

**Health
Assessment
for**

SPENCE FARM

OCEAN COUNTY, PLUMSTED TOWNSHIP, NEW JERSEY

02NJD980532816

APR 6 1989

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

SUMMARY

The Spence Farm Site (Spence) is a National Priorities List (NPL) site located approximately 2 miles northeast of the Town of New Egypt, in Plumsted Township, Ocean County, New Jersey. Certain areas of the farm served as disposal sites for a variety of industrial and domestic wastes. Industrial wastes, allegedly from Morton Thiokol Corporation (Thiokol), were dumped in scattered low-lying, wooded areas throughout the 30-acre site. The Record of Decision (ROD) signed September 1984 mandated the removal and off-site disposal of all drums and lab packs, excavation and off-site disposal of visibly contaminated soil, construction of sediment controls during excavation and sampling efforts, and monitoring of on-site wells annually for 5 years. The removals have been completed.

BACKGROUND

A. SITE DESCRIPTION

The Spence Farm Site, located near New Egypt, Ocean County, New Jersey, is approximately 30 acres in size. It has been determined that some of the disposal areas were within the 100-year flood plain. From the 1950's through the 1970's wastes were disposed of in the wooded and low-lying areas of the site. There were drums, buried and on the surface, present at the site. Some of the drums were intact while others appeared to have been opened prior to dumping. Other drums had rusted enough to allow their contents to leak out. There were also lab packs (jars and bottles that laboratories receive their chemicals in) scattered throughout the disposal area.

The removal and disposal of the surface contamination (drums, lab packs, and some of the visibly contaminated soil) has occurred. The remaining soil was stored in stock piles located on-site and off-site. It was reported that very recent soil sampling of the piles indicated the presence of polychlorinated biphenyls (PCB's). The stock piles were removed from the site January 1989 and placed in a hazardous waste landfill.

B. SITE VISIT

ATSDR has not conducted a site visit at this time.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

A. ON-SITE CONTAMINATION

Approximately 430 55-gallon drums were estimated to be on-site with 46 still intact and containing some wastes. Laboratory packs numbered less than 2,000. There were 15 samples taken from 11 test pits dug in suspected burial areas. The results of the soil analyses indicated different compounds for each area. Most of the identification of the contaminants was made through computer library searches using tentative mass spectrometry data. The majority of the organic compounds identified were not priority pollutants. The concentrations of organic priority pollutants detected were low, ranging from a few micrograms per kilogram to a few milligrams per kilogram. The maximum concentration of methylene chloride was 71 ug/kg, of 1,1,2,2-trichloroethane was 800 ug/kg, and bis (2-chloroethoxy) methane was 2,800 ug/kg. Low maximum concentrations of lead and chromium were also reported, 220 mg/kg and 38 mg/kg, respectively. These metal concentrations are well below the typical background soil concentrations for the eastern United States. The excavated soil has recently been sampled and was shown to contain PCB's at concentrations ranging from 0 to 160 ppm. There were high concentrations of long chain organic acids and polynuclear aromatic hydrocarbons (PAH's). The concentrations of contaminants inside the intact drums were higher, however, it has been reported that all drums and lab packs were removed from the site and placed in an appropriate Resource Conservation and Recovery Act landfill.

Sediment sampling yielded similar results to the test pits with the exception that the number of compounds found were fewer and their concentrations were lower. Bis (2-ethylhexyl) phthalate, also known as di (2-ethylhexyl) phthalate (DEHP), di-n-octylphthalate, methylene chloride, chromium, copper, mercury, and zinc were the only priority pollutants detected. Surface water samples indicated the presence of mercury, zinc, and toluene. There were several tentatively identified compounds detected in both media as well.

Groundwater sampling of the nine monitoring wells indicated several tentatively identified compounds. The priority pollutants identified included acetone, di-n-octylphthalate, DEHP, phenol, zinc, chromium, and mercury.

