

Health Consultation No. 2

Evaluation of Indoor Air Sampling at Old Mill School

(FORMER) WHITE SWAN LAUNDRY AND CLEANER, INCORPORATED
(a/k/a MAGNOLIA AVENUE GROUND WATER CONTAMINATION SITE)

SEA GIRT, MONMOUTH COUNTY, NEW JERSEY

EPA FACILITY ID: NJSFN0204241

JULY 31, 2002

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

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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Prepared by:

**New Jersey Department of Health and Senior Services
Hazardous Site Health Evaluation Program
Consumer and Environmental Health Services
Division of Epidemiology, Environmental, and Occupational Health
Under a Cooperative Agreement with the
Agency of Toxic Substances and Disease Registry**

Abbreviations

ATSDR	Agency for Toxic Substances and Disease Registry
CREG	Cancer Risk Evaluation Guide
EMEG	Environmental Media Evaluation Guide
EPA	United States Environmental Protection Agency
HCV	Health-based Comparison Value
MCHD	Monmouth County Health Department
ND	Not Detected
NJDEP	New Jersey Department of Environmental Protection
NJDHSS	New Jersey Department of Health and Senior Services
PCE	Perchloroethylene (tetrachloroethylene)
RfC	Reference Concentration
RMEG	Reference Dose Evaluation Guide
TCE	Trichloroethylene
VOC	Volatile Organic Chemical

Summary

This Health Consultation has been prepared in response to a request that was submitted to the Agency for Toxic Substances and Disease Registry (ATSDR) by the U.S. Environmental Protection Agency (EPA) Region II and officials of the Old Mill School in April 2002. Concern has been raised by local residents and school officials about possible exposure by inhalation to chemicals that have been found in the groundwater in the vicinity of the (former) White Swan Laundry and Cleaner, Inc. (also known as the Magnolia Avenue Groundwater Contamination) site, located in Wall Township, Monmouth County, New Jersey.

It is known that a shallow ground water plume containing trichloroethylene (TCE) and tetrachloroethylene (perchloroethylene) (PCE) extends in an easterly direction from sources located in Wall Township. Moreover, the potential exists for exposure to these contaminants via inhalation of vapors that may have been transported from the groundwater into soil gas and then subsequently into the indoor air of residences and other structures. Soil gas measurements are also being performed by EPA to determine the contribution of site-related contaminants, and other contaminants like benzene, that have may been found in soils to the concentrations of chemicals that have been detected in residential air samples.

The results of the sampling show that low concentrations, *i.e.*, below ATSDR health-based comparison values (HCV) and EPA Region III Risk-Based Concentrations (RBC), of dichlorodifluoromethane, methylene chloride, and toluene are present in the indoor air of the Old Mill School. These species are commonly found in the indoor air of urban/suburban areas and are probably not related to the ground water contamination that has been identified in the vicinity of the school. Since the concentrations of these chemicals are below their respective HCV or RBC, it is unlikely that inhalation of these concentrations of the contaminants would pose a risk to the public health. The potentially site-related chemicals, *i.e.*, PCE and TCE, were not detected in any of the samples.

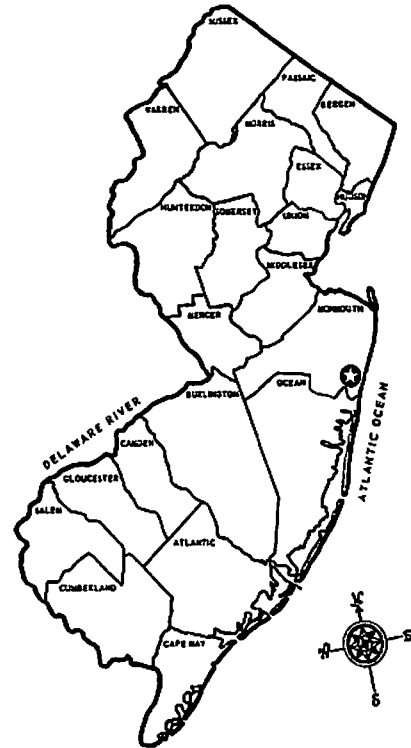
Chloromethane, another chemical that is commonly found in indoor air, was detected below its HCV, but slightly above its RBC. The RBC for chloromethane was based on limited data (one study of carcinogenicity in animals), so there is uncertainty as to whether chloromethane is a human carcinogen. Even if it is assumed that chloromethane is a carcinogen, the levels that were detected in the school are very similar to the RBC, and therefore the risk of an adverse health effect is slight.

The results of the sampling of the indoor air in the Old Mill School show that it is not likely that any exposure has occurred that would result in adverse health effects. There is no evidence that any of the potential human exposure pathways have been completed at levels of public health significance, *i.e.*, a public health hazard category of **"No Apparent Public Health Hazard"**.

