

Health Assessment for

FRIED INDUSTRIES

CERCLIS NO. NJD041828906

EAST BRUNSWICK, MIDDLESEX COUNTY, NEW JERSEY

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Agency for Toxic Substances and Disease Registry
U.S. Public Health Service

**HEALTH ASSESSMENT
FRIED INDUSTRIES SITE
MIDDLESEX COUNTY
EAST BRUNSWICK, NEW JERSEY**

Prepared by:
Division of Science and Research
New Jersey Department of Environmental Protection (NJDEP)
and
Environmental Health Service
New Jersey Department of Health (NJDOH)

Prepared for:
Agency for Toxic Substances and Disease Registry (ATSDR)

BACKGROUND

The Fried Industries Site is listed by the United States Environmental Protection Agency (EPA) as a Superfund site because of groundwater, surface water and soil contamination that resulted from the mismanagement of industrial chemicals. The facility is located on approximately 26 acres of land in East Brunswick, New Jersey, and includes a large pond and swamp/wetlands area. In addition, this Superfund site is located directly atop the recharge zone for the Farrington Sand Aquifer System, which supports the local township's drinking water supply. Originally, the property served as a commercial sand and clay pit and was later converted to a manufacturing facility for detergents and floor finishes. The site now includes leaking drums of potentially hazardous substances, buried drums, and numerous process and storage tanks.

Under the Remedial Investigation/Feasibility Study (RI/FS), samples from the site were collected in 1989. A report on the RI has been drafted, is under review by the New Jersey Department of Environmental Protection (NJDEP), and was not received in time to include in the current version of the health assessment. EPA is the lead agency for remediation efforts at the Fried Site.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

A. On-Site Contamination

Sampling for environmental contamination, to date, has been limited. Consequently, the site's water, soil and ambient air are not well characterized.

Soil samples taken from different on-site locations revealed extensive contamination by various organic chemicals, phthalates and heavy metals, as illustrated in Table 1 below. High concentrations of similar compounds were also detected in process tanks, septic tanks and cesspool liquids and sludge samples taken on-site. All samples were collected and analyzed by the EPA either in December 1983 or May 1985.

Table 1: Principal Soil Contamination Detected On-Site and Applicable or Relevant and Appropriate Requirements

<u>CONTAMINANT</u>	<u>LEVELS (mg/kg)</u>	<u>Guidelines(ug/l) (1)</u>
Tetrachloroethylene	0.12a - 12,000a	1
Bis-(2 ethylhexyl) phthalate	2.0a - 230a	
1,1-Dichloroethylene	0.0098a - 3.0b	2
1,1,1-Trichloroethane	0.190a - 72b	26
Mercury	0.61a - 5.3b	1

Footnotes: (a) sample date, 12/83; (b) sample date, 5/85;
(1) Guidelines are from N.J.A.C. 7:10-5.1 et. seq. and
7:10-16.7

Analysis of water in a drainage ditch that runs along the western border of the property revealed seven organic chemicals (methylene chloride, 1,1-dichloroethane, 1,1,2,2-tetrachloroethane, toluene, diethyl phthalate, di-N-ocetyl phthalate and 4-chlorophenyl ether) at levels below the EPA Health Advisories. Based on EPA aerial photographic analysis, it is believed that the extensive network of ponds, swamp/wetlands, and brooks on the site may be contaminated. These surface waters have never been tested for chemical contamination. Analysis of an on-site well revealed a high level of methylene chloride (2000 ug/l).

B. Off-Site Contamination

With the Fried Site being situated directly above the recharge zone for a principal water aquifer, there is

marked concern over the extent of groundwater contamination that has occurred off-site. In 1983, the Middlesex County Department of Health detected several volatile organic compounds (VOCs) in the private wells of residents downgradient from the Fried Site. The Middlesex County Department of Health believes that all wells were subsequently closed. Table 2 lists those contaminants of greatest concern. No other off-site sampling has been conducted.