B. OFF-SITE CONTAMINATION

Six off-site potable water samples were analyzed. The only compounds detected were zinc and mercury. The mercury concentration was similar to concentrations found in on-site groundwater, all of which were an order of magnitude less than the Environmental Protection Agency (EPA) drinking water Maximum Contaminant Level and New Jersey's drinking water standard. However, two residential wells, the Braumstein and the Blizcz, had mercury concentrations of 0.009 mg/l and 0.005 mg/l, respectively. These concentrations exceed the drinking water standard for mercury. These wells are upgradient of the site and are therefore not believed to be contaminated with any contaminants from the site. The concentrations of zinc found in the wells were not of public health concern.

C. PHYSICAL HAZARDS

There do not appear to be any physical hazards present at this site.

DEMOGRAPHICS OF POPULATION NEAR THE SITE

The site is located in a rural area approximately 1.5 miles northeast of the Town of New Egypt. Land use in the area is generally agricultural with low density residential development. New Egypt, population approximately 2,100 (1980 census), is commercialized and provides the basic community services. There are two municipal drinking water wells located approximately 1.5 miles southwest of the site and are about 250 to 275 feet deep.

EVALUATION

A. SITE CHARACTERIZATION (DATA NEEDS AND EVALUATION)

1. Environmental Media

The groundwater sampling required as a result of the ROD has not yet been conducted. Thiokol and the EPA are presently negotiating the details of the well installation and sampling program at this time. The sampling of the other environmental media appears to be adequate, if somewhat dated.

2. Land Use and Demographics

Information should be provided which would clarify whether or not Spence is an operating farm or is used as a residence.

3. Quality Assurance and Quality Control

Conclusions contained in this Health Assessment are based on the information received by ATSDR. The accuracy of these conclusions is determined by the availability and reliability of the data.

B. ENVIRONMENTAL PATHWAYS

The surface soils removed from the site and placed in stock piles both on-site and off-site were removed from the site January 1989 and placed in a hazardous waste landfill. Post remedial sampling results are not yet available for review. There is a potential that contamination at concentrations of public health concern remains in the surface soil where the stock piles had been located. Migration of contaminants from the surface soil could occur through leaching and later groundwater transport, erosion by rain or flood, and in some instances, wind erosion.

There are two water containing formations in the area of Spence Farm. The Kirkwood Formation which is made up of two units, the upper, silt and very fine silt unit, and the lower, dense clayey silt unit. There are a few very permeable sand and gravel lenses in the lower unit. The second water bearing formation is the Manasquan Formation which is regionally impermeable. However, near Spence Farm it is more permeable than either Kirkwood unit above. The upper 2 to 5 feet of the Manasquan Formation consists of coarse sands and gravels and a green silty clay matrix. The contaminants found in the groundwater are located in both the Kirkwood Formation and the Manasquan Formation. The groundwater sampling is very out-dated. The sampling program under development should provide more current data.

Near the center of the site two tributaries merge and become a stream which flows to the northeast. The groundwater at the site flows towards these surface water bodies, allowing the contamination in the groundwater to migrate to the surface water. Both the surface water and the sediments have shown volatile organic compound contamination.

There have been no biota samples taken at this site. As a result, biota uptake of contamination is a potential environmental pathway of concern.

There have been no air samples taken at this site, therefore, air is a potential environmental media of concern.

C. HUMAN EXPOSURE PATHWAYS

Potential exposures through inhalation of contaminated dusts, incidental ingestion, or dermal contact with contaminated soil are of concern for workers or trespassers on-site. Off-site inhalation exposure to contaminated dusts is also of concern.

The farm is operating, therefore, there is a potential that the groundwater on-site is being used for domestic purposes, for irrigation, or both. If the water on-site is being used there is a potential for exposure through ingestion, inhalation, or dermal absorption of groundwater contaminants. Sampling will become more definitive with the completion of monitoring wells and the potential health effects related to using the contaminated groundwater will be better defined. The residential wells sampled did not appear to contain any contamination of public health concern.

There is no known recreational or domestic usage of the surface water located near the site. Therefore, since the usage of the surface water has not been established there is a potential for incidental ingestion or dermal absorption of contamination present in the contaminated surface water.

Since the air and biota were not adequately characterized, there is a potential human health concern for inhalation or ingestion exposure, respectively.

PUBLIC HEALTH IMPLICATIONS

As discussed above, post remedial sampling results are not yet available, therefore, there is still a potential public health concern related to surface soils in the areas where the stock piles had been located. Also the groundwater contamination is of potential public health concern since the use of it is unknown.

