Health Consultation

ADEPT TOOL AND MACHINE COMPANY, SITE 121
EAST ST. LOUIS, ST. CLAIR COUNTY, ILLINOIS

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

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In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation 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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HEALTH CONSULTATION

ADEPT TOOL AND MACHINE COMPANY, SITE 121
EAST ST. LOUIS, ST. CLAIR COUNTY, ILLINOIS

Prepared By:

Illinois Department of Public Health
Under cooperative agreement with the
Agency for Toxic Substances and Disease Registry

Purpose

The Illinois Department of Public Health (IDPH) and the Illinois Environmental Protection Agency (Illinois EPA) have collected data for inorganic chemicals in soils near the Adept Tool and Machine Company site as part of an area wide investigation of lead in East St. Louis. IDPH has reviewed the available data concerning the Adept Tool site. The purpose of the data review was to determine whether adverse health effects would be associated with exposure to the levels of chemicals detected in these samples. Data reviewed included samples from air monitoring sites and soil.

Background and Statement of Issues

Site History

The Adept Tool and Machine Company is at 1315 18th Street in East St. Louis, Illinois in St. Clair County (Figure 1). Adept Tool and Machine Company began operation before 1958, and it is not known when operations ceased (1). The processes and products made at this location are not known. The site is surrounded by residences on the south and east, East St. Louis Housing Authority apartments to the north, and a maintenance yard for East St. Louis public schools and an abandoned elementary school to the northeast. A city park also is about 300 feet to the northeast. The site is about 1,000 feet from the Pfizer Pigments site. IDPH has written a public health assessment (March 2001) and a health consultation (December 2003) for the Pfizer site.

In August 1999 and again in May 2000, IDPH collected residential surface soil samples near Adept Tool Company. This sampling was conducted as part of the Mississippi Gateway Initiative study (2). In May 2002, the site and surrounding residential areas were screened using an x-ray fluorescence (XRF) device by an Illinois EPA contractor as part of the Metroeast Lead Collaborative Initiative. At the request of Illinois EPA, IDPH reviewed the soil sample results and sent letters that gave a health-based interpretation of the results to 10 residents.

In December 2002, the Adept Tool and Machine Company site and nearby properties were remediated by an Illinois EPA contractor. The lead cleanup level of 400 parts per million (ppm) was based on the Residential Cleanup Objective established under the Tiered Approach to Corrective Action Objectives (TACO) (3). A total of 609.6 tons of soil were removed from six properties. After cleanup, each property was cleared by using an XRF. In addition, 10 laboratory samples were collected to confirm the XRF readings.

Sampling Activities

In August 1999, IDPH collected four residential soil samples near Adept Tool Company as part of the Mississippi Gateway Initiative (Figure 2). IDPH collected an additional 11 surface soil samples from nearby yards in May 2000. These fifteen samples were analyzed for lead only. Eight samples collected in conjunction with the Pfizer site were within 1,000 feet of Adept Tool and are included in this health consultation. The Pfizer samples were analyzed for arsenic, barium, cadmium, iron, and lead. Soil sample results are shown in Table 1.

In May 2002, an Illinois EPA contractor screened 171 locations using an XRF instrument. Only the lead concentration was reported. They tested the Adept Tool site and the nine surrounding properties using a 10 foot by 20 foot grid pattern (3).

Air monitoring was conducted by Illinois EPA and IDPH staff at two sites using high volume air samplers. These monitors were part of an assessment of the airborne contamination from the Pfizer Pigment site. The locations of these monitors were approximately ½ mile to the northeast and southeast of the Adept Tool site. Air samples were collected every six days from October to December 2001. A total of 15 samples were collected at each site. The samples were analyzed for total suspended particulates (TSP), arsenic, barium, beryllium, cadmium, chromium, iron, lead, manganese, nickel, selenium, vanadium, nitrates, and sulfate (Table 2).

Discussion

Chemicals of Interest

IDPH compared the results of each environmental sample with the appropriate screening comparison value used to select chemicals for further evaluation for carcinogenic and non-carcinogenic health effects (Attachment 1). Chemicals found at levels greater than comparison values or those for which no comparison values exist were selected for further evaluation. The chemicals of interest in soil near the Adept Tool and Machine Company site are lead and arsenic.

No additional chemicals of interest were found in the air. IDPH recognizes that the number of air samples collected near the site is limited. The levels of dust in the neighborhoods were measured by TSP, which is a measure of total dust, and not just the respirable portion. TSP concentrations did not exceed either the old TSP standards or the current PM-10 (particulate matter with a diameter less than or equal to 10 microns) standards.

Exposure Analysis

Exposure to a chemical at a level that exceeds a comparison value does not necessarily mean that adverse health effects will result. The potential for exposed persons to experience adverse health effects depends on –

- how much of each chemical a person is exposed to,
- how long a person is exposed, and
- the health condition of the exposed person.