Table 2: Groundwater Contamination Detected Off-Site in 1983

CONTAMINANT	LEVELS (ug/l)	STANDARD (ug/l) (1)*
Chloroform	2 - 250	--
Benzene	2 - 28	1
Vinyl chloride	5	2

(1) All standards are N.J.A.C. 7:10-5.1 et seq. and N.J.A.C. 7:10-16.7.

C. Quality Assurance/Quality Control

Analysis of the environmental samples were conducted by a number of different laboratories with limited information on quality assurance/quality control (QA/QC). The off-site water testing was conducted by the contract firm, Accutest Laboratories, for the Middlesex County Department of Health. Accutest is EPA approved and certified by the New Jersey Department of Environmental Protection (NJDEP). All other samples were analyzed by the laboratories of the USEPA between 1983 and 1985, during which minimal internal QA/QC oversight was in place. Analysis techniques and quality control programs may have been modified since 1983. The main concerns in this Health Assessment center around the need to better characterize the site. Therefore, although the QA/QC review of the data may not have been adequate, the data can be used to qualitatively evaluate the site. Data that is collected in the future will undergo acceptable QA/QC reviews. The greater the confidence in the quality of the data, the greater the confidence in the contents and conclusion of this health assessment.

D. Physical Hazards

The abandoned trailers and railroad cars on the site pose potential hazards to children that may be playing on the site.

SITE VISIT

During a recent site visit by NJDEP and the New Jersey Department of Health (NJDOH), several youths were seen playing on the site on all-terrain vehicles (ATVs). From conversations with them, it became clear that the Fried Site is the central gathering spot for many young adults in the area. Up to 20 youths per day use the area for dirt bike activities. In addition, many residents use the on-site pond for fishing. This was confirmed both by previous site visits and the statement by the owner that the pond is regularly stocked with bass. There are no signs posted anywhere indicating that the property is a hazardous waste site nor is there any attempt to limit access to the facility. In an interview the owner stated that he had given youths permission to use the land for dirt bike activities.

Because of the sandy dust bowl-like nature of the property, great clouds of dust were created by the dirt bikers raising serious concerns about inhalation exposures. Most of the youths wore helmets with facial protection while riding, but others sitting nearby were exposed to high levels of dust. Dermal exposure may also be much higher than normally estimated. Play on the site included flinging mud balls at each other. The mud balls were from the edge of the pond. Aside from the consumption of potentially contaminated fish, ingestion of hazardous substances from the site may also occur through incidental contact with foods eaten on the property. The area was highly littered with soda and beer cans along with pizza boxes and other signs that the area serves as a "hang-out". According to the people on site that we spoke to, they often used to have bonfires and cook hot dogs over the fire.

POTENTIAL ENVIRONMENTAL AND HUMAN EXPOSURE PATHWAYS

A. Environmental Pathways

Groundwater contamination from the Fried Site appears to have occurred, as evidenced by local contamination of private wells. The extent of groundwater contamination resulting from this site depends on the chemical concentrations and hydrogeological conditions, both of which require further investigation. There is a serious potential for surface water contamination of the property's pond and wetlands which discharge into the nearby Lawrence Brook, Bog Brook and eventually the Lawrence Lake Reservoir system.

Potential human exposure pathways to chemical contaminants from the Fried Site include ingestion, dermal contact, and inhalation.

Ingestion of contaminated surface water, groundwater supplies, and soil are possible. There is substantial evidence that various food items are presently consumed on-site -- as demonstrated by empty pizza boxes, candy wrappers and beverage containers -- and incidental contamination is likely. Further exposure via the food chain could potentially occur from the consumption of fish or game caught around the site area, along with the ingestion of residential garden crops grown in the nearby locale.

Dermal contact with contaminants could also occur through bathing in contaminated groundwater and contact with surface water areas and soil. During the site visit, it was observed that youths, playing on the site, came into extensive contact with potentially contaminated mud from the pond. Dermal exposure occurred both from airborne dust contamination and from contamination from the handling and playing with pond mud/sediment.

