

Health Consultation

MORRIS PAINT & VARNISH
EAST ST. LOUIS, ST. CLAIR COUNTY, ILLINOIS

EPA FACILITY ID: ILD096721063

**Prepared by the
Illinois Department of Public Health**

AUGUST 20, 2009

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

A health consultation is a verbal or written response from ATSDR or ATSDR's Cooperative Agreement Partners to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

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 or ATSDR's Cooperative Agreement Partner which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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Purpose

The Illinois Environmental Protection Agency (Illinois EPA) conducted an investigation of the Morris Paint and Varnish (Morris Paint) site under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Illinois EPA asked that the Illinois Department of Public Health (IDPH) review the environmental data associated with the site to determine if a public health hazard exists. Illinois EPA collected soil and groundwater samples as part of their assessment of the site.

Background and Statement of Issues

Site Description and History

The Morris Paint site is rectangular in shape and occupies approximately 3.5 acres at 1445 Brady Avenue, East St. Louis, St. Clair County, Illinois (Figure 1). The site is bordered by railroad tracks to the northeast, Brady Avenue to the southwest, 14th Street to the northwest and 15th Street to the southeast (Figure 2). Before December 1979, the site was known as Morris Industries, Inc. Both companies were involved with paint manufacture.

The site was originally inspected by Illinois EPA on November 17, 1987. At that time, the site had nine underground storage tanks with individual capacities between 2,000 and 6,000 gallons. There were five 1,000 gallon resin tanks with the resins being used in the manufacture of paint (2). In addition, there were two 1,000 gallon mixing tanks that emptied into a 2,500 gallon holding tank that was used to fill 1 and 5 gallon containers (2). At the time of the inspection, open drums and paint residue from drum washing were evident. Damaged but intact drums were seen during the initial visit and discharge from some drums onto the ground surface was seen in a subsequent inspection on November 20, 1987.

In May 1988, after the drums had been sampled, analyzed and segregated into compatibility groups, some were disposed off the site. A total of 1,949 drums were disposed. Most drums contained paint solvents and only drums outside of the buildings were removed at this time. Contaminated soil was not removed at this time.

On February 9, 1990, two leaking transformers were discovered on the ground. An estimated 50 gallons of oil was released of which approximately 40 gallons was captured using absorbent materials. Clearance samples were collected by Union Electric and Illinois EPA.

The site has had several fires and been the subject of two removal actions. In March 1982, fire destroyed much of the plant. On March 5 and 9, 1990, more fires occurred. The March 9 fire destroyed a building containing rubbish and paint (3).

On March 13, 1990, the U.S. Environmental Protection Agency (USEPA) conducted an emergency site assessment in response to the fires. USEPA concluded that the conditions at the Morris Paint site posed a threat to human health and the environment and warranted a removal action (4). The conditions on the site that lead USEPA to this conclusion included the threat of fire or explosion of tanks; drums, and cans of flammable liquids; and potential exposure to hazardous substances, pollutants, or contaminants by nearby populations (4).

A temporary injunction to close the property was granted on January 3, 1990, and the site was permanently closed on July 26, 1990 (5).

Removal of the remaining drums began on March 16, 1990 and was completed on June 6, 1990 by USEPA and their contractors. This removal action included repairing the fence around the site, dismantling the burned warehouse building, removal of nine underground storage tanks, and removal of contaminated soil and waste on the soil surface (4).

In September 2001, USEPA requested that Illinois EPA conduct a CERCLA Combined Assessment of the site (6). The combined assessment was conducted to fill gaps in data that existed at the site. Sampling for the Combined Assessment was completed in March 2002 and a Report was issued on September 10, 2002 (6).

Site Visits and Demographic Information

On April 29, 2008, IDPH staff conducted a site visit along the perimeter of the property. At this time three workers were observed on the site. The fence was mostly intact, but there were some holes in the fence. The gate was open at the time as workers were on the site.