There is little information available regarding the health effects of the the various tentatively identified compounds detected in the various media on-site. Therefore, the public health implications of these contaminants can not be discussed.

Acute PCB-related health effects typically occur at higher concentrations than those detected on-site. However, for this site, the primary identified potential health effects, resulting from exposure to PCB's in the soil through ingestion, inhalation, and dermal contact, are carcinogenic effects. PCB's have been designated as Group B2--Probable Human Carcinogens (EPA 1987). This designation is based on experiments which demonstrated the induction of hepatocellular carcinomas in laboratory animals fed high doses of PCB's in their diet (Kimbrough et al., 1975, Norback and Weltman, 1985).

DEHP is believed to have low acute toxicity and chronic toxicity. There is some strong evidence to indicate that DEHP may be a liver carcinogen.

The concentration of the other contaminants on-site were generally low and are of minimal health concern.

CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

Based on the information reviewed, ATSDR has concluded that this site is of potential public health concern because of the potential risk to human health resulting from the possible exposure to hazardous substances at concentrations that may result in adverse health effects. As noted in the Environmental Pathways and Human Exposure Pathways Sections above, human exposure to soil, sediment, groundwater, surface water, air, and biota may have occurred in the past or may be occurring now. The groundwater monitoring discussed in the ROD will help determine what remediation is required for the groundwater. Once the post remedial soil samples are available it will be possible to determine whether or not the surface soil is of public health concern. The ROD does not address surface water, air, or biota.

B. RECOMMENDATIONS

1. During remediation, measures should be taken to protect people on-site and off-site from exposure to any vapors that may be released. Workers on-site should be provided adequate protective equipment and training, in accordance with 29 CFR 1910.120, and should follow appropriate National Institute for Occupational Safety and Health and Occupational Safety and Health Administration guidelines, when involved in activities that may result in an exposure. During working hours, appropriate monitoring should be utilized at the worksite periphery to protect nearby workers and residents.
2. The information requested in the Data Needs and Evaluation Section of this Health Assessment should be provided to ATSDR.
3. The groundwater monitoring program discussed in the ROD should be initiated to assist in determining the current quality of the area groundwater.
4. In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act as amended, the Spence Farm site has been evaluated for appropriate follow-up with respect to health effects studies. Inasmuch as there is no extant documentation or indication in the information or data reviewed for this Health Assessment that exposure to site contaminants is currently occurring or has occurred in the past, this site is not being considered for follow-up health studies at this time. However, if data become available suggesting that human exposure to significant levels of hazardous substances is currently occurring or has occurred in the past, ATSDR will reevaluate this site for any indicated follow-up.

PREPARERS OF REPORT

Environmental Reviewer: Susan L. Mueller, Environmental Health Specialist, Health Sciences Branch.

Regional Representative: Denise Johnson, ATSDR Regional Representative, Region II.

REFERENCES

1. Remedial Investigation, Vol. I -- Main Report, Elson T. Killian Associates, Inc., August 1984.
2. Remedial Investigation, Vol. II -- Appendix A, Elson T. Killian Associates, Inc., August 1984.
3. Draft, Detailed Evaluation of Alternatives, Elson T. Killian Associates, Inc., July 1984.
4. Record of Decision -- Remedial Alternative Selection, EPA Region II, September 1984.
5. Report on Sampling and Analytical Data, International Technology Corporation, April 1986.
6. Report on Sampling and Analytical Data, International Technology Corporation, June 1986.
7. Report on Sampling and Analytical Data, International Technology Corporation, August 1987.
8. Report on Sampling and Analytical Data, International Technology Corporation, March 1988.
9. USEPA Drinking Water Criteria Document for Polychlorinated Biphenyls (PCB's) ECAO-CIN-414, 1987.
10. Kimbrough, R.D., Squire, T.A., Linder, R.E., Strandberg, J.D., Montali, R.J., Burse, V.W., JNCI 55: 1453-1459, 1975.
11. Norback, D.H. and Weltman, R.H., Environ. Health Perspect. 60: 97-105, 1985.