future remedial workers, and decrease the potential of serious accidents from occurring.

If you have any questions, please do not hesitate to contact Jenny Dorley at (404)639-0627. We would appreciate your cooperation and attention to what we believe are significant public health hazards.

Sincerely yours,

Robert C. Williams, P.E., DEE
Director
Division of Health Assessment
and Consultation

cc:
Neelu Reddy, IEPA
C. Michael Moomey, IDPH
Louise Fabinski, ATSDR Region V
bc:
PERISB
DHAC
PRB

ATSDR/DHAC/PRB/JDORLEY:np 7/16/97
DOC: WPULL01.ltr

Appendix C

Polycyclic Aromatic Hydrocarbons Tables

Table A. Dutch Boy On-Site Soil PAH Levels 3 inches below ground surface[1]			
PAH[2]	Concentration (ppm)[3]	CV (ppm) [pica child/child/adult]	Source
Phenanthrene	0.79J[4]	--[5]	--
Anthracene	< 0.330	600 / 20,000 / 200,000	chronic RMEG[6]
Di-n-butylphthalate	< 0.330	200 / 5,000 / 70,000	chronic RMEG
Fluoranthene	1.24J	80 / 2,000 / 30,000	chronic RMEG
Pyrene	1.33J	60 / 2,000 / 20,000	chronic RMEG
Benzo(a)anthracene	0.76J	0.87	EPA-RBC[7]
Chrysene	0.84J	87	EPA-RBC
Benzo(b)fluoranthene	1.2J	0.87	EPA-RBC
Benzo(k)fluoranthene	< 0.330	8.7	EPA-RBC
Benzo(a)pyrene	0.86J	0.1, 0.087	CREG, EPA-RBC
Indeno(1,2,3-cd)pyrene	0.63J	0.87	EPA-RBC
Benzo(g,h,i)perylene	0.57J	87	EPA-RBC

[1] Data Source: Ecology & Environment, Inc. *Site Assessment for International Harvester/Dutch Boy Site, Chicago, Illinois.* August 1995.
[2] Polycyclic Aromatic Hydrocarbons (PAH)
[3] parts per million (ppm)
[4] "J" indicates an estimated value
[5] No value available
[6] RMEG = Reference Dose Media Evaluation Guide
[7] Environmental Protection Agency Region III, Risk Based Concentration (RBC), 1998

Table B. International Harvester On-Site Soil PAH Levels[1]			
PAH[2]	Concentration Range (ppm)[3]	CV (ppm) [pica child/child/adult]	Source
Naphthalene	9.3J[4] - 130	3 / 100	EPA-RBC[5]
2-Methylnaphthalene	0.150J - 7.7	3 / 100	EPA-RBC
Acenaphthylene	0.04J - 37J	--[6]	--
Acenaphthene	6.8J - 41 J	4 / 700	EPA-RBC
Dibenzofuran	0.09J - 22 J	310	EPA-RBC
Fluorene	40J - 43 J	80 / 2,000 / 30,000	chronic RMEG[7]
Phenanthrene	0.9 - 860	--	--
Anthracene	0.094J - 190 J	600 / 20,000 / 200,000	chronic RMEG
Carbazole	0.086J - 150 J	32	EPA-RBC
Di-n-butylphthalate	0.05 J	200 / 5,000 / 70,000	chronic RMEG
Fluoranthene	0.9 - 1,700	80 / 2,000 / 30,000	chronic RMEG
Pyrene	0.79 - 1,300	60 / 2,000 / 20,000	chronic RMEG
Benzo(a)anthracene	0.36J - 630	0.87	EPA-RBC
Chrysene	0.65J - 710	87	EPA-RBC
Benzo(b)fluoranthene	0.71J - 440	0.87	EPA-RBC
Benzo(k)fluoranthene	3.3J - 400	8.7	EPA-RBC
Benzo(a)pyrene	0.28J - 410	0.1, 0.087	CREG, EPA-RBC
Indeno(1,2,3-cd)pyrene	0.21J - 250	0.87	EPA-RBC
Dibenz(a,h)anthracene	0.054J - 140	0.087	EPA-RBC
Benzo(g,h,i)perylene	0.3J - 240	87	EPA-RBC

[1] Data source: IEPA. *Site Inspection Prioritization, International Harvester Site, Chicago, Illinois.* March 1995. No QA/QC accompanies this report.
[2] Polycyclic Aromatic Hydrocarbons (PAH)
[3] parts per million (ppm)
[4] "J" indicates an estimated value
[5] Environmental Protection Agency Region III, Risk Based Concentration (RBC), 1998
[6] No value available
[7] RMEG = Reference Dose Media Evaluation Guide

Table C. International Harvester On-site Manhole Data[1]

Compound	Concentration Range (ppm)	Comparison Value		Back-ground Levels*
		Value (ppm)[2] [pica child / child / adult]	Source	
PAHs:				
fluoranthene	110J[3] / 880	80 / 2,000 / 30,000	chronic oral RMEG[4]	0.450U
pyrene	130J / 730	60 / 2,000 / 20,000	chronic oral RMEG	0.450U
benzo(a)anthracene	49J / 370	--[5]	--	0.450U
chrysene	51J / 420	--	--	0.450U
benzo(b)fluoranthene	41J / 340	--	--	0.450U
benzo(k)fluoranthene	33J / 220	--	--	0.450U
benzo(a)pyrene	36J / 290	0.01	CREG[6], EPA B2	0.450U
	--- / 57J	--	--	0.450U
dibenzo(a,h)anthracene	20J / 180	--	--	0.450U
benzo(g,h,i)perylene				
Metals:				
barium	507 / 410	100 / 4,000 / 50,000	chronic oral RMEG	116.0
cadmium	4.2 / 6.4	1 / 40 / 500	chronic oral EMEG[7]	1.2B
lead	987 / 998	--	EPA B2	68.3
manganese	1,100 / 832	10 / 300 / 4,000	chronic oral RMEG	126.0
nickel	100 / 96.3	40 / 1,000 / 10,000	chronic oral RMEG	13.1
vanadium	25.5 / 25.5	6 / 200 / 2,000	intermediate oral	29.2
zinc	759 / 1,140	600 / 20,000 / 200,000	RMEG	103.0
			chronic oral RMEG	

[1] Data source: IEPA. *Site Inspection Prioritization, International Harvester Site, Chicago, Illinois.* March 1995. No QA/QC accompanies this report.
[2] parts per million (ppm)
[3] "J, U, B" data qualifiers, J= estimated concentration
[4] RMEG = Reference Dose Media Evaluation Guide
[5] No value available
[6] CREG = Cancer Risk Evaluation Guide
[7] EMEG = Environmental Media Evaluation Guide

Table D. International Harvester Off-site Soil PAH Levels[1]			
PAH[2]	Concentration (ppm)[3]	CV (ppm) [pica child/child/adult]	Source
Naphthalene	0.047J[4]	3 / 100	EPA-RBC[5]
2-Methylnaphthalene	0.068J	3 / 100	EPA-RBC
Acenaphthene	0.062J	4 / 700	EPA-RBC
Dibenzofuran	0.049J	310	EPA-RBC
Diethylphthalate	0.038J	2000 / 40,000 / 600,000	chronic RMEG[6]
Fluorene	0.084	80 / 2,000 / 30,000	chronic RMEG
Hexachlorobenzene	0.040J	.04 /1 / 10	chronic RMEG
Phenanthrene	0.120 - 1.0	--[7]	--
Anthracene	0.063J - 0.210J	600 / 20,000 / 200,000	chronic RMEG
Carbazole	0.038J - 0.120J	32	EPA-RBC
Di-n-butylphthalate	0.028J - .088J	200 / 5,000 / 70,000	chronic RMEG
Fluoranthene	0.260J - 1.6	80 / 2,000 / 30,000	chronic RMEG
Pyrene	0.220J - 1.5	60 / 2,000 / 20,000	chronic RMEG
Butlylbenzophthalate	0.1J	400 / 10,000 / 100,000	chronic RMEG
Benzo(a)anthracene	0.110J - 0.750	0.87	EPA-RBC
Chrysene	0.140J - 0.770	87	EPA-RBC
Di-n-octylphthalate	0.032J - 0.035J	--	--
Benzo(b)fluoranthene	0.140J - 0.770	0.87	EPA-RBC
Benzo(k)fluoranthene	0.087J - 0.530	8.7	EPA-RBC
Benzo(a)pyrene	0.110J - 0.660	0.1, 0.087	CREG[8], EPA-RBC
Indeno(1,2,3-cd)pyrene	0.092J - 0.440J	0.87	EPA-RBC
Dibenz(a,h)anthracene	0.028J - 0.160J	0.087	EPA-RBC
Benzo(g,h,i)perylene	0.086J - 0.410J	87	EPA-RBC

[1] Data source: IEPA. *Site Inspection Prioritization, International Harvester Site, Chicago, Illinois.* March 1995. No QA/QC accompanies this report.
[2] Polycyclic Aromatic Hydrocarbons (PAH)
[3] parts per million (ppm)
[4] "J" indicates an estimated value
[5] Environmental Protection Agency Region III, Risk Based Concentration (RBC), 1998

[6] RMEG = Reference Dose Media Evaluation Guide
[7] No value available
[8] CREG = Cancer Risk Evaluation Guide

Appendix D
Comparison Values

ATSDR's Comparison Values

ATSDR comparison values are media-specific concentrations that are considered to be "safe" under default conditions of exposure. They are used as screening values in the preliminary identification of "contaminants of concern" at a site. The latter is, perhaps, an unfortunate term since the word "concern" may be misinterpreted as an implication of "hazard". As ATSDR uses the phrase, however, a "contaminant of concern" is merely a site-specific chemical substance that the health assessor has selected for further evaluation of potential health effects.

Generally, a chemical is selected as a contaminant of concern because its maximum concentration in air, water, or soil at the site exceeds one of ATSDR's comparison values. However, it cannot be emphasized strongly enough that comparison values are not thresholds of toxicity. While concentrations at or below the relevant comparison value may reasonably be considered safe, it does not automatically follow that any environmental concentration that exceeds a comparison value would be expected to produce adverse health effects. Indeed, the whole purpose behind highly conservative, health-based standards and guidelines is to enable health professionals to recognize and resolve potential public health problems before they become actual health hazards. The probability that adverse health outcomes will actually occur as a result of exposure to environmental contaminants depends on site specific conditions and individual lifestyle and genetic factors that affect the route, magnitude, and duration of actual exposure, and not on environmental concentrations alone.

Screening values based on non-cancer effects are obtained by dividing NOAELs or LOAELs determined in animal or (less often) human studies by cumulative safety margins (variously called safety factors, uncertainty factors, and modifying factors) that typically range from 10 to 1,000 or more. By contrast, cancer-based screening values are usually derived by linear extrapolation from animal data obtained at high doses, because human cancer incidence data for very low levels of exposure simply do not exist, and probably never will. In neither case can the resulting screening values (i.e., EMEGs or CREGs) be used to make realistic predictions of health risk associated with low-level exposures in humans.

Listed and described below are the various comparison values that ATSDR uses to select chemicals for further evaluation, along with the abbreviations for the most common units of measure.

CREG	=	Cancer Risk Evaluation Guides
MRL	=	Minimal Risk Level
EMEG	=	Environmental Media Evaluation Guides
RMEG	=	Reference Dose Media Evaluation Guide
PEL	=	Permissible Exposure Limit (OSHA)
TLV	=	Threshold Limit Value (ACGIH)
ppm	=	parts per million, e.g., mg/L or mg/kg
ppb	=	parts per billion, e.g., μg/L or μg/kg
kg	=	kilogram (1,000 grams)
mg	=	milligram (0.001 grams)
μg	=	microgram (0.000001 grams)

L	=	liter
m^3	=	cubic meter (used in reference to a volume of air equal to 1,000 liters)

Cancer Risk Evaluation Guides (CREGs) are estimated contaminant concentrations in water, soil, or air that would be expected to cause no more than one excess cancer in a million persons exposed over a lifetime. CREGs are calculated from EPA's cancer slope factors.