Around the site's tank areas and along side the water sources, odors associated with volatile organic chemicals were detected indicating that appreciable inhalation exposure to these compounds may occur on-site. Because of the sandy nature of the site, inhalation of contaminated dust and particulate matter may also potentially occur. During motor bike activities on the site or even wind gusts, large clouds of dust were noted.

DEMOGRAPHICS

The site is in a moderately residential area with an approximate population of 25,000 within a 3/4 mile radius. Adjacent to the northern border of the property is the large community of Milltown. The area is rapidly expanding in population, primarily with single-family housing developments. Based on site visits to the site, the Fried Site appears to act as the local park for many of the area's residents.

Demographic data gaps that need to be filled include the identification of sensitive populations near the site, the number of potable wells that could potentially be affected by the site, and the size of the population within a 2-3 mile radius of the site.

COMMUNITY CONCERNS

Community concerns began at this site in June 1983, when a local resident filed a complaint about foul-tasting well water with the Middlesex County Health Department. Consequent investigations by EPA, NJDEP, New Jersey Division of Criminal Justice, and law enforcement officials led to the discovery of contamination on the Fried property.

Most concerns over the quality of groundwaters were ameliorated later in 1983 when those residents using well water were connected to the municipal water supply. Currently, interest in the site is limited to local officials and residents immediately adjacent to the site. It should be noted that, while there is community awareness with regard to environmental issues, this interest is directed at another unrelated issue, the closure of a nearby county landfill.

Review of EPA and NJDEP documents, community relations plans, meeting transcripts, and contact with local health and municipal officials revealed several general areas of community concerns with regard to the Fried Industries Site:

Ground water contamination. Of concern is the possible contamination of area municipal wells. Also of concern is a pond (used for fishing) which is located on site and drains into brooks which feed the Farrington Lake Reservoir.

Open access to the site. The site is not fenced, and is used for recreational purposes by local children despite the sporadic efforts of local authorities to prevent open access.

Health Effects. Of concern are the potential health effects resulting from the consumption of contaminated water, and the exposure of children playing on-site.

Financial responsibility. It is the consensus of local citizens and officials that potential responsible parties (PRPs) be held responsible for all costs and damages which have been incurred.

EVALUATION

Evaluating the available data on groundwater contamination, there are indications that this NPL site potentially poses a public health threat. Even though the off-site wells are no longer in use, the 1983 private well test results reveal that marked groundwater contamination from the

Fried Site has occurred. Until further off-site monitoring is conducted, one conservatively assumes that contamination has continued to migrate beyond the property boundary and could potentially expose the public to unsafe water supplies.

Of immediate concern is the on-site well water levels of methylene chloride at 2000 ug/L. EPA's 10-day Health Advisory for methylene chloride is 1500 ug/L. NJDEP established the Maximum Contaminant Level (MCL) at 2 ug/l based on a lifetime excess cancer risk of one in a million. Animal studies indicate that subchronic or chronic exposure to methylene chloride can cause both liver and lung neoplasms in addition to liver disorders and benign mammary gland tumors.

Additionally, the levels of benzene (2-28 ug/l) detected in the off-site groundwater supplies exceed NJDEP's of 1 ug/L. Benzene is listed as a known human carcinogen by both EPA (Group A) and the International Agency for the Research of Cancer (IARC) (Category 1). Benzene exposure also has been causally linked to aplastic anemia, suppression of various cellular blood and acute myelogenous leukemia.

Vinyl chloride was also found contaminating groundwater supplies near the Fried Site at levels above standards. Vinyl chloride is a known human carcinogen (EPA, Group A; IARC, Category 1) which has induced liver tumors in rats, mice, hamsters and humans. The NJDEP has estimated that 0.08 ug/L of vinyl chloride in water corresponds to a lifetime excess cancer risk of one in a million ($1.0E-6$). EPA has established vinyl chloride RMCL and MCLs for drinking water at zero and 1 ug/l, respectively. A groundwater well outside the Fried Site contained vinyl chloride at levels of 5.0 ug/l.