IDPH staff revisited the site on August 28, 2008. The gate was secured with a chain and padlock and posted "No Trespassing". There was a gap in the chain link portion of the gate where a person could squeeze through. No workers were observed on the site, but a large back hoe and a tractor trailer truck were observed on the property. Much of the perimeter fence is within dense brush. Working through the brush along Brady Avenue, IDPH staff observed a hole in the fence, but no evidence of trespass. In one location along 15th Street, the perimeter fence is leaning outward.

The two closest residential areas near the site are private homes within 150 feet northeast of the site and a public housing area within 500 feet southwest of the site (Figure 2). Two schools, a middle school and an elementary school, are within 0.3 miles of the site. The Mississippi River is approximately 1.5 miles west of the site.

Based on 2000 census data, the estimated population within 0.25 miles of the site is 2,485. The population within 0.5 miles is 5,171, and within 1 mile is 11,109 (1).

Past Sampling Activities

On January 20, 1988, a sampling inspection at the facility was conducted at the site. At this time there were approximately 2,200 55-gallon drums on the site, most of which were being stored outside. The drums contained paints, solvents, resins, and tar-like substances (5). Seven samples of wastes surface were collected during this inspection either directly from the drums, the concrete pad, or ground (2). Results of some of these samples detected the presence of toluene, ethylbenzene, and xylene. As a result of these samples, a cleanup of the site was initiated. The cleanup started on April 25, 1988 and began with drum sampling and compatibility testing. Analysis of the first 550 drums indicated four compatibility groups; caustic, flammables,

combustibles, and inert liquids (7). Drums were consolidated and disposed of during the removal. Drums inside buildings were not removed.

On May 7, 1988, 15 soil and 8 composite samples from containers with compatible waste were collected from the site by Central States Environmental Services (CSES), an Illinois EPA contractor (7). One of the waste samples was collected from the soil surface. The samples were sent by Illinois EPA to a contract laboratory.

Two waste samples were collected on April 19, 1988 when the pre-removal inspection report listed a thick, black liquid spilled on the ground surface (8). On November 20, 1989, three more waste samples were collected from the site. Samples were collected where the surface spill listed above occurred, a paint vat in the northeast section of the dock area, and an open 55-gallon drum in the southeastern portion of the dock area. A direct reading instrument showed levels in the outdoor air near these three areas ranging from 15 parts per million (ppm) to 100 ppm of volatile organic chemicals (VOCs). A small fire was observed during the waste sampling.

On January 6, 1990, Illinois EPA collected 10 waste samples. Samples were analyzed for VOCs, semivolatile organic chemicals (SVOCs), and metals.

On March 2, 1990, three soil samples were collected by Illinois EPA from an area where transformer oil was spilled on the ground after a utility pole was cut down during an act of vandalism. The contamination was cleaned up by Union Electric and then clearance samples were collected. Union Electric collected 14 samples including a background sample. Three Illinois EPA samples were collected from the same locations as three of the Union Electric samples. These samples were analyzed for polychlorinated biphenyls (PCBs). Total PCBs detected in samples collected from the spill area ranged from less than 0.5 parts per million (ppm) to 8.5 ppm.

In March 1990, USEPA and its contractors analyzed waste for compatibility. As a result the materials were divided into eight waste streams. Waste streams included solids, caustic wastes and solvents and liquid paint.

On March 12 and 13, 2002, Illinois EPA collected 14 soil samples and 5 groundwater samples at the site. The sampling was part of the Combined Assessment. The groundwater samples were collected from four wells. Three of the wells were on the site and the other sample was from a background well across the street from the site.

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 were selected for further evaluation.

Waste samples do not have specific comparison values. On-site waste sample results were compared with soil values to determine chemicals of interest. Chemicals of interest in on-site waste samples are listed in Table 1. The chemicals found in the drums or wastes would be expected to be primary constituents of paint and contaminants of the site. VOCs such as ethylbenzene, toluene, and xylene were detected at high concentrations in the waste.