Minimal Risk Levels (MRL) are estimates of daily human exposure to a chemical (i.e., doses expressed in mg/kg/day) that are unlikely to be associated with any appreciable risk of deleterious noncancer effects over a specified duration of exposure. MRLs are derived for acute ($\leq$ 14 days), intermediate (15-364 days), and chronic ($\geq$ 365 days) exposures, and are published in ATSDR's Toxicological Profiles for specific chemicals.

Environmental Media Evaluation Guides (EMEGs) are concentrations of a contaminant in water, soil, or air that are unlikely to be associated with any appreciable risk of deleterious noncancer effects over a specified duration of exposure. EMEGs are derived from ATSDR minimal risk levels by factoring in default body weights and ingestion rates. Separate EMEGS are computed for acute ($\leq$ 14 days), intermediate (15-364 days), and chronic ($\geq$365 days) exposures.

Environmental Protection Agency (EPA) values are similar to ATSDR's CREGs and EMEGs in that they are risk-based concentrations derived for carcinogens and non-carcinogens from RfDs and Cancer Slope Factors, respectively, assuming default values for body weight, exposure duration and frequency, etc. Unlike ATSDR values, however, they are available for fish, as well as for water, soil, and air.

Reference Dose Media Evaluation Guide (RMEG) is the concentration of a contaminant in air, water or soil that corresponds to EPA's RfD of RfC for that contaminant when default values for body weight and intake rates are taken into account.

Threshold Limit Values (TLV) are established by the American Conference of Governmental Industrial Hygienists (ACGIH). The TLV is the time-weighted average concentrations for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. Many of ACGIH's TLVs were adopted by OSHA for use as PELs, TLVs, and PELs, which were designed to protect healthy workers, are usually much higher than the health-based values of ATSDR and EPA, which were designed to protect the health of the general population, including the very young and the elderly. Although the ATSDR does not base any of its community health decisions on TLVs or PELs, it sometimes cites such values in Public Health Assessments merely as a means of putting concentrations of site-specific contaminants into a meaningful perspective for the reader.

Permissible Exposure Limits (PELs) are air standards developed by the Occupational Safety and Health Administration for the workplace. They are time-weighted average concentrations of contaminants considered safe for healthy workers over the course of an 8-hr workday and a 40-hr workweek. A PEL may be exceeded for brief periods, but the sum of the exposure levels averaged over 8 hours must be equal to or below the PEL.

Appendix E

ATSDR Response to Public Comments

ATSDR released the West Pullman/Victory Heights Public Health Assessment for public review and comment during the period from September 9 through October 25, 1998. ATSDR appreciates the written comments provided by residents of the West Pullman area of Chicago and the Illinois Department of Public Health. This section contains the comments received and ATSDR's response to these comments. General editorial comments were addressed, where appropriate, within the final document.

Comment: 1. Page 4, Paragraph 2 (DB)
It appears that only a very limited amount of sampling of residential properties has been accomplished, and ATSDR's summary should reflect that lack of data. However, based upon the Environ Draft EOC Report, it appears that significant lead contamination of soils near residential properties has occurred. This could have had a major impact on exposure of residents to lead.

Response: ATSDR realizes that a limited number of samples have been obtained from off-site residential soils and that is stated in the first paragraph on page 5 in the PHA. We do recommend further off-site soil sampling in the Recommendation Section of the document. It should be pointed out that residential soils could contain high lead content from other potential sources of lead, such as the existence of other industries in the area and from lead-based paints on older residences in the area. Also, although the use of lead-based gasoline has been discontinued, it has contributed to lead contamination in soil near road beds. We believe that informing the community of the many sources of lead-contaminated soil will help to minimize exposures.

Comment: 2. Page 4, Paragraph 3, Sentence 2 (DB)
Insufficient data are available to state that the concentrations of "polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) in on-site soil do not constitute a current public health hazard." It is known that there is extensive gasoline and diesel fuel contamination in the northwestern area of the site. Even if it could be concluded (which it cannot be) that this posed no risk to residents, it is not known if these levels are sufficiently high to pose a risk to workers during site remediation.

Response: Based on the data that were available for review, the levels of polycyclic aromatic hydrocarbons and polychlorinated biphenyls are not likely to result in adverse health effects in the future. At the Dutch Boy site, noncarcinogenic PAHs detected in the soil did not exceed health based comparison values for chronic exposures. Although the maximum concentration of carcinogenic PAHs exceeded the cancer-based comparison value, this value is based on a 70 year exposure duration which is not likely to occur because the site is being remediated. The PCBs that were detected at a concentration of 0.516 ppm at 3 inches below the ground surface did not exceed ATSDR's Chronic Environmental Media Evaluation Guidelines (EMEGs) for noncancer effects. Workers at the site during remediation activities are required to follow the Occupational Safety and Health Administration's rules to prevent exposures. Currently, access to the site is effectively restricted, the site is an empty lot, overgrown with vegetation, and additional remedial activities are being planned to reduce the potential for future exposures.

Comment: 3. Page 4, Paragraph 4 (IH)
As we stated above, to our knowledge no comprehensive (or even basic) residential sampling has been accomplished. The data for PAHs and zinc are not presented in the document. (Those data should be included in Table 5.) The location where samples were taken is not noted; this is important information on which to draw conclusions. Without this information, the conclusion that "exposure to the levels present at the site are not likely to cause adverse health effects" is unsubstantiated.

Response: Please see the response to the first comment which addresses the issue of limited sampling. Page 4, paragraph 4, refers to on-site surface soils, not off-site surface soils. The text has been amended. Contaminants are referenced in table 4, page 13. For locations and results, please refer to the IEPA document, *Site Inspection Prioritization, International Harvester Site, Chicago Illinois* of March 1995.

Comment: 4. Page 4, Paragraph 5 and 6 (IH)
The levels of contamination are not known for the extended period of time during which the site was unfenced. As stated in the PHA, "site security was not established until the summer of 1997, making it possible for pedestrians to enter the site." The community members have documented that the site was frequented until it was fenced. Even after the site was fenced, maintaining a secured property has been difficult. Photographs showing children playing on the site are available; photographs were taken both before and after the site was fenced. Given the high level of contamination on the site and the frequent access during the period when the site was unfenced, the conclusion that "adverse health effects are unlikely to occur" is unsubstantiated. If the concentrations of contaminants are high now, they must have been greater in the past, before site security. Additionally, ATSDR presents no justification on which to base the assumption that the duration of exposure was insufficient to result in any adverse health effects.

Response: ATSDR agrees that the level of contaminants in the past at the IH site is unknown, and stated on page 4 and on pages 12-13 and pages 28-31 that workers and trespassers were exposed to contaminants. With the exception of lead, however, on-site contaminants were found at concentrations below the more relevant, noncancer, comparison value (see page 25 of the PHA). Based on the data reviewed, the on-site contaminants that exceeded the cancer risk evaluation guides (PAHs and PCBs in soil, and asbestos and arsenic in air) were not considered likely to cause adverse health effects to individuals who occasionally gained access to the site. Individuals frequenting the site would not be continuously exposed to the maximum concentration of contaminants for the 70-year exposure period upon which the cancer guidelines are based.

Comment: 5. Page 5, Paragraph 1, Sentence 1 (IH)
The report states that "currently, for people trespassing on-site, both the Dutch Boy and International Harvester site represents (sic) a potential health hazard." This statement contradicts the repeated dismissals (by ATSDR) of the potential for historic exposures to PAHs and lead (see, for example, page 4, paragraphs 5 and 6 of the PHA). If the sites represent a current potential health hazard, given the extreme lack of data for historic concentrations, how did ATSDR determine that historic exposures did not cause health problems?

Response: The International Harvester site represents a current potential health hazard to people trespassing onto the site because the site still has contaminants at levels that exceeded ATSDR comparison values. ATSDR makes this statement to inform community members that they should not continue to go onto the site. ATSDR also recommends that remedial activities at the site continue. Please see the response to comment 4 for additional information about the site contamination.

Comment: 6. Page 5, Paragraph 3, Sentences 3, 5, and 6 (DB)
The PHA states that demolition and salvaging activities occurred from 1983 to 1986 and that "demolition activities were stopped after they were found to pose an imminent danger." However, if the lead poisonings occurred in 1985 and demolition activities occurred in 1986, it appears that demolition continued for a significant period after the threat to human health was known.

Response: On page 5, paragraph 3, sentence 6, the PHA states that after the IEPA was informed that people who had gained access to the site during demolition activities were diagnosed with lead poisoning and that the site activities posed an imminent danger to the surrounding community, the demolition activities were stopped .

Comment: 7. Page 5, Paragraph 4 (DB)
If some of the basements and open chambers on-site are now only "partitioned off with yellow tape," those locations must have been accessible to people entering the site before site security. No mention is made as to when the basements or open chambers were filled with soil. Is it not possible that, before site security, those areas were also accessible? What better location for children to explore? Those locations are likely places for "forts and the like, and would therefore represent a significant potential for exposure. In the past, as the debris was uncovered, the materials present in the pile could have been distributed both on and off-site by the wind. The PHA reports that presently the debris pile is only covered with torn plastic sheeting. As such, the materials in the pile continue to present a risk to human health as area residents may be exposed to these chemicals because of air deposition.

Response: ATSDR has previously commented on the potential for exposure to these on-site locations and agrees that until the site is further cleaned up, potential for exposure continues to exist and people should no longer go onto the site.

Comment: 8. Page 6, Paragraph 3
The Maple Park/Victory Heights Advisory Council is misidentified in the paragraph.

Response: Thank you for the clarification, the text has been amended to correctly identify the Maple Park/Victory Heights Advisory Council.

Comment: 9. Page 7, Paragraph 1
ATSDR seems to imply that the only adverse health effects with apparent clinical signs were the elevated blood lead levels noted in 1985 and 1986. However, ATSDR overlooks the pertinent questions. How complete were those sampling events? Was it possible that those individuals who were frequenting the site did not have their blood lead levels tested? How many individuals were tested during the 1985 and 1986 sampling events? Are those numbers sufficient to make any

statistically valid conclusions? Since the relationship between contact with the site and blood lead level cannot be made, no conclusions can be drawn from any of the sampling events.

Response: Although ATSDR requested more information regarding blood lead testing during this time period, we were unable to obtain additional information. We recommend that individuals who had their blood tested for lead contact the health department for results. People who have not been tested but believe that they may have been exposed to high levels of lead should have a blood test for lead.

Comment: 10. Page 8, Paragraph 2, line 10
To better assist the community in understanding the risk to their health, it would be useful for ATSDR to be more specific when describing health problems. Rather than referring to pica as an "uncommon behavior," TOSC suggest that ATSDR define the rate at which pica occurs in the general population and in this population, which is at risk. This would assist the community in understanding whether they need to be concerned with the additional risks associated with pica children.

Response: PICA behavior is defined as the craving or eating of bizarre substances that have no food value (such as starch, clay, ice, plaster, paint, hair, or gravel). Children between the ages of 1 and 6 and some pregnant women are most affected. Pica behavior varies widely in the population and may be due to an instinctive need to replace minerals absent in a persons diet, especially in persons eating clay that contains iron. The physiological factors are not well understood but may be related to poor nutrition, poverty, family history, anemia, or other factors. (www. thriveonline.com). Pica behavior during pregnancy usually ends with childbirth. Although pica behavior occurs for a limited period of time, providing a proper diet or nutrient replacement, child supervision, examining the home environment (especially for the presence of lead-based paints), can reduce or eliminate this behavior. For more information please visit ATSDR's web site (http://atsdr1.atsdr.cdc.gov:8080/HAC/HAGM/appd.html).