Chloroform is designated by the EPA as a carcinogen. Animal studies indicate that chronic chloroform exposure can lead to liver and kidney damage, including necrosis and tumor formation. Chloroform, along with other trihalomethanes, can be produced during the chlorination process of water supplies and can therefore be present in small quantities of chlorinated drinking water. The EPA has set the Maximum Contaminant Level for total trihalomethane at 100 ug/l for water supplies treated by chlorination. For non-chlorinated potable groundwater NJDEP has used 5 ug/l as an acceptable concentration of any carcinogenic volatile organic compound (including chloroform). Chloromethane levels were detected in the off-site groundwater wells (which are nonchlorinated) at a range of 2-250 ug/l.

Extensive soil contamination by hazardous substances exists on the Fried Site. In particular, high levels of tetrachloroethylene (0.12-12,000 mg/kg) were detected. Mercury was detected in soil samples between 0.61 and 5.3 mg/kg. While there are no federal guidelines or criteria for mercury soil contamination, the NJDEP has established an action level for mercury in soil of 1.0 ppm.

While there is sufficient information to raise important health concerns, the health assessment currently is limited by gaps in the environmental and demographic information. To adequately address potential exposure to groundwater contamination, the extent of off-site groundwater contamination require further investigation and evaluation. Media on-site that need to be sampled include soil, surface water, mud surrounding the lake, fish in the lake, and air. This work is covered by the Work Plan that has been approved for the site. Because of the significant potential contamination in the pond and the public use of the pond, fish, water, and sediment samples from the site's pond need to be analyzed for chemical content. On-site soil and possibly air measurements are necessary to assess the direct contact and inhalation concerns for the on-site workers and frequent land users. In particular, it is important to accurately assess the youth's exposures resulting from playing on the site.

RECCOMENDATIONS AND CONCLUSIONS

On the basis of the information reviewed, the Fried Industries Site is considered to be a potential public health concern because humans may be exposed to hazardous substances at concentrations that could result in adverse health effects. As noted in the Environmental Contamination and Physical Hazards and the Evaluation sections human exposure to contaminants from the site could occur via ingestion, inhalation, and dermal absorption.

Because of the high potential for significant exposure, public access to the Fried Industrial Site needs to be restricted immediately. While such a response requires that a fence be erected around the site, community notification and strategically-placed warning signs are also essential to adequately protect the public. The community must be notified about the risks associated with fishing in a potentially contaminated pond, as well as the hazards posed to children playing on the site.

There are many gaps, that need to be filled, in what is known about the environmental concentration of chemicals

on-site and the demographics around the site. Many of these gaps are covered in the RI/FS Work Plan. Of primary concern is an urgent need for additional off-site testing to be conducted for groundwater contamination. The last specific off-site analysis was conducted in 1983 on 5 private residential wells near the Fried Site. Considerable groundwater movement and contamination may have occurred since then. Middlesex County has randomly tested water supplies in the area, but their survey process was not based on potential plume or groundwater flow from the Fried Site.

In accordance with CERCLA as amended, the Fried Industries site has been evaluated for appropriate follow-up with respect to health effects studies. Since human exposure to on-site and off-site contaminants may currently be occurring and may have occurred in the past, this site is being considered for follow-up health studies. After consultation with Regional EPA staff and State and local health and environmental officials, the Division of Health Studies, ATSDR and NJDOH, will determine if follow-up public health actions or studies are appropriate for this site.

This Health Assessment was prepared by the State of New Jersey, Department of Health, Environmental Health Service, under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry. The Division of Health Assessment and Consultation and the Division of Health Studies of ATSDR have reviewed this Health Assessment and concur with its findings.

REFERENCES

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Fried Industries Update
April 19, 1990

The Remedial Investigation Report has been drafted. According to NJDEP, the site is posted and there is a plan to have the site guarded, to keep off trespassers. In addition, it was determined that the on-site pond was not contaminated (Personal communication, NJDEP Technical Coordinator). Information in the RI will be incorporated into this health assessment, in the form of an addendum, when the health assessment is revised.