Groundwater samples collected by Illinois EPA in March 2002 had only a few chemicals present at detectable levels. Groundwater results were compared with drinking water health guidelines to determine the compounds of interest. Only six chemicals in groundwater are listed as chemicals of interest. These were benzaldehyde, dibenzofuran, phenanthrene, bis(2-ethylhexyl)phthalate, arsenic, and manganese.

Direct air readings were collected on the site when waste samples were collected in November 1989. The direct read instrument used detects total VOCs in air but does not indicate the concentrations of specific chemicals. The total VOCs readings near waste samples ranged from 15 ppm to 100 ppm.

Soil samples were collected primarily in areas of known or suspected contamination. Table 2 lists the chemicals of interest in soil. Interestingly, only five of the chemicals of interest in Table 2 are found in Table 1, Chemicals of Interest in Waste Samples. Of these five chemicals only 4-methyl-2-pentanone appears to be related to paint manufacture. The soil samples with elevated lead and chromium levels often contained fill or slag. A possible source of the lead is a defunct lead smelter located 2 blocks away (Figure 2). In addition to dieldrin, other chemicals of interest in on-site soil are polycyclic aromatic hydrocarbons (PAHs), which may be a result of on-site burning.

Exposure Analysis

Exposure to a chemical at a level that exceeds a comparison value does not necessarily mean that adverse health effects will occur. 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, a potential exposure pathway exists.

Area residents drink municipal water, which comes from the Mississippi River, and would not be impacted by site contamination. Therefore, the groundwater pathway is not a complete pathway at this site.

Air exposure to workers on the site and nearby residents likely occurred in the past; however, the level of exposure is not known. Air samples were analyzed for total VOCs next to surface waste on the site with a direct reading field instrument in November 1989. Maximum VOC concentrations of 100 ppm were detected. This level does not exceed the air health based values for acute or intermediate exposures for xylene and toluene, two of the most common VOCs found in paint.

Exposure to paint and paint solvents would likely have occurred to workers in the past. The concentrations of VOCs that the workers would have been exposed to may have been similar to the waste samples collected at the site. Exposure estimates were not performed for workers in the past. All site-related wastes have been removed from the site.

Exposure to soil is primarily limited to workers on the site and perhaps an occasional trespasser. Although there are holes in the perimeter fencing, there is no evidence of trespassing; however, should trespassing occur, it is not expected to occur for long periods of time. The site has been active for much of its existence and is still used for the storage of construction equipment. Worker exposure to on-site soil would have occurred in the past and may continue today.

IDPH assumed that 70 kilogram (kg) workers exposed to on-site soil would consume 100 milligrams (mg) of soil 5 days a week for 26 weeks per year for 10 years. IDPH assumed that the occasional trespasser would be a 30 kg child who would consume 200 mg of soil 2 days per week for 26 weeks during the year for 5 years. IDPH assumed that the chromium in the on-site soil was hexavalent chromium (Table 3). Hexavalent chromium is considered a carcinogen via inhalation; however, no data exist for chromium levels in air, so no inhalation cancer risk could be estimated.

IDPH used the Agency for Toxic Substances and Disease Registry (ATSDR) toxicity equivalency factors for PAHs to convert the sample results to benzo(a)pyrene (BaP) equivalents. The BaP equivalents were then used to estimate dose based on the exposure scenarios described above.

Based on these exposure scenarios, no adverse health effects would be expected from exposure to PCBs in on-site soil. A very low increased cancer risk may be expected from exposure to PAHs, PCBs, dieldrin, or chromium in on-site soil. Exposure to the greatest level of chromium detected in the on-site surface soil could pose a public health hazard; however, on-site soils are not readily accessible. Although lead is present at levels greater than 1,000 ppm in some locations, on-site soils are not readily accessible to children.

Child Health Initiative

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. Children may access the site through the holes in fence. Trespassing children playing in on-site soil may be exposed to elevated levels of lead.

Community Health Concerns

IDPH staff researched the site file and contacted the local health department, and no community health concerns were identified for this site.