Comment: 11. Page 8, Paragraph 3, line 4
ATSDR introduces another criterion for lead, one that is higher than that set for this site, without any clear explanation. TOSC recommends that the 1,400 ppm lead level, as set by the U.S. EPA (UAO, March 1996) be used, for on-site soils.

Response: ATSDR has changed the 500-ppm lead level in the text to the current EPA (June 1998) lead level of 400 ppm for residential soils and 1,400 ppm level for industrial areas.

Comment: 12. Page 8, Paragraph 4
The UAO should be listed as the reference document for the actions "recommended" by U.S. EPA (a better term being "ordered" as they are found in an Administrative Order). In addition, the word "elevated" should be substituted for "increased" on the fifth line of paragraph 4.

Response: The EPA June 1998 document for action levels for lead at 400 ppm in residential soil has been referenced. ATSDR has replaced the word "increased" with "elevated" in the sentence in paragraph 4.

Comment: 13. Page 8, Paragraph 5
TOSC questions the argument that this "condition...does not apply to this site." In analyses conducted in 1993 (Simon Hydro-Search, Inc. Environmental Assessment Report, 120th and Peoria Streets, Chicago, IL, Nov. 1993. (as cited in the PHA)) it was found then that some of the PAH concentrations in on-site samples exceeded ATSDR's comparison levels. The concentrations of PAHs that would have occurred during and after the termination of the demolition operation are predictably higher than that in the 1993 samples. It is highly possible that, in the past, workers and the residents were exposed to much higher concentrations of PAHs, and as discussed previously, for extended periods of time.

Response: Based on the data available for ATSDR to review, the on-site contaminants that exceeded ATSDR CREGs (only PAHs and PCBs in soil, and asbestos and arsenic in air) were not considered likely to have caused adverse health effects in individuals who gained access to the site periodically. It is unlikely that people who periodically went onto the site would have been exposed to the maximum concentrations. The potential amount of time these people would have been exposed was less than the 70 years time on which ATSDR's CREGs are based.

Comment: 14. Page 9, Paragraph 1
ATSDR needs to acknowledge the presence of petroleum-type compounds on the DB site (EOC Report, ENVIRON, July 1997). Although specific compounds were not identified, the concentrations of gasoline-related organics (GROs) and diesel-related organics (DROs) exceeded 25,000 ppm in the northwestern corner of the site. It should also be stated by ATSDR that all VOC analyses conducted in 1997 by ENVIRON were inconclusive because the minimum detection limits were excessively high (25,000 ppb) in many cases.

Response: ATSDR is not clear about the reference to contaminants made in this comment. However, on page 11 under the heading of Sediment and Standing Water, ATSDR describes the report (EOC report, ENVIRON, July 1997) of 25,000 ppm of lead at 0 to 0.2 feet below ground surface detected in sediment from the former mill building. Also, VOCs and SVOCs were detected below the detection limits of 10 to 50 ppb and 10 ppb, respectively, in standing surface water samples taken in the mill building basement.

Comment: 15. Page 9, Table 1
ATSDR needs to discuss more completely the possible presence of PCBs on the site, especially given the likelihood that transformers were located on the site. Where were the transformers located? Were they located near the sample with a PCB level of 0.52 ppm? How many samples were tested for PCBs? Has the site been sufficiently characterized for the presence of PCBs?

In using the 500-ppm action lead level for residential soils, the ATSDR risk assessors use comparison values that may be too high to protect the health of the residents (Tables 1 and 3, page 12). In fact, if the lead concentrations in the soil and dust are 500 ppm, EPA's IEUBK model predicts that 18% of the children would likely have elevated blood lead levels. This value (18%) is three times the national average of children (6%) that have elevated blood lead. To provide an environment that would allow children in this community to have a blood lead level at the national average, as predicted by the IEUBK model, a soil (and dust) lead level of 200 ppm or less should be used for comparative purposes. It is important to recognize that the action lead level of 10

ug/L for children was not accepted as a no-effect level; instead it was accepted as an action level at which public health concerns can be managed. Many researchers do not consider this an acceptable level due to possible effects on children's mental development.

Response: ATSDR has reviewed previous site investigation reports from 1986 to the present and finds no reference to the presence of transformers on the Dutch Boy site. Polychlorinated biphenyls (PCBs) were sampled for and detected in soil samples taken at the site in 1995 (Ecology and Environment, August 1995). PCBs were detected in two samples (S003 located at the northwest corner of the former mill building and S004 located near the western area of the concrete dock area) at levels of 0.22 and 0.52 mg/kg (or ppm), respectively. ATSDR's comparison value for PCBs is 1 and 10 ppm for a child and an adult, respectively.

ATSDR has changed the 500 ppm lead level in the table to the current EPA (June 1998) lead level of 400 ppm. The EPA biokinetic model predicts that 5% of children will have blood lead levels above 10 μg/dL with average soil lead concentrations at 400 ppm. However, it should be pointed out that neither EPA's IEUBK model nor any other model can predict actual blood lead levels from soil lead concentrations. They can provide only theoretical estimates which, in the present case are far less accurate and useful than the biomonitoring data that were available for ATSDR's review.

Comment: 16. Page 9, Paragraph 2
ATSDR mentions only the results of sampling that was conducted in 1994. Sampling in 1997 by ENVIRON revealed lead concentrations exceeding 40,000 ppm near the loading dock (northwest sector) in soils up to 2' below grade. In soils and sediments at 2' to 4' below grade, the lead concentration exceeded 40,000 ppm in some locations. Even at depths of greater than 4' below grade, lead was found at concentrations greater than 40,000 ppm. It is imperative that ATSDR note these levels as they reflect the very high levels of contamination on the DB site.

Response: ATSDR states on page 8, paragraphs 3 and 4, that lead concentrations were highest in the western half of the site, particularly near the loading docks. ATSDR also mentions that sampling conducted in July 1997 by ENVIRON also indicated that lead concentrations were highest in the surface soils. This section has been amended to include mention that lead concentrations exceeded 40,000 ppm in subsurface soil samples from 1 to 4 feet below grade collected near the loading dock (ENVIRON, 1997, Table 1, SS08, SS09, SS10, SS11, SS12).

Comment: 17. Page 9, Paragraph 3
ATSDR notes that elevated VOC levels were detected on the DB site in 1987. Since those levels "were due to a surface spills" (according to ATSDR), the level of contamination must have been much higher at the time of the spills. Therefore, VOCs in surface soil may have been a health hazard in the past for the workers and the trespassers. This possibility needs to be identified in the risk assessment.

Response: No air data were available for review to determine possible past exposure to VOC levels that might have occurred during the surface spills. However, ATSDR did review the data that were available. These data demonstrated VOC levels in surface soil at 0.2 to 1 feet below ground surface (bgs) (E & E study 1995), subsurface soil at 1 to 8 feet bgs (sampled 1994, 1995),

and in sediment and surface water (1993). These sample levels were found to be below ATSDR's comparison values.

Comment: 18. Page 10, Paragraph 1
ATSDR states that "standing water no long occurs on-site." How was that statement tested? What data are available to substantiate it?

Response: During the site visit, ATSDR noted that standing water was not observed on the site. The sentence is misleading and has been deleted from the final document.

Comment: 19. Page 10, Paragraph 3
One should not dismiss the significance of air lead of 26.1 $\mu g/m^3$ (value measured during the 1996 demolition activities) at a site so close to a school and a residential area. Based on EPA's IEUBK model, at a 26.1 $\mu g/m^3$ air lead concentration, it is likely that more than 50% of the children exposed will have elevated blood lead levels. This figure is certainly not acceptable when nationally 6% of the children have elevated blood lead. Additionally, what is the "residual release" of lead? That is, what happened to the lead that left the site? Is information about wind direction available?

ATSDR compares the air quality data collected during the demolition activities conducted in 1996 to the OSHA permissible exposure limits. This comparison is invalid since the residents of this community are likely to be exposed for longer than an 8-hour period (used in promulgating the OSHA standard). As such, the National Ambient Air Quality Standard (NAAQS) of 1.5 $\mu g/m^3$ should be used for comparative purposes. While this level is more appropriate than the OSHA PEL, even at this level, neighborhood children would be expected to have elevated blood lead levels. The IEUBK model predicts that 18% of children will have elevated blood lead levels if the air lead concentration is 0.1 $\mu g/m^3$ and the soil and dust lead concentrations are 500 ppm.

Finally, ATSDR reports that one air sample had a lead concentration greater than 25 $\mu g/m^3$ (26.1 $\mu g/m^3$). This single value alone does not indicate whether the "true value" is either below or above the action level (25 $\mu g/m^3$). Therefore, the statement that "ATSDR does not consider this exceedance significant" is unjustified. On the contrary, one could argue that since lead toxicity occurred in workers during the 1986 demolition (as noted in the PHA on page 17), it is plausible that the elevated air lead concentration in combination with elevated soil lead levels posed a health problem to individuals residing in the proximity of the demolition site in 1996.

In addition, any examination of lead exposures associated with demolition activities needs to note that no monitoring or sampling occurred during the demolition activities from 1983-1986. Residents may have had exposures that lasted for years, not the shorter period during the 1996 demolition.

Response: In the first sentence on page 10, paragraph 3, under the heading Air, ATSDR states that, "No air monitoring or sampling occurred during the demolition activities from 1983-1986." The 1997 report by ENVIRON stated that the predominant wind directions are to the north and northeast (detailed in the 1996 Sampling and Analysis Plan, Environ). The results of the regression

analysis for the Dutch Boy site demonstrated that the concentrations of lead above 1,400 ppb were in soils sampled in the south and northeast transect (Environ, Figures 8 through16).

ATSDR did not dismiss the significance of the one air sample that measured lead at 26.1 $\mu g/m^3$ during the 1996 demolition activity, but puts it into the proper perspective. Harza Evironmental Services, Inc. (Harza) was hired by the city of Chicago to provide monitoring during the demolition activities at the Dutch Boy and International Harvester sites. The demolition activities were conducted from April 30, 1996, through May 23, 1996 (August 27, 1996, final report, Harza Environmental Services, Inc., Perimeter Air Monitoring During Demolition). The site perimeter air monitoring program conducted during the 4-week demolition activity consisted of continuous real-time monitoring for respirable dust levels and approximately 10 to 20 filter samples for respirable dust and lead per day. The action levels suggested by Harza and adopted by the city of Chicago for this project were 2.5 mg/m^3 for respirable dust and 25 $\mu g/m^3$ for lead (Dutch Boy site only). According to 29 CFR 1910.1025, the permissible exposure limit (PEL) for lead in air is 50 $\mu g/m^3$ as an 8-hour-time-weighted average (TWA) for cleanup at an industrial site. The PEL, according to the "Lead Exposure in Construction: Interm Final Rule", (29 CFR 1926.62), has an action level of 30 $\mu g/m^3$, and a PEL of 50 $\mu g/m3$, both as 8-hour TWA. Respirable dust measured as particulate has an OSHA PEL of 5 mg/m3 as an 8-hour TWA for industrial sites. Therefore, the action level for respirable dust at the site was set at one- half the OSHA PEL, or 2.5 mg/m^3.

Only one filter sample (26.1 $\mu g/m^3$), measured on Thursday, May 2, 1996, exceeded the action level for lead (25 $\mu g/m^3$). That sample was taken downwind at station 3, located at the northeast corner of the mill building, across Peoria Street from the Dutch Boy site, "not at a site so close to a school and a residential area." The respirable real-time monitoring range at this location was 0.06 to1.90 mg/m^3.

All other air sample results for lead and respirable dust, as well as the real-time monitoring respirable dust levels, were below both the voluntary action levels for the Dutch Boy/International Harvester Demolition project and OSHA PELs.