An exposure pathway consists of a source of contamination, environmental media and transport mechanisms, a point of exposure, and a receptor population. Exposure to a contaminant may have occurred in the past, may be occurring now, or may occur in the future. When all these elements linking the contaminant source to an exposed population are known, a completed exposure pathway

exists. When one of these elements is missing, but may occur, a potential exposure pathway exists. If a part of a pathway is absent and will never exist, the pathway is incomplete and can be eliminated from further consideration.

Soil Exposure

The surface soil has been removed in areas where soil lead levels exceeded 400 ppm. Therefore, exposure to lead in soil from the site has been greatly reduced and is no longer a hazard.

Elevated levels of arsenic were found in the soil samples collected within 1,000 feet of Adept Tool. The maximum level of arsenic was 33 ppm (Table 1). To estimate exposure we assumed that a 40 kg person would ingest 100 mg of soil daily for 18 years. This would result in no apparent increased risk of cancer. No noncancer health effects would be expected from exposure to arsenic in soil.

Air Exposure

Air exposure was previously estimated for the samples collected October through December 2001. The analysis of these samples including exposure assumptions are listed below (Table 2).

To estimate exposure, IDPH assumed that children would be exposed to the chemicals of interest at the highest maximum quarterly concentration at either site, and that they were exposed for 24 hours a day, 7 days a week, 52 weeks per year. IDPH also assumed that contaminant levels in total suspended dust were the same as the respirable portion of the dust.

The estimated exposure doses were compared with health guidelines for non-cancer health effects. Cancer risks were estimated for arsenic. From these scenarios, IDPH found no non-cancer health hazards and no apparent increased cancer risk due to exposure to airborne contamination.

Child Health Considerations

IDPH recognizes that children are especially sensitive to some chemicals. For this reason, IDPH included children when evaluating exposures at this site. Children are the most sensitive population considered in this health consultation; however, children are not currently being exposed to chemicals from the site at sufficient levels to cause adverse health effects.

Community Health Concerns

No one has voiced concerns about this site specifically, since it was an abandoned site and next to a much larger manufacturing facility, Pfizer Pigments. Community health concerns regarding the Pfizer site are listed in the Community Health Concerns section of the Public Health Assessment for Pfizer Incorporated.

Conclusions

Based on the information reviewed, IDPH concludes that the Adept Tool Site does not pose a public health hazard. Arsenic and lead were the chemicals of interest at the site. Contaminated soil in residential yards near the site has been removed and replaced with clean soil, eliminating any future hazard. Arsenic in the soil near Adept Tool poses no apparent increased risk of cancer to residents.

Recommendations and Public Health Action Plan

IDPH has no recommendations at this time.

Preparer of Report

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References

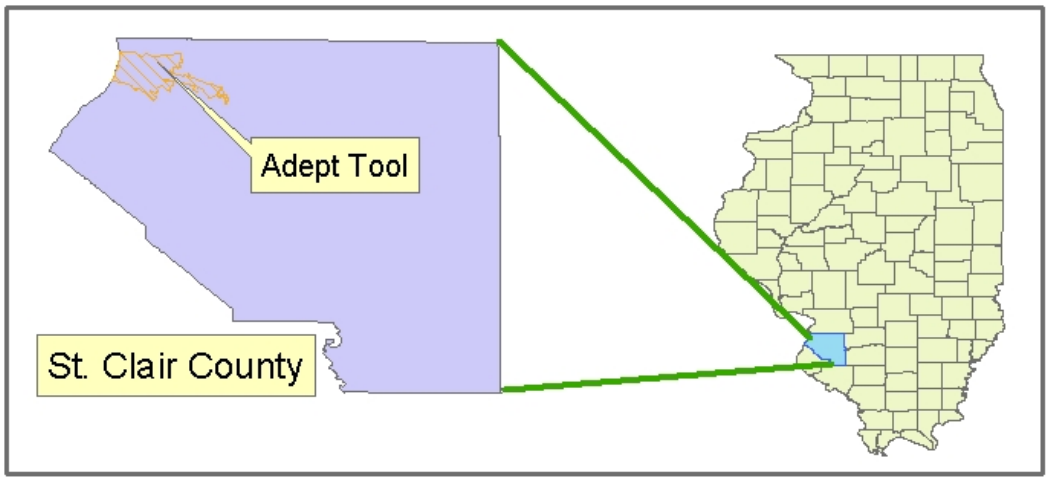
1. USEPA. Historical Analysis of Lead Facilities in the Gateway Initiative Area from 1890 to the present, Compact Disc, 1998.

2. IDPH, Preliminary Assessment of Uncontrolled Lead Releases in the Mississippi River Gateway Initiative Area, September 27, 2002.

3. Bodine Environmental Services. Lead Contamination Removal Action Completion Report, Adept Tool, Site 121, East St. Louis, Illinois, LPC #1630455242. July 2003.

