

Petitioned Health Consultation

**BROOKSIDE SCHOOL SITE
SARASOTA, SARASOTA COUNTY, FLORIDA**

AUGUST 10, 1999

**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**

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR 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 which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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PETITIONED HEALTH CONSULTATION

BROOKSIDE SCHOOL SITE

SARASOTA, SARASOTA COUNTY, FLORIDA

Prepared by:

**Petition Response Section
Exposure Investigation and Consultation Branch
Division of Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry**

Background and Statement of Issues

A citizen requested the Agency for Toxic Substances and Disease Registry (ATSDR) evaluate environmental data collected at the Brookside School site and determine if organochlorine pesticides from a nearby apartment complex pose a current or future public health threat to students, faculty, and workers at the school [1].

The Brookside School site is located in a mixed residential and commercial area at 3636 South Shade Avenue, in Sarasota, Florida [2]. The school property is approximately 20 acres in size [3]. There are residential properties located to the north and east, and a commercial property is situated to the south. Located west of the site is an apartment complex (Sunland Garden Condominiums) [4]. The topography of the school property indicates that it is located slightly (approximately 1 foot) up gradient from the apartment complex [5].

Organochlorine pesticides were applied at the apartment complex west of the school property. Previous surface soil sampling indicated organochlorine pesticides were present in the soils in the flower beds near Unit 15 of the apartments. A resident living in these apartments raised concerns about the potential migration of organochlorine pesticides from the soils at her apartment complex to the subsurface soils of the adjacent school property. The resident's concern was that during construction activities at the school subsurface soil would be brought to the surface where children would be exposed to the organochlorine pesticides [1,3]. Based on the concerns from the resident, the school board hired an environmental contractor to collect subsurface soil and groundwater samples from the school property to determine if organochlorine pesticides had migrated from the apartment complex via the subsurface soil and groundwater to the school property [2-4].

On September 15, 1998, the Florida Department of Environmental Protection Agency collected two surface soil samples from the apartment complex (S-1, S-2; collected from two planter beds around the external stairways on the east side of the building, just north and south of Unit 15) and two surface soil samples from Brookside School (S-3, S-4, collected near the boundary lines of the two properties) [6]. The surface soil samples were collected from a depth of 0 to 3 inches and analyzed for organochlorine pesticides. Table 1 shows the levels of organochlorine pesticides detected in these samples. No other organochlorine pesticides were detected in the samples.

Table 1: Pesticide analyses of surface soil samples collected on September 15, 1998 [6]			
<i>Location</i>	<i>Chlordane [ppm]*</i>	<i>Heptachlor [ppm]</i>	<i>Dieldrin [ppm]</i>
Apt. Complex S-1	17	0.056	none detected
Apt. Complex S-2	3.8	0.038	1.0
Brookside School S-3	0.5	none detected	none detected
Brookside School S-4	0.97	none detected	none detected
* ppm = parts per million			

On January 22 & 24, 1999, subsurface soil and groundwater samples were collected from the school property [2]. No surface soil samples were collected during this sampling event because the school is located up gradient from the apartment complex and surface water runoff would not be expected to impact the school property. The subsurface soil samples were collected from 11 locations that are likely to be disturbed during the proposed renovation and new construction activities at the school (Attachment 1 - Sampling Locations at the Brookside School). The subsurface soil samples were collected from depths of two, three, and twelve feet.

Three temporary groundwater monitoring wells (TMW 1-3) were installed along the common property boundaries between the adjacent apartment complex and the school. Groundwater samples were collected from each of these wells. No investigations have been conducted to determine the direction of the groundwater flow in the area.

The subsurface soil and groundwater samples were analyzed for organochlorine pesticides (EPA Method 8081) [2]. No organochlorine pesticides were detected in the subsurface soil or groundwater samples.

Discussion

The subsurface soil and groundwater samples collected on January 22 & 24 1999, at the Brookside School site did not show detectable levels of organochlorine pesticides.

Low levels of organochlorine pesticides (maximum concentration detected: 17 ppm chlordane, 0.056 ppm heptachlor, and 1 ppm dieldrin) were detected in the surface soil samples collected on September 10, 1998, at the apartment complex and at the school property.

Populations potentially exposed to the organochlorine pesticides at the apartment complex and at the school would include children and adults. ATSDR has derived acute and chronic minimum risk levels (MRLs) for chlordane and dieldrin [7,8]. An MRL is defined as an estimate of daily human exposure to a dose of a chemical that is likely to be without an appreciable risk of adverse noncancerous effects over a specified duration of exposure. The U.S. Environmental Protection Agency (EPA) has also derived health based reference doses (RfD) for organochlorine pesticides

that were used along with ATSDR's MRLs to compare the estimated exposure doses calculated from the maximum levels of organochlorine pesticides detected in the soils at the apartment complex and the school. Table 2 shows ATSDR's MRL and EPA's RfDs and the maximum levels of organochlorine pesticides detected at the apartment complex and at the school (soil sampling data from September 15, 1998). The exposure dose equation and parameter assumptions used for soil assessment followed that found in EPA Risk Assessment Guidance for Superfund [10]. The organochlorine pesticide soil concentrations were evaluated using averaged daily doses estimated for both child and adult in residential exposure scenarios and both cancer and non-cancer dose response relationships for the organochlorine pesticides present. The estimated exposure doses calculated for children and adults did not exceed ATSDR's MRL or EPA's RfD.