In addition to analyzing all of the environmental data available from 1987 to the present, ATSDR reviewed the data for community members who had their blood tested for lead in 1985, 1986, 1995, and 1996. Based on the data available for review, which included the results of several thousand tests for blood lead, ATSDR was unable to identify a clear relationship between the Dutch Boy site and any elevated blood lead levels off site, other than the 10 cases of acute lead poisoning identified in 1985 and 1986. The data fluctuated over such a wide range of area codes and years of sampling that it was not possible to identify any single site as the primary source of lead contamination. The relatively high background levels of blood lead in these 12 area codes were potentially due to past (and, in some cases, continuing) exposures to lead from other sources: paint chips in older housing, auto exhausts, and other light industrial sources in southeast Chicago.

Comment: 20. Page 12, Paragraph 2
ATSDR implies that since PCBs were detected in the soil in 1987, but were below detection limits in 1995, PCBs do not represent a threat to the community. This finding begs the question: Where

did the PCBs go? Since PCBs are not reactive, the PCBs either were distributed in wind-blown dust or were transported mechanically (movement of soil on feet, by children, etc.) These questions are important in terms of the impact of the PCBs on community health.

Response: According to the 1995 Ecology and Environment survey, PCBs were identified in surface soils on site (Ecology and Environment, 1995). PCBs were found at 0.52 ppm 3 inches below ground surface in only one of the samples taken on the Dutch Boy site. This level exceeded the CREG, but not the EMEG. PCBs were detected in 1987 at a maximum concentration of 18 ppm in surface soils at the International Harvester site. In June 1995, surface soils were sampled for PCBs. PCB levels were reported to be below the minimum detection limit.

Comment: 21. Page 13, Paragraph 3
It is inappropriate to use one-half of the OSHA PEL (25 $\mu g/m^3$) as the comparison value for air lead concentrations when children have access to the area (through breaks in the fence). Instead, the national average of 0.1 $\mu g/m^3$ air lead concentration should be used. With lead concentrations of 25 $\mu g/m^3$ in the air and 500 ppm in the soil (resulting in dust lead concentrations of the same level), the IEUBK model predicts that more than 50% of the children will have elevated blood lead levels. This is unacceptable when the national profile indicates that 6% of the children have elevated blood lead.

It is also inappropriate to use one-half of the OSHA PEL (2.5 mg/m^3) for respirable dust. Instead, either the NAAQS PM-10 value of 50 $\mu g/m^3$ (annual value) or the PM 2.5 value of 15 $\mu g/m^3$ should be used.

Response: Please see response to comment 19. Air sampling performed in December 1996 detected a maximum lead level of 3.1 $\mu g/m^3$ (PEL = 50 $\mu g/m^3$ for airborne lead) and real-time air monitoring measured airborne concentrations of respirable dust at 0.035 $\mu g/m^3$. The concentration of respirable dust was below the NAAQS PM-10 and PM-2.5 values of 50 $\mu g/m^3$ and 15 $\mu g/m^3$, respectively.

Comment: 22. Page 14, Paragraph 1.
ATSDR reports that a black oily sludge sample was taken from the bottom of an on-site (IH) manhole. This sludge is reported (by ATSDR) to be similar to that found in the basement of area residences after rainfall events. (A video documenting the presence of this sludge is available from the Council). As the concentrations of the contaminants in the on-site sludge exceeded ATSDR comparison levels, this material may represent a long-term exposure of many residents to the contaminants in the sludge. The black sludge needs to be removed immediately. The exposure and the potential health effects on residents should be assessed as soon as possible.

Response: During ATSDR's availability session, residents expressed concern about the sludge in their basements that occurred during periods of rain. The sludge in manholes located on the International Harvester site was reported to be similar to the sludge found in residential basements. Samples were taken in the manholes and analyzed for contaminants (IEPA, March 1995). ATSDR reviewed the data, and determined that the levels of PAHs and metals were below levels of health concern. However, ATSDR has determined that off-site contaminants are not clearly defined and

has suggested further off-site soil sampling to determine the extent of contamination.

Comment: 23. Page 14, Paragraph 3
ATSDR states that metals were detected in off-site surface soils taken at the Edward White Elementary School, a residence and along the western and northern borders of the IH site. The sampling locations and the concentrations of metals need to be provided to allow for a proper evaluation of the risk associated with these contaminants. ATSDR should consider that the presence of these contaminants might pose a long-term risk to the community.

Response: ATSDR has recommended that further soil sampling be performed off-site within the community. ATSDR will review these data when they becomes available.

Comment: 24. Page 15, Table 5
The alphabetic notations (B, J, etc.) used in this table and others (see Table 4 and Tables A, B, and C in Appendix C) should be defined or eliminated.

Response: ATSDR has made the appropriate changes to the final document.

Comment: 25. Page 15, Paragraph 2, line 4-6
The second sentence should be deleted. The last sentence should be reworded to read: "The analyses, conclusions and recommendations in this health assessment are only as valid as the data presented in the supporting documents. Where the quality control/quality assurance (QA/QC) measures used in preparing those supporting documents cannot be validated, any statements relating to those data are inconclusive."

Response: ATSDR reviews and considers the quality assurance(QA) and quality control (QC) data presented with the environmental data. In the public health assessment, ATSDR stated whether QA/QC information was available for the specific data reviewed for the document. No changes were made to this section because the conclusions made in this health assessment were determined by the availability and reliability of the data and information regarding sampling, sample analysis, and the concentration of contaminants identified.

Comment: 26. Page 17, Paragraph 2
ATSDR states, "These elevated levels (in two adults and three children) were attributed to the demolition activities at the Dutch Boy site." To our knowledge, this claim is made without factual data. Based on the existing data, a significant percentage of the children living in this community are likely to have had elevated body burdens of lead before 1983-1985 demolition activities. It is conceivable that the additional exposure to air and dust lead during the demolition brought the body burden of a small number of children above the apparent toxicity level. It is reasonable to predict that other children also had elevated levels of lead in their bodies, but that no apparent signs of toxicity were reported. Such a highly plausible scenario must not be dismissed. The blood lead concentrations from a "mass screening" in 1986 are not a good indicator of total lead body burden, because it was at least a year after the demolition activity and several years after the closing of the plant operations. Blood lead concentration is an acceptable indicator of lead exposure only when the exposure is consistent (i.e., the environmental levels are maintained) and concurrent with the blood sampling.

ATSDR states that "there are no supporting data" on which to base the assumption that "workers were also likely to be exposed via inhalation or ingestion of contaminated soil during the operation of this site." On the contrary, there is sufficient information pertaining to on-site contamination to assume on-site workers were exposed previously to several contaminants. The likelihood of past exposure should not be dismissed. In the absence of information on past exposure and given the blood lead concentrations measured at the time of exposure, one must consider the past exposure.

Response: ATSDR stated on page 17, paragraph 2, that people going to the site before, during, or after the demolition activities were exposed via inhalation of lead in air, or by dermal contact, inhalation, or ingestion of lead contaminated air, dust, or soil. It is not possible to speculate on the levels of lead in the community because data were not available prior to 1986. While blood lead levels do not give a complete indication of past exposure and the levels in the blood will vary, they can indicate whether the levels are above the levels of a background population or of an unexposed population. Except for the 9 persons identified with blood lead levels above 31 μg/dL, the blood lead levels obtained for residents in the West Pullman area, while higher than the National Health and Nutrition Examination Survey (NHANES III, 1988 to 1991), were not higher than the levels found in other urban populations. Industrial operations, leaded gasoline, and lead paint are all sources of lead exposure and contribute to continued chronic low levels of lead exposure. However, with remediation of the Dutch Boy site and education on the potential sources of lead near industrial sites and within the communities, the exposure to lead can be reduced and in some cases eliminated.

Comment: 27. Page18, Paragraph 2-4
Extensive trespassing through the contaminated sites before the area was fenced off has been reported. ATSDR states that the fence around the IH site has been difficult to maintain. We do know that children frequented the sites and as reported by the Council, children dug tunnels, made forts, entered the basements, and created dust as they rode their bikes and made trails. As such, the potential for exposure to the contaminants is great. The on-site lead and PAH levels observed in 1995 indicate potential health hazards at the Dutch Boy site for on-site workers and trespasses in the past. The soil lead concentrations detected in 1997, both on-site and off-site, indicate that lead is a past and a current potential hazard to the community through multiple routes of exposure.

Response: ATSDR agrees that the potential for past exposure existed for workers, people who accessed the site, and potentially off the site. Based on the preliminary soil data obtained from soil sampling conducted off the DB site, the potential for current and future off-site exposure is plausible and further characterization of areas surrounding the site is recommended. Additionally, the community should be well informed of the potential hazards of walking onto the site and other potential sources of lead contamination within the community.

Comment: 28. Page 19, Table 7
Why was the off-site soil exposure not considered as a possible source of past lead exposure? If its presence is evident now, its presence in the past is reasonably predictable.

Why was dermal contact omitted as a possible exposure pathway for surface soils and air? In the PHA (under "Surface Soil") it should be stated that workers and trespassers might have been exposed to the contaminants via ingestion, inhalation (of contaminated dust) and dermal contact

(with contaminated dust).

Potential off-site air lead exposure is possible when children play on the contaminated soil, even on vegetation-covered soil. Additionally, it is conceivable that children dug in these soils or played on the ground on grassy locations. This source of exposure must be considered.

Response: ATSDR identified in the health assessment media on and off the Dutch Boy site that was contaminated with lead. Dermal exposure to contaminants by workers was plausible, although not the major route of exposure. Lead is not readily absorbed into the body through the skin; rather, the main routes of exposure are by ingestion or inhalation of lead-contaminated soil. Tables 6 and 7 have been amended to include dermal routes of exposure. Because limited data existed, the past off-site exposure to lead in soil was considered indeterminant as to the source. Other potential sources of lead exist within the community from unleaded gasoline deposits along roadbeds, previously contaminated industrial sites, and paint chips containing lead-based paint. However, the table has been amended because the data that were available indicated that lead levels in soil sampled off site were above comparison values and potential exposures were plausible no matter what the source. Further remedial activity and vegetative cover will help reduce these potential exposures in the future.

Comment: 29. Page 20, Paragraph 2, line 3
Since ATSDR is considering the effects of off-site contamination, the data generated from all of the DB and IH reports should be pooled. Due to the proximity of the sites, it is impossible to ascertain if off-site exposure was the result of contamination from one or the other of the sites. Given this, ATSDR must consider the findings obtained in the ENVIRON EOC report (1997) which revealed off-site soil lead concentrations ranging from 46 to 16,200 mg/kg, with 43 of 66 samples exceeding 500 mg/kg.

Response: ATSDR has reviewed the ENVIRON EOC 1997 report and defined the potential for exposures to occur from contamination identified by limited off site sampling. ATSDR has recommended that further off site sampling be implemented to further define contaminants in soil surrounding both sites. It is not likely that anyone will be able to ascertain definitively which site contributed to which area of contamination since some contaminants were identified on both sites.

Comment: 30. Page 20, Paragraph 2, line 5
ATSDR states, "The presence of vegetation decreases the likelihood of exposure to contaminated soils and dust." That point should be re-assessed, because it provides no information indicating that the exposure is decreased to a level that no longer presents a health concern. A quantitative analysis of the exposure is required to make this statement meaningful.

Response: ATSDR disagrees that this information is not meaningful. It is well-documented that groundcover and vegetative characteristics of a site will influence the rates of soil erosion, percolation, and evaporation. This methodology has been used for containment and reduction of contaminated soil transport. This technology has been researched and used extensively in the application of ground covers for landfills (Design and Construction of RCRA/CERCLA Final Covers, EPA/625/4-91/025). Vegetative covers will decrease the amount of soil transported off the site. Other methods of reducing exposures to contaminants, such as further site remediation

and denying access to the site, will help to further reduce the amount of exposure likely to occur in the future. For more information community members may contact the Soil Conservation Service of the U.S. Department of Agriculture, or there are many Internet web sites that provide examples of innovative treatment technologies used for soil remediation and thereby reduce potential exposures.

Comment: 31. Page 20, Table 8
Both present and future exposures to citizens may occur from access gained through gaps in the fence. Keeping the fence intact has been a long-term problem.