4. Agency for Toxic Substances and Disease Registry. Toxicological profile for manganese. Atlanta: US Department of Health and Human Services; July 1999.

Figure 1 - Site Location Map



IDPH, 2005

Figure 2 - Adept Tool Sample Location Map

TABLES

GU comment

Table 1. Surface Soil Samples near Adept Tool in PPM					
Sample #	Lead	Arsenic	Barium	Cadmium	Iron
150	652	22.9	1,290	5.1	47,810
151	588	19.1	730	4.1	42,170
155	861	15.5	885	4.3	26,910
156	471	8.9	2,140	5.6	26,680
157	518	14.3	1,600	3.5	25,590
158	275	27.9	1,045	2.8	17,050
159	283	33.3	678	2.1	17,130
168	671	12	1,754	4.9	31,670
12101	285	NA	NA	NA	NA
12102	222	NA	NA	NA	NA
12112	352	NA	NA	NA	NA
12104	1,954	NA	NA	NA	NA
12105	91	NA	NA	NA	NA
12106	434	NA	NA	NA	NA
12107	1,787	NA	NA	NA	NA
12108	1,113	NA	NA	NA	NA
12109	125	NA	NA	NA	NA
12110	65	NA	NA	NA	NA
12111	375	NA	NA	NA	NA
122	422	NA	NA	NA	NA
121	261	NA	NA	NA	NA
123	1,209	NA	NA	NA	NA
124	296	NA	NA	NA	NA
Max	1,954	33	2,140	6	47810
Comparison Value	400	20	4,000	10	NA
Source of Comparison Value	USEPA	EMEG	EMEG	EMEG	NA

PPM = parts per million
EMEG = Environmental Media Evaluation Guide
NA = not applicable

Table 2 – Air Samples Near Pfizer, Inc				
Compound	Detection Limit in µg/m3	Maximum Concentration in µg/m3	Comparison Values in µg/m3	
			Noncancer (Source)	Cancer (CREG)
Arsenic	-	0.03	NV	0.0002
Barium	-	0.639	NV	NV
Beryllium	0.003	0.003	0.02 (RfC)	0.0004
Cadmium	0.003	0.006	NV	0.0006
Chromium	0.005	0.005	0.1/1 (RfC/IEMEG)	8E-05
Iron	-	1.637	NV	NV
Lead	-	0.354	NV	NV
Manganese	-	0.062	0.04 (C EMEG)	NV
Nickel	0.01	0.01	0.2 (IEMEG)	NV
Selenium	0.001	0.002	NV	NV
Vanadium	0.003	0.006	0.2 (A EMEG)	NV
TSP	-	108.4	NV	NV
Nitrate	-	8.084	NV	NV
Sulfate	-	16.087	NV	NV

CREG – Cancer Risk Evaluation Guide
NV – No Value Available
RfC – Reference Concentration
IEMEG – Intermediate Environmental Media Evaluation Guide
CEMEG – Chronic Environmental Media Evaluation Guide
AEMEG – Acute Environmental Media Evaluation Guide

Attachment 1

Comparison Values Used In Screening Contaminants For Further Evaluation

Environmental media evaluation guides (EMEGs) are developed for chemicals on the basis of their toxicity, frequency of occurrence at National Priorities List (NPL) sites, and potential for human exposure. They are derived to protect the most sensitive populations and are not action levels, but rather comparison values. They do not consider carcinogenic effects, chemical interactions, multiple route exposure, or other media-specific routes of exposure, and are very conservative concentration values designed to protect sensitive members of the population.

Reference dose media evaluation guides (RMEGs) are another type of comparison value derived to protect the most sensitive populations. They do not consider carcinogenic effects, chemical interactions, multiple route exposure, or other media-specific routes of exposure, and are very conservative concentration values designed to protect sensitive members of the population.

Cancer risk evaluation guides (CREGs) are estimated contaminant concentrations that are based on a probability of 1 excess cancer in 1 million persons exposed to a chemical over a lifetime. These are also very conservative values designed to protect sensitive members of the population.

Maximum contaminant levels (MCLs) have been established by USEPA for public water supplies to reduce the chances of adverse health effects from contaminated drinking water. These standards are well below levels for which health effects have been observed and take into account the financial feasibility of achieving specific contaminant levels. These are enforceable limits that public water supplies must meet.

Lifetime health advisories for drinking water (LTHAs) have been established by USEPA for drinking water and are the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects over a lifetime of exposure. These are conservative values that incorporate a margin of safety.

Certification

This Adept Tool & Machine Company public health consultation was prepared by the Illinois Department of Public Health under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). It was completed in accordance with approved methodologies and procedures existing at the time the health consultation was initiated. Editorial review was completed by the Cooperative Agreement partner.

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The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation and concurs with its findings.

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