Conclusions

Based on information reviewed, IDPH concludes that although the lead and chromium levels in some on-site soil samples are elevated, on-site soils are not readily accessible. Therefore the site poses no apparent public health hazard at this time. To ensure this conclusion remains accurate, the perimeter fence should be inspected and repaired. If children were able to access on-site soil, they could be exposed to elevated levels of lead and chromium.

Recommendations and Public Health Action Plan

IDPH recommends that:

1. Gaps in the gate and the fence should be repaired to discourage trespassing.
2. Workers wear appropriate personal protective equipment to reduce their exposure to soil containing slag and while excavating soil on the site.
3. Workers take care to clean shoes and clean clothes to reduce the tracking of contamination into their homes.

Preparer of Report

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Certification

This Morris Paint and Varnish 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.



Alan Yarbrough
Team Lead, CAT, CAPEB, DHAC, ATSDR

References

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2. Illinois EPA. Memorandum from Randy Ballard to LPC – Division File, January 26, 1988.
3. Belleville News-Democrat, Newspaper Article on March Fires at the Site. June 6, 1990.
4. USEPA, On-scene Coordinators Report, CERCLA Removal Action, Morris Paint and Varnish Company, East St. Louis, Illinois, October 28, 1991.
5. Illinois EPA, Memorandum from Tom Miller to Glenn Savage. December 18, 1990.
6. CERCLA Combined Assessment Report, Illinois EPA, September 10 , 2002.
7. Illinois EPA, Memorandum from Tom Miller to Division File, DLPC. May 26, 1988.
8. Illinois EPA, Memorandum from Mike Grant to Bruce Carlson. June 15, 1989.
9. Illinois EPA, Memorandum from Tom Miller, OSC, Collinsville to LPC – Division File Re: Tom Miller Memo dated August 22, 1989. December 7, 1989.
10. Agency for Toxic Substances and Disease Registry. Toxicological profile for lead. Atlanta: US Department of Health and Human Services; 1999 July.

Table 1. Chemicals of Interest in Waste Samples (1988 to 1990 Sampling Events)

Chemical	Maximum in ppm (either mg/kg or mg/L)	Soil Comparison Value for Non- Cancer Health Effects in ppm (children/adult)	Source	CREG
Benzene	50	30/400	CEMEG	10
Ethylbenzene	88,000	5,000/70,000	RMEG	NV
Toluene	170,000	1,000/10,000	IEMEG	NV
Trichloroethene	320	400	Acute Pica Child	UR
Xylenes, Total	450,000	10,000/100,000	CEMEG	NV
4-Methyl-2-pentanone (MIBK)	290,000	NL	NL	NL
Benzyl alcohol	6.2	NL	NL	NL
Vinyl acetate	20	NV	NV	NV
Naphthalene	6,000	1,000/10,000	RMEG	NV
Lead	8.8	NV	NV	NV
Total PCBs	6.1	NV	NV	0.4

ppm – parts per million

mg/kg – milligram per kilogram

mg/L – milligram per liter

CREG - Cancer Risk Evaluation Guide for 1 in 1,000,000 excess cancer risk

CEMEG-Chronic Environmental Media Evaluation Guideline

RMEG – Reference Dose

IEMEG – Intermediate Environmental Media Evaluation Guideline

UR – Under review

NV - No Value

NL – Not Listed

Table 2. Chemicals of Interest in Soil at Morris Varnish and Paint (1988 to 2002 Sampling Events)