Response: ATSDR agrees that it is imperative that the fence be maintained to prevent people from going onto the site. In addition, the community should be informed via flyers and during community meetings that the sites still are potential health threats until they are cleaned up further.

Comment: 32. Page 20, Paragraph 4
ATSDR states, "However, not enough information is available to conclude whether PAHs are migrating off-site." On the contrary, elevated concentrations of PAHs were found in off-site soil samples collected in 1995 (Table D), 12 years after the cessation of the operation. The black oily sludge, which may contain PAHs, continues to back up into the basements of residences even now! There is not only the possible past off-site PAH exposure, but also possible present "indoor" exposures.

Response: ATSDR made the statement because the few soil samples and limited data available; off-site sampling was considered to be limited. PAHs detected in off-site soil samples were not above comparison values established for pica child, child, and adult exposures. Only the maximum concentration of benzo(a)pyrene (0.660 ppm) was above the EPA risk-based comparison value (0.087 ppm). On-site PAH concentrations in soil were above comparison values. ATSDR has recommended that further soil samples be obtained in residential areas near the site to characterize the extent of contamination. However, it must also be pointed out that while the level of contamination can be defined, the source of the contamination may be difficult to locate because there are other possible sources of PAH contamination in industrial areas.

Comment: 33. Page 21, Table 9
Table 9 should state that potential exposures may have occurred in the past, may be occurring in the present and may occur in the future. This is because off-site soil is still contaminated (Table D) and because of the presence of the black oily sludge, which may be contaminated, in area residences.

Response: ATSDR states in Table 9 that a completed exposure pathway existed in the past for off-site surface soil. In Table 11, ATSDR states that a potential pathway exists currently and in the future for off-site surface soil. This statement was made because preliminary sampling data indicated that off-site soils were contaminated and further sampling was necessary to identify those areas near the site.

Comment: 34. Page 23-24, Paragraph 4
We agree that a conservative approach must be taken in order to protect human health. However,

we do not agree that these chemicals should be viewed as "harmless contaminants." If these chemicals were harmless, then why would EPA mandate and enforce drinking water maximum contaminant levels (MCLs) for many of the same chemicals? Many of the MCLs are very low: in fact, the maximum contaminant level goal (MCLG) for lead is zero.

Response: As a matter of policy, EPA's MCLGs are set at zero for virtually all compounds that are known to be carcinogenic in animals, regardless of the doses required, the mechanisms of action involved, or the availability of corroborating evidence in humans. However, almost half of all substances tested, whether natural or man-made, give positive results in carcinogenicity bioassays conducted at the maximum tolerated dose (MTD). For most of these "conditional" animal carcinogens, there is no evidence that they might be carcinogenic to humans under more realistic conditions of exposure. ATSDR's health assessors distinguish carefully between regulatory policy and basic, biological science, and between risk assessment and health assessment, if the information they provide is to be truly useful to either the EPA or the general public.

The most fundamental principle of toxicology is encompassed by the oft-quoted phrase, "the dose is the poison." Conversely, the dose also determines whether or not a given chemical is "harmless," or even therapeutic. Any chemical can be harmful, if the dose is high enough, and harmless, if the dose is low enough. This principle is also the rationale behind environmental regulations, the goal of which is to ensure that human exposures to potentially hazardous substances will be sufficiently low as to render them effectively "harmless." ATSDR's comparison values enable its health assessors to identify the great majority of these "harmless" substances (as defined by their maximum concentrations) so that attention can be focused on those substances that pose a less obvious degree of "hazard." Without such screening tools, effective public health assessment would be virtually impossible.

Comment: 35. Page 24, Paragraph 4
The argument presented here begs the question: Should U.S. EPA not enforce drinking water MCLs for communities having a population of 10,000 or less, since "there is no such thing as one tenth of an excess case of cancer"? A risk of one in 100,000 does not preclude the possibility that at that concentration, the chemical of concern will cause multiple cases of cancer in the community (of 10,000). Conversely, it does not mean that in another community (population 700,000) seven additional cases of cancer will result because of exposure of the population to this contaminant. This entire paragraph needs to be rewritten to better explain to the community the relevance of risk-based criteria.

Response: In fact, the first two introductory pages of the toxicological assessment and all of Appendix D (Comparison Values) were expressly designed to better explain to the community the relevance of risk-based criteria. Because it is the purpose of ATSDR's public health assessments to characterize the human health implications of site-specific chemical contamination under site-specific conditions of exposure, the "argument" referred to by the respondent actually has no bearing on purely regulatory decisions based on nationwide standards such as MCLs. It was intended, rather, to address a common misunderstanding of the statistical rationale underlying such standards. That common misunderstanding is exemplified by the respondent's statement that "a risk of one in 100,000 does not preclude the possibility that, at that concentration, the chemical of concern will cause multiple cases of cancer in the community (of 10,000)." Actually, it does

preclude that possibility, since the reported risk represents an upper bound and it is entirely possible, even likely in many cases, that a given "chemical of concern" will, in fact, cause no cancer at all, under conditions of low-level, environmental exposure.

As stated elsewhere in the first two pages of the toxicological evaluation section, comparison values (including MCLs and virtually all other health-based benchmarks) do not represent strict demarcations between hazardous and nonhazardous levels. In particular, cancer-based comparison values and this most especially includes EPA's quantitative cancer risk assessments and the comparison values based on them are designed to identify hypothetical population thresholds corresponding to acceptable levels of risk (arbitrarily defined as 10^{-6}), thresholds that do not apply to any real individual. A hypothetical risk of one excess cancer in a population of one million (to which ATSDR's CREGs correspond) implies that a single individual in a population of 1,000,000 would get cancer, while no excess cancer risk would exist for the remaining 999,999. However, it is unlikely since this type of susceptibility would be incompatible with life or, at least, with surviving to adulthood. Accordingly, all such quantitative cancer risk assessments are qualified by the caveat that "the true risk is unknown, and may be as low as zero" (EPA, 1986). Thus, notwithstanding the implications of the term itself, "quantitative cancer risk estimates" do not actually estimate (let alone "quantify") true cancer risk. That is why EPA stipulates that they cannot be used to predict cancer incidence in exposed populations (EPA, 1986).

These considerations in no way invalidate regulatory practices designed to conservatively protect a U.S. population of over 300,000,000 people. In the absence of any reliable data in the relevant low-dose region of the dose-response curve, such regulatory practices must, necessarily, be based on conservative assumptions and inferences as surrogates for the unavailable data. Perceived inconsistencies occur only when these conservative assumptions and inferences are misconstrued as scientific "facts" that actually do not exist and probably never will. It is precisely because protective comparison values alone cannot predict human health effects that, in 1980, ATSDR was created to provide both EPA and the general public with supplemental assessments of the human health effects that could actually result from exposure to site-specific contaminants. When done properly, these assessments are based on "the best medical and toxicologic information available," and distinguish clearly between fact, inference, and assumption (PHAGM, 1992, pg. 7-4).

Comment: 36. Page 25, Paragraph 4
"ATSDR considers that those on-site contaminants that exceeded CREGs only (i.e., PAHs and PCBs in soil, and asbestos and arsenic in air) represent little or no hazard to public health off-site, due to the limited duration of potential on-site exposures." That statement may be accurate for PCBs and asbestos, if fences eliminated access to the site. However, the statement is not true for past exposure, during operation and before the areas were fenced off. In addition, the statement may not be true for current exposures as black oily sludge is still backing up into houses.

Response: As indicated in the statement quoted by the respondent, these substances "represent little or no hazard to public health off-site" because of the "limited duration of potential on-site exposures." All cancer risk assessment values are based essentially on lifetime exposure. However, because ATSDR was specifically petitioned to address the public health implications of potential exposures to these sites, the only relevant, site-specific exposure scenarios are (1) acute on-site exposures incurred by trespassers, and (2) off-site exposures that will be very much lower.

The last part of the statement in question (which was not quoted by the respondent) referred to "the attenuated concentrations off-site" as another reason for the inapplicability of the CREGs for on-site contaminants.

Comment: 37. Page 25, Paragraph 5 (continued on P26)
Concerning the Dutch Boy site, ATSDR states that "based on the data that was available for review, off-site (lead) exposures do not appear to have been associated with any readily identifiable public health hazard in the past." ATSDR provides little scientific basis for this statement, and for good reason: critical information is lacking to evaluate historic contamination levels and historic exposures. Nobody knows the extent to which over 43 years of operation of the Dutch Boy facility, people were exposed to on-site or off-site contaminants. TOSC suggests that, because so little is known about past "exposure conditions," the conservative assumption, one that is protective of human health, would be:

- The Dutch Boy site has been repeatedly accessed by children during periods when lead was present in surface soils at high concentrations.
- The type of activities that were carried out on the site is unknown, but the community members indicated that such activities as riding bikes, playing ball games, digging in soils and other activities that actively disturb soils occurred on the Dutch Boy site.
- Because of the uncertainties associated with historic contamination levels and historic exposures, no definitive conclusions can be made on those issues. However, the present high on-site and off-site lead concentrations indicate a strong likelihood for historic exposures to lead.

Response: It is reasonable to expect that young children would have been actively excluded from the Dutch Boy site when it was an active industrial facility. The significantly elevated blood lead levels that were documented in 1986 were the result of salvaging operations being conducted amidst contaminated materials (which have since been removed), and not of "riding bikes," or "playing ball games." The potential for adverse health effects is a function of the magnitude and duration of exposure, and not of the mere "likelihood" of exposure. If the casual childhood activities referred to by the respondent had, in fact, been associated with toxicologically significant levels of exposure, then one might have expected the magnitude and frequency of elevated blood levels in area codes near to or encompassing the site to have been significantly higher than those in area codes farther away from the site. This, however, was not the case. The frequency of elevated blood levels in area codes 60628 and 60643 was within the range of those in 10 other 606-area codes in 1995 and 1996. The blood lead levels in area code 60628 (which contains the Dutch Boy and International Harvester sites) during 1995 and 1996 was also comparable to that in 1986. Although the frequency of elevated blood lead levels declined considerably over the course of the 3 years of sampling, the change was not specific to the area surrounding the Dutch Boy/International Harvester site, or even the 12 area codes studied. Indeed, the decline has occurred nationwide.

This is not to say that the frequency of elevated blood leads in the12 area codes was not undesirable, because it is. However, based on the data available for its review, which included the results of several thousand tests for blood lead, ATSDR was unable to identify a clear relationship

between the Dutch Boy site and any elevated blood lead levels off site, that is, other than the nine well-publicized cases of acute lead poisoning. Indeed, the available data fluctuate over such a wide range between the various area codes and years of sampling that it was not possible to identify any single site as the primary source of lead contamination. The relatively high background levels of blood lead in the 12 area codes were most probably due to past (and, in some cases, continuing) exposures to lead from, for example, paint chips in older buildings, auto exhausts, and any number of other industrial sources in southeast Chicago.

Comment: 38. Page 26, Paragraph 1
Firstly, no sufficient effort was ever made to identify the public health hazards associated with lead exposure. Secondly, it is more than likely that women of reproductive age have been exposed to elevated concentrations of lead in the soil, dust, and air. For the lead exposure in children, one should also consider the maternal body burden during pregnancy when lead can be transmitted from mother to fetus. Consistently throughout the PHA, ATSDR has failed to acknowledge the past exposure. The risk assessor could not, and shouldn't even try to explain the problem away stating, "However, based on the data that was available for review, off-site exposures do not appear to have been associated with any readily identifiable public health hazard in the past: nor is any such public health hazard likely to exist now or in the future."

Response: In addition to analyzing all of the environmental monitoring data available from 1987 to the present, ATSDR reviewed the results of over 1,000 blood leads screened in 1985 and 1996, over 19,000 in 1995 and over 23,000 in 1996. Whether this constitutes a "sufficient effort" in the minds of some, it was, nevertheless, all that ATSDR could do in the absence of more data. However, the fact that all personal identifiers were removed from these data severely limited the specificity of any conclusions that could be drawn from them. Even under the best of circumstances, it is seldom a simple, straightforward matter to establish a causal link between any one individual's health problem and one specific source of exposure. An exception would be acute episodes such as the one that lead to nine cases of lead poisoning in 1986.