Table 2: ATSDR's MRLs and EPA's RfD for the following organochlorine pesticides and the estimated exposure dose for a child using the maximum concentrations of organochlorine pesticides present in soil samples collected from the apartment complex and school properties.

<i>Pesticide</i>	<i>Acute Oral MRL (mg/kg/day)*</i>	<i>Chronic Oral MRL (mg/kg/day)</i>	<i>Chronic Oral RfD (mg/kg/day)</i>	<i>Estimated exposure dose*** (mg/kg/day)</i>
Chlordane	0.001	0.0006		0.00034
Dieldrin	0.00007	0.00005		0.00002
Heptachlor	NA**	NA	0.0005	0.000001

* mg/kg/day = milligrams per kilograms per day; **NA = not available; ***parameters for estimated dose = 10 kg weight for a child, 200 mg ingestion rate, and maximum concentrations of pesticides present (chlordane = 17 ppm, dieldrin = 1 ppm, and heptachlor = 0.056 ppm).

Chlordane, Dieldrin, & Heptachlor

Since 1988, chlordane has been banned for use as an insecticide. Chlordane was used primarily to treat termites. Chlordane applied to soils may persist for long periods of time; under field conditions, the mean degradation rate has been observed to range from 4 to 28 percent per year with a mean half-life of 3.3 years [7,11]. Chlordane is expected to be generally immobile or only slightly mobile in soil based on field tests, soil column leaching test and Koc estimation (Koc= organic carbon/water partition coefficient, the ratio of a chemical's concentration in water to that in the organic carbon phase of a soil matrix).

Dieldrin has been used extensively in the past as an insecticide for corn and for termite control, although it is no longer registered for general use [8,11]. Dieldrin applied to soils will persist for extremely long periods of time (>7 years) [11]. Its low solubility and strong adsorption to soil makes leaching to groundwater unlikely [11].

Prior to 1983, heptachlor, an insecticide, was used extensively and still persists in the environment [9,11]. Heptachlor is unlikely to leach into the groundwater since it is expected to adsorb strongly to soils [11].

ATSDR Child Health Initiative

ATSDR's Child Health Initiative recognizes that the unique vulnerabilities of infants and children demand special emphasis in communities faced with contamination of environmental media. As part of the ATSDR initiative, ATSDR health consultations must indicate whether any site-related exposures are of particular concern for children. Since children are more likely to come in frequent contact with the soil, and ingest soil at greater levels relative to body weight (due to frequent hand-to-mouth behavior), ATSDR took a conservative, protective, approach when evaluating data for this site.

Conclusions

Based on the available information and analytical data evaluated, ATSDR concluded that no public health hazard exists from organochlorine pesticides detected in the subsurface soil and groundwater samples collected at the Brookside School site. This finding is not unexpected since the organochlorine pesticides analyzed are immobile or only slightly mobile in soil making the potential for migration through the subsurface soils low. The school property is located above grade to the neighboring apartment complex property, making the potential for surface water runoff of the organochlorine pesticides unlikely.

In addition, no public health hazard exists from the levels of organochlorine pesticides detected in the surface soil samples collected from the apartment complex and the school property.

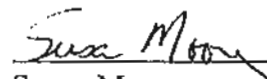
Recommendations

1. There were no recommendations made.

 7/28/99

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Concurred:


Susan Moore,
EICB Section Chief

References

1. Memorandum from the Agency for Toxic Substance and Disease Registry (Bob Safay) Region 4, requesting a public health consultation for the Brookside School Property, Sarasota, Florida, to the Agency for Toxic Substance and Disease Registry, Consultation Section Chief, Susan Moore. April 20, 1999.
2. Soil and Groundwater Sampling and Analysis for "Brookside School, 3636 South Shade Avenue, Sarasota County, Florida". Ardaman & Associates, Inc. File No. 98-8771. February 2, 1999.
3. Telephone correspondences with Wayne Beetly, School Board of Sarasota County, 7895 Fruitville Road, Sarasota, Florida. May 17, 1999.
4. Telephone correspondences with Ashby (Chip) Hoover, Ardaman & Associates, Inc., regarding the Brookside School property. May 14 & 17, 1999.
5. Topographic Survey of Brookside Middle School. Wilson & Miller, Sarasota, Florida. March 22, 1999.
6. Chemical Analysis Report, Event Name (DI): SW-DIST-1998-09-11-03, Florida Department of Environmental Protection Agency, December 2, 1998.
7. Toxicological Profile for Chlordane (Update). U.S. Department of Health and Human Services. Agency for Toxic Substances and Disease Registry, Atlanta, GA. May 1994.
8. Toxicological Profile for Aldrin/Dieldrin. U.S. Department of Health and Human Services. Agency for Toxic Substances and Disease Registry, Atlanta, GA. April 1993.
9. Toxicological Profile for Heptachlor. U.S. Department of Health and Human Services. Agency for Toxic Substances and Disease Registry, Atlanta, GA. April 1993.
10. U.S. Environmental Protection Agency's Risk Assessment Guidance for Superfund (RAGS), Human Health Evaluation Manual (Part A). EPA/540/1-89/002. December 1989.
11. TOMES CPS System. Hazardous Substance Data Base. Chlordane, Dieldrin, and Heptachlor. Micromedex. Copyright 1974-1998.

Attachment 1

**Sampling Locations at the Brookside School
Sarasota, Florida**

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