Chemical of Interest	Pre-Remediation	Post Remediation		Comparison Value	
	Maximum value in mg/kg	Surface (0-12")	Subsurface (>12")	Non-Cancer (children/adult)	Cancer
Acenaphthylene	0.022	0.51	0.48 J	NL	NL
Benzo(a)anthracene	0.44	3.5	0.57	NV	NV
Benzo(a)pyrene	0.35	4.0	0.63	NV	0.1
Benzo(b)fluoranthene	0.3	3.8	0.83	NV	NV
Benzo(g,h,i)perylene	0.27	2.0	0.49	NV	NV
Benzo(k)fluoranthene	0.34	3.3	0.62	NV	NV
Chrysene	0.4	3.7	0.71	NV	NV
Dibenzo(a,h)anthracene	0.1	0.66	0.22 J	NV	NV
Indeno(1,2,3-cd)pyrene	0.25	1.8	0.45	NV	NV
Phenanthrene	0.55	10 E	0.57	NV	NV
Arochlor 1254	2.4	1.6	3.9	1/10	NV
Total PCBs	11	8.5	3.9	NV	0.4
Dieldrin	NA	0.29	ND	NV	0.04
Chromium (VI)	NA	12,700	663	200/2000	NV
Lead	NA	55,800	4,370	NV	NV

mg/kg = milligrams per kilogram

J = Estimated value

UR – Under review

NL – Not Listed

NA=Not Analyzed in Sample

Bold Italic = Exceeded CV

ppm = parts per million

ND= Nondetect

NV - No Value

E=Estimated Value

Table 3. Dose Estimation for Chemicals of Interest at Morris Varnish and Paint.

Chemical of Interest	Post-Remediation (0-12") Maximum values (mg/kg)	Estimated Worker Average Daily Dose (mg/kg-day)	Estimated Trespasser Average Daily Dose (mg/kg-day)	USEPA Reference Dose or ATSDR Minimal Risk Level	Estimated Worker Lifetime Daily Dose (mg/kg-day)	Estimated Trespasser Lifetime Daily Dose (mg/kg-day)	EPA Oral Cancer Slope Factor 1/(mg/kg-day)	Increased Cancer Risk-Worker	Increased Cancer Risk-Trespasser
Benzo(a)pyrene	4	2.0 E-6	3.81 E-6	N/A	2.9 E-7	2.7 E-7	7.3 E+0	2.1 E-6	2.0 E-6
Arochlor 1254	1.6	8.0 E-7	1.52 E-6	2.0 E-5	1.1 E-7	1.1 E-7	2.0 E-5	2.3 E-12	2.2 E-12
Total PCBs	8.5	4.3 E-6	8.10 E-6	N/A	6.2 E-7	5.8 E-7	2.0 E+0	1.2 E-6	1.2 E-6
Dieldrin	0.29	1.48 E-7	2.80 E-7	5.0 E-5	2.1 E-8	2.0 E-8	1.6 E+1	3.4 E-7	3.2 E-7
Chromium (VI)	12,700	<i>6.4 E-3</i>	<i>1.21 E-2</i>	3.0 E-3	9.1 E-4	8.6 E-4	N/A	N/A	N/A
Lead	55,800	2.8 E-2	5.40 E-2	N/A	4.0 E-3	3.9 E-3	N/A	N/A	N/A

N/A = none available

Bold Italic = Exceeded reference dose or minimal risk level

IDPH assumed that 70 kilogram (kg) workers exposed to on-site soil would consume 100 milligrams (mg) of soil 5 days a week for 26 weeks per year for 10 years. IDPH assumed that the occasional trespasser would be a 30 kg child who would consume 200 mg of soil 2 days per week for 26 weeks during the year for 5 years. IDPH assumed that the chromium in the on-site soil was hexavalent chromium (Table 3). Hexavalent chromium is considered a carcinogen via inhalation; however, no data exist for chromium levels in air, so no inhalation cancer risk could be estimated.