Transfer of lead from mother to fetus occurs normally in every pregnancy, which is one reason why blood lead levels typically start out relatively high in the first few years of life. Sometime around puberty, lead levels normally tend to reach a lifetime low as the developing skeleton removes lead from the systemic circulation. Lead then climbs slowly over the next two to three decades, reflecting cumulative adult exposure. It was unnecessary to speculate about the relative contribution of maternal lead to a child's total exposure because data from the blood lead screens of 1985, 1986, 1995, and 1996 integrated exposures from all sources.

In the Pathways Analysis section, it is stated that "A past completed exposure has been identified for deposition of airborne lead onto surface soil on the Dutch By site," and that "persons going on to the site during or after the demolition activities of 1983-1985 were exposed via inhalation or ingestion of contaminated air, dust or soil." In the same paragraph, ATSDR alluded to the likelihood that "workers in the plant when it was operational were also exposed via inhalation or ingestion of contaminated air, dust, and soil." However, as indicated in the sentence immediately following, actual data in support of this reasonable assumption simply were not available. Since mere "exposure" to lead, which is a natural, elemental component of all soils, is both inevitable and universal, it was not the purpose of this public health assessment to either "acknowledge" or refute

the self-evident fact of past exposure. Rather, it was ATSDR's purpose to determine whether those exposures (as well as current and future ones) were likely to have been sufficiently high to produce adverse health effects and, if so, to characterize as far as possible the relationship of such exposures to the site in question.

Finally, it was the intention of the passage quoted by the respondent to characterize, insofar as the available data would allow, the extent of the problem, and not to "explain away the problem." Virtually all of the documented, elevated exposures that were clearly attributable to the Dutch Boy site involved on-site exposure. Based on the available data, ATSDR was unable to conclude that off-site exposures were likely to be associated with any readily identifiable adverse health effects. Furthermore, given the currently limited access to the site, and the latter's ongoing remediation, it is reasonable to conclude that the site is not likely to pose any public health hazard, either now or in the future. This is not to say, however, that lead exposure in this area will cease altogether or that other sources of excess lead exposure do not exist in the larger area surrounding the Dutch Boy/International Harvester sites. Background levels will, no doubt, remain relatively high throughout southeast Chicago, as they tend to do in similar urban areas across the country.

Comment: 39. Page 26, Paragraph 2
Again, we wish to emphasize that, to our knowledge, there was not a sufficient extent of blood lead sampling conducted in 1986. While we might be able to state that those individuals with elevated blood lead levels were exposed on-site, we cannot state that these were the only individuals exposed or that those were the only individuals with elevated blood lead levels. Additionally, the PHA needs to clarify the number of people with lead toxicity (previously stated on page 5, paragraph 3 of the PHA, as five, here the PHA states 5 adults and four children).

Using 1986 standards for risk evaluation for lead is unacceptable. An action level of 10 μg/dL should be used to evaluate the children's blood lead, rather than 25 μg/dL. Unfortunately, using blood lead as an indicator of past exposure is not acceptable. Blood lead only reflects body burden when exposure has been at constant environmental levels and is still ongoing.

In the past two decades, the percentage of U.S. children with elevated blood lead levels has dropped from 88% to 6%. Blood levels in children of this community should have followed a similar trend of decline if the environmental impact from the site contamination was negligible. Site-specific children's blood lead levels, which reflect only current exposure, should be compared with recent national data reported in, for example, "America's Children: Key National Indicators of Well-Being, July, 1998." The most that one can conclude based upon the existing information is that there is insufficient data to predict the blood lead levels of children in this community, and no test was performed to determine the total lead body burden to indicate past exposures. As for current lead exposure, the known soil lead levels, on-site and off-site, and the likelihood of elevated maternal burden due to long-term exposure to lead provide sufficient evidence for one to be concerned over the current children's blood lead levels. A community-wide blood lead screening of children should be recommended by ATSDR.

The lack of apparent signs of toxicity does not negate the possibility, however small, that the blood lead levels were sufficiently high as to cause low scores on cognitive ability and decreased nerve conduction in children, high blood pressure in middle-aged men, and increased likelihood of pre-

term deliveries in women. The reported five cases of apparent lead toxicity do not eliminate the possibility of developmental and nervous system toxic effects in the rest of the community.

Response: ATSDR can analyze and make health recommendations based only on data that both exist and are available for review.

As noted in the PHA, the 5 people with lead poisoning who were identified on page 5, paragraph 3, were diagnosed from 1985 to1986 and had been on the Dutch Boy site during the period when demolition activities were occurring. An additional four people were diagnosed in 1986 during an extensive screening program.

The 1986 standards were applied to the data because (1) the blood lead levels themselves were specific to 1986, and (2) the 1986 standards are more consistent with levels generally recognized by the scientific community as being associated with health effects that are readily attributable to low-level lead toxicity. The more subtle effects that have often been attributed to even lower blood lead levels in recent years are detectable only as a statistical, group phenomenon (for example, as differences in mean intelligence quotient between groups). They are not clinically significant effects that can be identified on an individual basis and attributed to lead exposure. Also, the average I.Q. differences identified in some studies are too small to have any impact on an individual's lifetime achievement, even if one were to assume that the alleged differences are, in fact, real effects attributable to lead exposure. The small differences reported are typically within the intrinsic variability or standard error of the test instruments used. In some of the largest and best studies (for example, the Southampton Study), the apparent differences between groups disappears altogether when other factors known to have a much stronger affect on I.Q. than lead are properly controlled for (Child Neurology 25(Supplement):47, 1983).

As was indicated in the PHA (page 27), the 1986 blood lead screening results were, in fact, intermediate between the results from NHANES II and NHANES III, as one would expect given the nationwide decline in blood lead levels during that period of time. However, more specific conclusions could not be drawn from this comparison, because the data were not matched with the data from West Pullman according to age, sex, race, income level, and geographic location.

There is no strong justification for ATSDR to recommend even more sampling, considering the very large amount of blood lead screening data (for the years 1985, 1986, 1995, and 1996) already available for the larger area around the Dutch Boy/International Harvester site, as well as the low likelihood that the site constitutes a potential source of significant lead exposure now or in the future. More immediately useful would be the release of certain personal identifiers (for example, address, age, sex, race, and household income) associated with individual blood leads already available. The absence of such information severely limits the conclusions that can be drawn from the existing data. Thus, the collection of even more blood lead data that does not lend itself to specific comparisons would serve no useful purpose.

ATSDR thanks the respondent for pointing out that the available data, while indicating no apparent signs of toxicity, nevertheless do not remove the "possibility, however small," that sub-clinical or unmeasurable effects, or both, which might or might not be attributable to lead exposure, might still exist somewhere in the community. However, since it is impossible to prove a negative,

ATSDR has no choice but to concentrate on what the data do or do not indicate.

Comment: 40. Page 26, Paragraph 3
It is inappropriate to compare the blood lead levels for 1986 with the national data for 1976 through1980. In the United States, there has been a consistent decline in blood lead levels from late 1970s up to now. Significant decreases in blood lead levels took place in the majority of the U.S. population, especially in urban populations.

Response: See response to the previous question (#39).

Comment: 41. Page 26, Paragraph 4
The potential for off-site exposure still exists with lead concentrations as high as 16,200 mg/kg. The PHA should call for remediation activities to be conducted in a way that is, truly, protective of human health.

Response: ATSDR has recommended in the health assessment that additional soil sampling be conducted off site to identify areas of potential high lead contamination that may subsequently be remediated to reduce exposure.

Comment: 42. Page 27, Paragraph 1
The PHA should call for remediation activities to be conducted in a way that is, truly, protective of human health.

Response: Please see response to Comment 41(Page 26, Paragraph 4).

Comment: 43. Page 27, Paragraph 2
ATSDR again concludes that "PAHs in soil at the Dutch Boy site did not constitute a probable past hazard to public health because neither the levels nor the exposure conditions were sufficient to produce any known adverse health effects in humans." TOSC requests that ATSDR provide the scientific basis on which to make such an argument (e.g., sampling and analysis from the period of potential historic exposure). To our knowledge, this data does not exist. PAH data taken 15 years after the plant operations ceased cannot be used to assess either the past concentrations or the past exposure. Because of the degradation of PAHs (albeit slow for many) and the irreversible sorption onto soil particles, it is expected that PAH concentrations would have been much higher when the plants were in operation than what were detected at the time of sampling.

The comparison to "eating grilled steak" trivializes the concerns of the community and should be removed from the report. To our knowledge, there is no scientific basis on which to make this comparison.

Response: The referenced conclusion, numerically analyzed environmental monitoring data (for example, "sampling and analysis from the period of potential historic exposure") do not, by themselves, constitute a "scientific basis" for any conclusion regarding the potential health consequences of an exposure. (toxic exposures cannot be identified by just comparing an environmental concentration to some numerical estimate of safety to see which one is larger.) Such conclusions must derive from the knowledgeable interpretation of such data in the light of

"the best medical and scientific information available" (PHAGM, 1992, pg. 7-4). The most relevant information for that purpose relates to (1) the toxicology of the substance in question; (2) its fate in the environment; and (3) the degree of exposure that is feasible through contact with the specific, contaminated medium of concern. In the case of PAHs in on-site soil at Dutch Boy, such relevant information supports the same conclusion regardless of the concentrations involved. For example:

(1) PAHs are, for the most part, readily metabolized and eliminated and, with the exception of some allergic reactions, the acute toxicity of PAHs is relatively low. Few adverse health effects clearly attributable to PAHs have ever been demonstrated in humans.

(2) Inhalation of complex PAH mixtures (for example, cigarette smoke, roofing tar or coal tar pitch volatile, and coke oven emissions) might cause cancer in humans, but the doses required are typically high and of long duration. More to the point, however, there are no studies that provide evidence of a direct association between oral or dermal exposure to PAHs and cancer in humans. Therefore, any attribution of risk to humans exposed via these routes must be based solely on animal experiments.

(3) A few PAHs have caused cancer in laboratory animals treated with extremely high doses by skin-painting or gavage. However, the unusual treatment protocol (including TPA promotion) in the former case and the most commonly affected organ (forestomach) in the latter render such studies of little relevance to cancer risk in humans. People are not repeatedly treated with promoting concentrations of TPA; nor do humans possess an organ analogous to the forestomach of rodents.)

(4) The systemic PAH exposures that result from occupational inhalation exposures are quite simply impossible to achieve with PAHs in soil. Since PAHs bind tightly to soils (as the respondent points out) and exhibit very low volatility, any significant exposure to PAHs in soil would, necessarily, entail direct contact with or ingestion of the soil itself. However, the total doses that might have been associated with such exposure to the most highly contaminated soil at the Dutch Boy site did not approach the levels that might occur in a normal diet.

5) It is not necessarily true, as the respondent suggests, that PAH concentrations in soil "would have been much higher when the plants were in operation." Because PAHs bind tightly to soil particles, they tend to accumulate with time. Also, it is reasonable to expect that, when the plants were in operation, chronic exposure would have been limited to full-time, on-site employees, and the default soil intake rate for adults is only half that of children.

ATSDR also does not concur with the respondents opinion that the grilled steak comparison "trivializes the concerns of the community." The function of this type of comparison is to place estimated data, such as PAH exposures expressed as mg/kg/day, into a meaningful perspective that is readily accessible to all readers. The exposure in this case actually is trivial, from a public health standpoint. But the community's concerns about those exposures most certainly are not. That is why ATSDR takes very seriously the need to put environmental exposures into proper perspective, whether those exposures represent genuine hazards or not. Technical explanations often do more to mystify, than to clarify, scientific matters for the general public; everyday examples, where

applicable, are generally much more effective. However, for the benefit of those readers who might be interested in the mathematical background of the "grilled steak" comparison, some sample calculations are presented below.

Assume, as an intermediate estimate, that an average grilled steak or hamburger patty contains approximately 11 μg benzo(a)pyrene, the most toxic, natural PAH) per kilogram of meat. (Depending on the fat content and the method of cooking, the amount could be as much as ten times higher. See page 92 in Food Safety & Toxicology, DeVries, 1996, or page 439 in Handbook of Human Toxicology, Massaro, 1997.) Each ounce (0.0284 kg) of such a steak would then contain 11 X 0.0284, or 0.3 μg benzo(a)pyrene.

Now, assume that the maximum BaP concentration in soil at the Dutch Boy site (expressed as total BaP TEQs, to introduce even more conservatism into the analysis) is 1.17 mg/kg, and further assume that all of a child's default daily soil intake of 200 μg comes exclusively from this maximally contaminated "hotspot." Even under these unrealistic conditions, a child's daily soil-related BaP intake would still be only 0.0002 X 1.17, or 0.234 ug/day.

Of course, one might argue that a child might not eat one ounce of steak (or hamburger) every day. But then, neither will any child actually eat 200 mg of maximally contaminated soil from the Dutch Boy site every day. Note also that hamburgers from fast food establishments typically contain two to four times the amount of meat used in the preceding example (1 oz). The important point here, however, is not what the absolute concentrations or specific values of default intake rates might be. Rather, if the PAHs in the tens of thousands of hamburgers that Americans eat every day are not associated with any detectable adverse health effects, then even smaller exposures to PAHs in the dirt that they walk on should not be either.

Comment: 44. Page 28, Paragraph 1
ATSDR concludes, "there is no evidence that any of these PAHs individually are carcinogenic to humans, especially by the ingestion route." This statement is irrelevant since the PAHs would not have been ingested as a single compound but as the complex mixture present on the soils or in the dust. Furthermore, there is evidence that chewing tobacco causes a variety of cancers, and any PAHs to which a tobacco-chewer would be exposed, would be ingested. There have been thousands of hours dedicated by toxicologists, health officials and other scientists to set the risk-based criteria for PAHs. Why does ATSDR present a very limited data set (two studies) to try to dispute all of the previous efforts by EPA and others? This entire paragraph should be eliminated.

The reasoning in this paragraph also ignores the fact that the black, oily sludge continuously backs up in residential houses, and the possibility that this sludge contains significant concentrations of PAHs.

Response: ATSDR's choice of data is not designed to "dispute all of the previous efforts by EPA and others." To the contrary, it is designed to supplement the "very limited data set" that regulatory agencies use to assign substances to specific cancer categories. (Generally, the basis of such classifications is one or more animal bioassays conducted at the maximally tolerated dose or, much less often, one or more occupational studies that typically involve dose levels or exposure

routes, or both, that are irrelevant to the conditions of exposure that pertain at the sites being investigated by ATSDR.) These categorical designations simplify the process of regulating substances in the environment that might pose a threat to public health. However, they were never intended to be used to predict actual health effects in people under radically different conditions of exposure from those in the reference studies. The fact that these "risk-based criteria" all too often have been (and continue to be) misused in precisely that way does not in any way justify or validate the discredited practice. (Note that, using standard regulatory methodology, perhaps 40% or more of all chemicals, both man-made and natural, might be categorized as "carcinogens.") ATSDR is required by law (CERCLA, 1980) and by its own published guidance (PHAGM, 1992) to go beyond simplistic cancer classifications and risk-based criteria and comment fully on the likelihood that specific adverse health effects will actually occur, under site-specific conditions of exposure, in people living on or near contaminated sites, and to advise EPA and potentially affected residents accordingly.

Comments: 45. Page 28, Paragraph 2
Again, there have been many hours dedicated by toxicologists, health officials and other scientists to set the risk-based criteria for asbestos. ATSDR presents a very limited data set ("several epidemiological studies" presented in a secondary reference) to dispute all the previous efforts by EPA and others. This entire paragraph should be rewritten to reflect the scientific evidence that the maximum level of asbestos measured in air in 1996 exceeded ATSDR's CREG for asbestos, but that the health effects due to this exposure cannot be determined, since the length of exposure is unknown.

Response: The "health effects due to this exposure" could not have been determined even had the length of exposure been known. Again, the respondent appears to be confusing regulatory standards and user-friendly risk management tools with the medical and toxicological data that are actually relevant to the realistic, site-specific assessment of potential health effects in chemically exposed human beings. (See the response to the previous comment, # 44).

Comment: 46. Page 28, Paragraph 3
The paragraph should end with the third sentence ("...did or did not exceed the GREG"). There is insufficient scientific evidence to make the additional conclusions made in this paragraph. In particular, because the detection limit was so high, ATSDR does not know whether hazardous exposures occurred. In addition, ATSDR ignores past arsenic exposures, which may have occurred during the 1983-1986 demolition work.

Response: If ATSDR were to edit the indicated paragraph in the way that the respondent recommends, the agency would be eliminating the only useful information available on which to base an assessment of the probable health implications of the exposures of concern.. The resulting truncated paragraph would convey no useful information at all, and the resulting information vacuum would only invite unfounded and needlessly alarming speculation which would not serve the best interests of the affected community. In support of its conclusions, ATSDR is frequently unable to provide solid evidence that proves satisfactory to all interested parties. However, it is always possible, at the very least, to use any and all available and relevant information to put the exposures of concern into some kind of meaningful perspective.

Because ATSDR could not comment on the unknown concentration of an undetected substance, the next best thing was to consider the possibility that concentrations only slightly below the detection limit would produce adverse health effect in exposed humans. While the CREG for arsenic in air (0.0002 $\mu g/m^3$) was 700 times lower than the detection limit of 0.14 $\mu g/m^3$, the detection limit itself was 70 times lower than the lowest cancer effect level ever reported in humans (10 $\mu g/m^3$), and there was no way of knowing how much lower still the true concentration of arsenic in air at Dutch Boy might have been. Thus, even under worst case conditions, for example, assuming that the true concentration of arsenic in air was the highest it could be without being detected and that people were chronically exposed to this highest concentration throughout their entire lifetimes, no detectable adverse health effects would be expected. Under more realistic conditions of exposure, any theoretical health risks would have been proportionately lower, if indeed they existed at all.

Comment: 47. Page 28, Paragraph 4
How does ATSDR know the frequency of trespassing ("occasional")? Could it not be possible that residents from the West Pullman and Victory Heights neighborhoods cross through the site twice each day, five days per week, on their way to and from the Metroline stop?

Response: Yes, it most certainly is "possible." But it would, in ATSDR's opinion, still constitute "occasional" trespassing, which is to say, an activity pattern that would occasion only intermittent (nonchronic) exposures of little or no toxicologic significance.

Comment: 48. Page 29, Paragraph 1
In a discussion of hazards associated with PAHs, ATSDR states, "The maximum concentrations of PAHs in on-site soils at IH were actually higher than the maximum concentrations detected in 'black, oily-sludge' from the bottom of on-site manholes, suggesting that these heavily contaminated 'soil' samples would probably not qualify as the type of soil that might be incidentally (and especially not intentionally) ingested by workers or trespassers." ATSDR appears to be stating that, because the concentration of soil PAHs were higher than in the sludge, people will not tend to ingest the soil. As written, this statement appears to be an attempt to justify an unsubstantiated conclusion that the soil PAHs do not present a health hazard. This paragraph should be rewritten.

Response: ATSDR considers that the meaning of the paragraph is clear as written. It expresses the entirely reasonable expectation that adults and children alike are far more likely to avoid foul-looking, sludge-like material than they are to habitually ingest it.

Comment: 49. Page 29, Paragraph 2
ATSDR again concludes, "...PAHs in soil at the IH site are not likely to have caused adverse health effects in workers." TOSC requests that ATSDR provide the scientific basis on which to make such an argument (e.g., sampling and analysis from the period of potential historic exposure). To our knowledge, those data do not exist. PAH data taken 15 years after the plant operations ceased cannot be used to assess either the past concentrations or past exposure. Because of the degradation of PAHs (albeit slow for many) and the irreversible sorption onto soil particles, it is expected that PAH concentrations would have been much higher when the plants were in operation than what were detected at the time of sampling.

Response: See the response to Comment 43.

Comment: 50. Page 29, Paragraph 3
The risk assessors write that there was "limited potential for exposure (i.e., ingestion of on-site soil)." As we have stated previously, ATSDR should recognize the potential for children playing on the site, digging in soils and then putting their fingers in their mouths, riding bikes, and breathing contaminated dust. Does ATSDR have data to suggest that the presence of "asbestos in the soil at this site is not likely to pose a public health hazard?"

Response: See responses to Comments 36, 45, and 50.

Comment: 51. Page 29, Paragraph 4
What is the relevance of blood lead screening on 10 children by the city of Chicago? Were these children from this community? Where are their homes located? Do they attend Edward White Elementary School? Do they play on the site? More information is needed in order to make any sense of those data.

Response: The "relevance of blood lead screening on 10 children by the city of Chicago" is that those 10 constitute all of the children from the West Pullman neighborhood who received the blood lead screening offered by the city health department to area children in 1996. Unfortunately, the law required that all personal identifiers be removed from the data provided to ATSDR. The absence of such identifiers severely limited the conclusions that might have been drawn from the data. However, while the data did not allow for sweeping conclusions about either the neighborhood population as.a whole, or specific individuals, they also did not indicate any pervasive public health problems related to off-site lead exposure.

Comment: 52. Page 30, Paragraph 1
ATSDR states that "none of the chemicals of concern identified at the Dutch Boy and International Harvester sites are known to have caused any of the above-indicated human health effects." However, this does not negate the possibility that health problems occurred, but were not identified. It is known that nine cases of lead toxicity occurred. Is it not plausible that other, more subtle, health problems occurred, but were not identified?

If the sludge that creeps into homes is similar in chemical composition to that in the on-site manholes, then there is sufficient cause for concern. ATSDR should address the possibility that the "in-home" sludge contains PAHs.

Response: ATSDR endeavors to focus on what existing data do or do not indicate, when interpreted in the context of the best available medical and toxicological information, and to offer judgements based on what is known or is likely to be true, rather than on what is merely "possible."

As for the "sludge" question, ATSDR did "address the possibility that the in-home sludge contains PAHs," and it did so in the very same passage cited in the comment. Quoting Page 30, Paragraph 1, sentences 2 and 3: "The sludge in manholes was reported to be similar to sludge found in some basements. This on-site sludge was analyzed and did contain some PAHs, metals, and VOC

contaminants, but not at levels likely to result in adverse health effects."

Comment: 53. Page 30, Paragraph 2
ATSDR correctly states that "sustained dermal contact with complex mixtures of PAHs (e.g., coal tar) can cause skin irritation." Children are known to have played on the IH site. Photographs have been taken of the children surrounded by a cloud of dust. Is it possible that those children sustained dermal contact if they were playing regularly on the site? In addition, allergic skin rashes are not necessarily caused by dermal exposure alone; all possible routes of exposure, including inhalation and oral exposures, can result in systemic allergic responses, including skin rashes.

Response: Yes, it is possible that children playing on-site "sustained dermal contact," but such contact would not likely have resulted in any adverse health effects. If merely incidental contact does results in a skin rash, then an allergic condition is clearly indicated. Health-based comparison values are not applicable to allergic conditions, because allergic reactions are neither dose dependent nor predictable. The only way for allergic individuals to protect themselves is to avoid contact with the allergen or to take treatments to become desensitized.