Figure 1 - Morris Paint and Varnish - Site Location Map

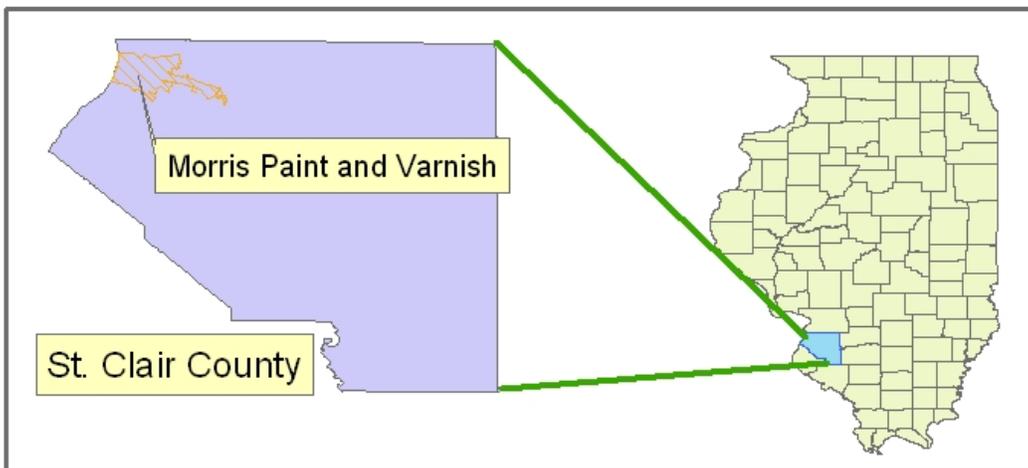
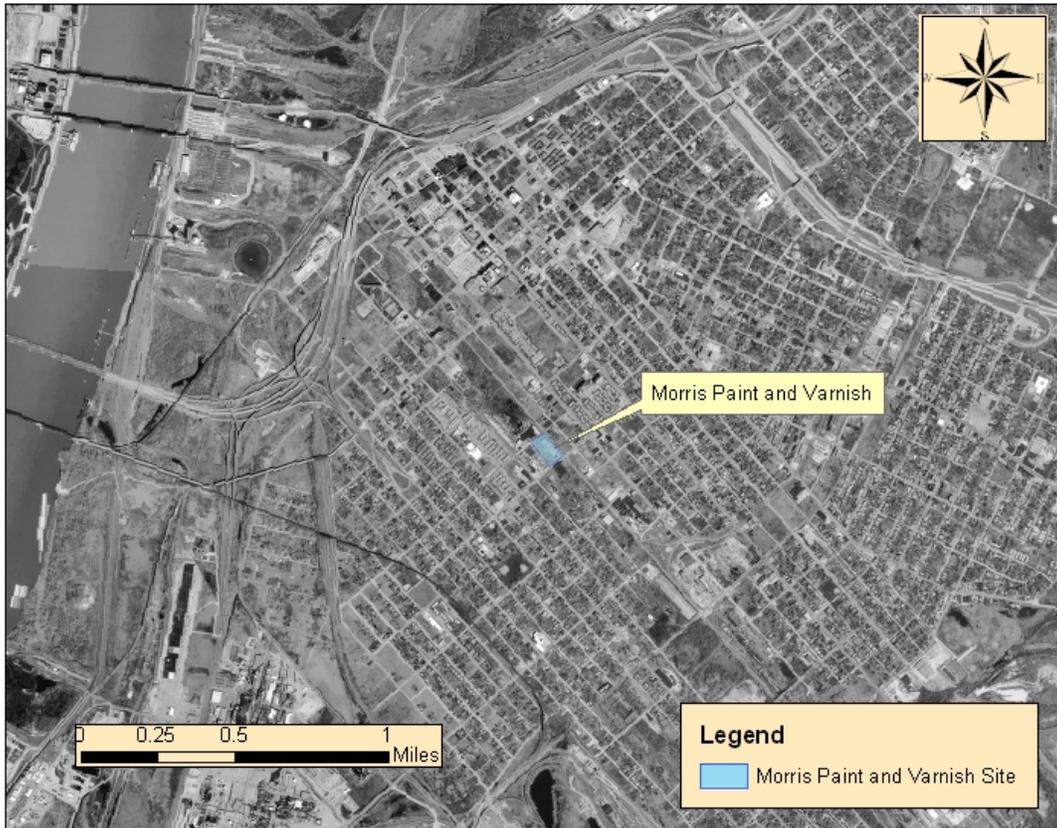


Figure 2 - Morris Paint and Varnish - Site Map



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.