Comment: 54. Page 30, Paragraph 3
There is a consensus among toxicologists that elevated lead levels may be associated with aggressive behavior. The statement that any "amount of aggressive behavior is normal" is suspect. ATSDR presents no evidence for the assertion that aggression among children in this neighborhood is the result of child abuse, low self-esteem, drugs, alcohol or mental illness. Community members viewed this statement as insulting and insensitive. We challenge ATSDR to tell a citizen in a public meeting that his/her concern about his/her child's aggressive behavior may be linked, not to lead exposure, but instead to mental illness or child abuse! This paragraph must be eliminated.

Response:
The statement ATSDR made regarding aggressive behavior was not intended to be insensitive and the document has been modified. The statement on page 30, paragraph 3, was presented to point out that other risk factors are more effectual, than lead exposure, in influencing aggressive behavior. These risk factors are widely recognized, by scientists and laymen alike, as being among the most important causes of excessively aggressive behavior.

Comment: 55. Page 30, Paragraph 5
Terms like sarcoidosis and granulomatous should be defined.

Response: The reference to sarcoidosis was made in response to a specific community health concern which used the same term. Sarcoidosis is a chronic disease, the cause of this disease is unknown. It is characterized by the formation of nodules in the skin, lymph nodes, lungs, and bones.

Comment: 56. Page 30-32, Child Health Initiative
We commend ATSDR for this entire section as it portrays a much more accurate picture of the risks associated with the DB and IH sites. The author of this section should be commissioned to

edit/rewrite the rest of the document. However, we have several suggestions to improve this section.

Response: ATSDR thanks you for the comment, however it should be noted that this section was written by the same person. We welcome your suggestions.

Comment: 57. Page 31, Paragraph 2, Line 5
"Metals" should be added to the list of contaminants to which children playing on the IH site may have been exposed.

Response: The word "metals" has been added to the last sentence in paragraph 2 on page 31.

Comment: 58. Page 31, Paragraph 4 (Current Exposure, DB)
The presence of lead in off-site (roadway) soils needs to be mentioned.

Response: It is mentioned in sentence 4 of paragraph 4 on page 31.

Comment: 59. Page 32, Paragraph 2
Children may be exposed to any chemicals in the black oily sludge until that material is removed.

Response: The sentence, "ATSDR recommends that persons who are concerned with black oily sludge in their basement periodically when it rains, should have it tested for contaminants," has been added to paragraph 1, page 32. However, the presence of the sludge might only occur when there is so much rainfall in a short period of time that the sewer may backup.

Comment: 60. Page 32, Conclusions
ATSDR should state that present levels of lead in the air surrounding the fences, on-site and off-site are unknown and need to be addressed through additional characterization.

Response: This information is stated on Page 32, Conclusions, Bullet Item 3, #1.

Comment: 61. Page 32, Bullet Item 1, #1
There is no evidence to suggest that significantly elevated blood lead levels were limited to those individuals exposed while on-site.

Response: Please refer to ATSDR's response to Comment 26 (Page 17, Paragraph 2) and response to Comment 38 (Page 26, Paragraph 1).

Comment: 62. Page 32, Bullet Item 1, #2
There is no data to support the conclusion that the concentrations of PCBs, asbestos, and PAHs were not sufficiently high as to cause any adverse health effects because of the uncertainty over historic levels of contamination and historic exposures.

Response: Please refer to ATSDR's response to Comment 2 (Page 4, Paragraph 3. Sentence #2) and response to Comment 43 (Page 27, Paragraph 2).

Comment: 63. Page 32, Bulleted Item 2, #2
The lack of vegetation during the winter months creates the potential for contaminated dust to be blown from the site into residential areas. Additionally, the lack of vegetation during the winter months creates the potential for contaminated dust to be blown from the site into residential areas.

Response: Exposure to soil blown off the site in the winter months would be reduced because the ground in the winter months is often wet, frozen, or covered with snow and when people are less likely to be outside as often.

Comment: 64. Page 32, Bulleted Item 2, #3
Proper air monitoring will not reduce exposure, proper safety precautions will.

Response: ATSDR stated that, "additional remedial activities will further reduce potential exposure." Air monitoring is proposed as a safety precaution to monitor for potential on and off-site exposures during remedial activities.

Comment: 65. Page 33, Bullet Item 1
On what basis is the statement made that "past exposures to these on-site contaminants are not likely to have caused any health effects?" The problem is that those data do not exist. Additionally, the lack of air quality data needs to be addressed.

Response: Please refer to ATSDR's response to comment 19, page 10, paragraph 3 regarding the air data. ATSDR made this statement based on the types and concentration of contaminants identified from the data reviewed, the method of exposure, the length of exposure, a toxicological evaluation on the amount of contaminant that is likely to be taken into the body, and the expected health effects known from previous studies. Also refer to responses to Comments 36 (Page 25, Paragraph 4) and 49 (Page 29, Paragraph 2).

Comment: 66. Page 33, Bullet Item 4
On what basis is the statement made that "off-site exposures to site related contaminants do not appear to have been associated with any identifiable public health hazard in the past?" While the effects may not have been identified, the hazards clearly have been documented. There is no basis on which to make the statement that there is not "any health hazard likely to exist now or in the future." In fact the data suggest otherwise.

Response: Please refer to response to Comment 38.

Comment: 67. Page 34, Item 2
Details on the topics to be presented during any community education efforts are warranted.

Response: ATSDR has expanded the recommendations on health education to include information on the potential hazards of going onto either the Dutch Boy or International Harvester sites and education on potential sources of contaminants identified on and off the sites.
Please refer to Page 33, recommendation 2 for Dutch Boy and recommendation 4 in the health assessment.

Comment: 68. Page 35, Item 1
Maintaining the fence around the site should be mentioned.

Response: ATSDR has made this recommendation throughout the document and has also sent a letter to the EPA and ILDEP regarding this issue. Please refer to Appendix B in the health assessment.

Additional Recommendations to ATSDR

There is an urgent need to determine the concentrations of lead in the air around the fences, in the residential and school areas, and on the site. The concentration of lead in the dust in the classrooms of the Edward White Elementary School and in area houses should also be determined as soon as possible. Air samples should also be obtained for other contaminants, including PAHs, asbestos and various volatile organic chemicals that might be present in the GRO- and DRO contaminated soils. Air samples should be taken in houses when black oily sludge backs up in the sewer, especially since one advisory council member stated that his house reeks of a petroleum-like odor for several days after the sludge backs up in his basement.

Response: ATSDR has made recommendations to conduct perimeter air monitoring for lead, polycyclic aromatic hydrocarbons, volatile organic compounds, and asbestos during future remediation of the Dutch Boy site. Perimeter air monitoring will detect contaminants at the perimeter of the site to determine if there are potential off-site releases occurring during remedial activities.

1. The infiltration of the black oily sludge in residential houses should be stopped.

Response: ATSDR has recommended that people who are concerned with black oily sludge in their basements periodically when it rains, should have it tested for contaminants.

2. An effective community-wide program to test children's blood lead and to examine the relationship between aggressive behavior and other possible causative factors ATSDR has suggested on page 30, needs to be implemented.

Response: According to local health department reports, several meetings to discuss screening residents in the area for lead already have occurred. Public Meetings were held on May 17 and June 7, 1986, prior to and after a court order was issued on May 19, 1986, to stop demolition activities at the sites. The Chicago Department of Health and the Cook County Health Department provided screening services with support and consultation from the Illinois Department of Public Health. The screening effort extended to all adults and children residing in the area and all adults who had been employed by the factory. It was anticipated that 3,000 people would be screened by this effort. On June 10 and 11, 1986, the Chicago Department of Health and the Cook County Health Department provided screening services at two locations, screening over 2,500 residents living nearby.

3. Currently children and other residents having free access to the lead-contaminated soils along the railroad could be exposed to undesirable amounts of lead. The lead-contaminated dust and

soils can be carried to their homes. This area should be identified as hazardous, public access to the area should be stopped, and a public health advisory warning should be issued.

Response: ATSDR will discuss the option of placing signs along the fence line to warn people of potential hazards.

4. A plan to determine the body burdens of lead in women of reproductive age and in children needs to be developed as soon as possible.

Response: Please refer to responses to comments 38 (Page 26, Paragraph 1) and 39 (Page 26, Paragraph 2).

5. Additional analysis for PCBs on the IH site is warranted to determine the fate of the PCBs that were found in 1987, but not in 1995.

Response: Sampling in 1987 detected PCBs at a concentration of 18 ppm in soil samples taken on the IH site. PCBs were not detected above the minimum detection limit during further soil sampling conducted in 1995. The site is currently covered with vegetation, and with proper maintenance of the fence, exposures should be minimal. Also, additional remedial activities are planned by the EPA to further reduce the potential for future exposure.

6. Residents that have black oily sludge in their basements should be examined for health effects potentially related to the chemicals that may be found in the sludge.

Response: During ATSDR's availability session, residents expressed concern about the sludge in their basements that occurred during periods of rain. The sludge in manholes located on the International Harvester site was reported to be similar to the sludge found in residential basements. Samples were taken in the manholes and analyzed for PAHs, PCBs, and metals (IEPA, March 1995). Refer to Appendix C, Table C, for a list of the contaminants detected. ATSDR reviewed the data and the levels of PAHs and metals were above ATSDR child comparison values, but below levels of health concern. VOCs were below comparison values. Please refer to the response to Comment 48 (regarding Page 29, Paragraph 1, in the health assessment).

Comment: 69. ATSDR did not address the age of housing in the neighborhood surrounding the site, and the likely impact of lead-based paint on health. Studies have clearly shown that leaded dust in older homes is a major contributor to elevated blood lead in children compare to lead in outdoor soil.

Response: ATSDR stated in the public health assessment that off-site soil data were limited. While surface soil sampling conducted in March 1995 did not demonstrate concentrations of lead at levels of health concern, a small number of samples were taken to evaluate exposures to off-site contaminants. Therefore, ATSDR made a recommendation in the health assessment to further sample residential soils within the community. When these data become available, the potential off-site exposure pathways, including non-site-related potential exposures will be further evaluated.

Comment: 70. On page 5, there is mentioned that demolition at the Dutch Boy site resulted in the lead poisoning of 5 people. IEPA considered the activities to be an "imminent danger: due to lead and asbestos airborne exposure. On page 7, the elevated blood lead levels are "attributed to the demolition activities at the Dutch Boy site." This should be mentioned as a past completed exposure pathway in the toxicological evaluation.

Response. ATSDR has included this information in the completed exposure pathway section of the document in the text (page 17), in Table 6 (page 17), and in the toxicological evaluation section on page 26. ATSDR requested but was not provided the information to review the blood lead data regarding exposures that occurred on the Dutch Boy site and relied on references made in other documents.

Comment: 71. In Tables 1 and 3, shouldn't the comparison value (if the term is used correctly here) be 400 ppm (USEPA, June 1998) rather than 500 ppm.

Response:. The EPA recommended action level for lead in residential soils is 400 ppm. Tables 1 and 3 have been amended and corresponding changes have been made within the text.

Comment: 72. In the conclusions, both "potential" and "indeterminate" public health hazards are no longer acceptable. The authors should make conclusions from the data that is available, and then recommend the additional data needed to better characterize the site.

Response: Currently, ATSDR is using five hazard categories for ranking sites, including "indeterminate public health hazard." Revised categories are being proposed but have not been formally adopted. Therefore, the existing categories were used within the document. In addition, "potential" was never a health hazard category, but is used to define a pathway of exposure. When ATSDR's revised categories are available they will be provided upon request.

Comment: 73. In the recommendations, what is meant by "provide community education?" Education about what? What is the purpose of the education? Michigan State University has already provided considerable education in the community, but this is not mentioned.

Response: ATSDR has modified the recommendation section of the document to read, "provide community education regarding potential exposures when trespassing on the site." This pertains to both sites, but in particular to the International Harvester site where fence security remains a concern. Also, see page 34, of the public health action plan section. ATSDR has recognized the completed community health activities provided by the Technical Outreach Services (TOSC) for the community living near the International Harvester and the Dutch Boy sites. TOSC is a service provided by Michigan State University.

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