Purpose and Statement of Issues

The U.S. Environmental Protection Agency (EPA) Region II requested that the Agency for Toxic Substances and Disease Registry (ATSDR) assist in evaluating the public health implications of exposure to benzene that was detected during indoor air sampling of approximately 220 residences in Wall Township, Monmouth County, New Jersey (see inset). The sampling of indoor air was conducted during the period December 2001 - February 2002, in conjunction with the on-going investigation of releases of hazardous substances from the (former) White Swan Laundry and Cleaner site, and from other nearby sources of ground water contaminants. Concern has been also expressed by local officials regarding the potential for exposure, by inhalation, to tetrachloroethylene (PCE) and trichloroethylene (TCE), which have been found to be present in the near-by shallow groundwater and could potentially volatilize into occupied structures.

On January 19, 2002, sampling was conducted at the Old Mill School, located north of the White Swan site, to determine if contaminants in shallow ground water had been transported and volatilized inside the school. At the request of local school officials and the EPA, the New Jersey Department of Health and Senior Services (NJDHSS), working jointly under a cooperative agreement with the Superfund Site Assessment Branch, Division of Health Assessment and Consultation, ATSDR, has reviewed and evaluated the results of indoor air sampling that was recently conducted at the school. The discussion that follows contains an evaluation of the results that were obtained.



Background

Site History

In 1997, the Monmouth County Health Department (MCHD) became aware of the contamination of irrigation wells in the vicinity of Magnolia Avenue in Wall Township, Monmouth County, New Jersey by tetrachloroethylene (PCE). During 1999 and 2000, the MCHD and the New Jersey Department of Environmental Protection (NJDEP) performed a joint study of shallow ground water that identified a plume of PCE and trichloroethylene (TCE) contamination about 2.5 miles long and one mile wide. The contamination plume was found to extend from Wall Township to the east into the Borough of Sea Girt (NJDEP, 2001).

During the period 1998 to 2000, NJDEP conducted site investigations at three facilities that had been identified as potential sources of the ground water contamination. Soil and ground water samples collected at the three sites confirmed that a release of volatile organic compounds (VOCs) had occurred at each of the sites. The three sources that NJDEP determined to have contributed to the Magnolia Avenue ground water contamination site are: (1) the former White Swan Laundry and Cleaner (aka Fleet Bank or Summit Bank) property, located on Sea Girt Avenue; (2) the Gulf Service Station, located at the intersection of Sea Girt Avenue and State Highway 35; and (3) Sun Cleaners, located on State Highway 35, south of Sea Girt Avenue (NJDEP, 2001).

On February 23, 2001, Fleet Bank, the owner of the (former) White Swan Laundry and Cleaner property, entered into a memorandum of agreement with the NJDEP to conduct a site investigation and remedial investigation at the site; high levels of PCE contamination were found in the shallow groundwater beneath the property. Ground water was also sampled at three educational facilities in the vicinity of the site, *i.e.*, Sea Girt Elementary School, Old Mill School, and Brookside School. Based on these results, NJDEP determined that the plume of ground water contamination may have adversely effected the indoor air quality of nearby residential properties (NJDEP, 2001).

On October 25, 2001, NJDEP conducted indoor air quality testing of three residential properties and one commercial property located near the Fleet Bank property. Based on these results, NJDEP provided the residents, and the owners of the commercial property, with fans for ventilating the basements of each of the buildings where PCE was detected.

At the request of the NJDEP, EPA announced plans on December 5, 2001, to take over the site investigation in order to further characterize the contaminated ground water that underlies portions of Wall Township and the Borough of Sea Girt, and to determine if groundwater contaminants had volatilized in the indoor air of nearby structures. EPA also announced that they would evaluate the site for potential listing on the National Priorities List (NPL), *i.e.*, Superfund. Since that time, EPA has collected and analyzed about 300 indoor air samples from approximately 220 residential and business locations (EPA, 2002).

EPA has installed ventilation systems at all homes with PCE concentrations that are considered a health risk, *i.e.*, greater than $60\mu\text{g}/\text{m}^3$ (micrograms per meter cubed), and NJDEP is assisting the homeowners whose residences were found to have elevated PCE concentrations, *i.e.*, between $6\mu\text{g}/\text{m}^3$ and $60\mu\text{g}/\text{m}^3$, and are interested in undertaking remedial measures. [Note: A companion Health Consultation to this document specifically addresses residential exposure to PCE (ATSDR, 2002).] In April 2002, EPA reported the results of indoor air sampling of the approximately 220 residences to individual homeowners (EPA, 2002). Included with this letter was a summary, provided by ATSDR and NJDHSS, of the public health consequences of exposure to airborne PCE and benzene.

Summary of Previous ATSDR Activities

In October 1999, at the request of the MCHD and the EPA, ATSDR was asked to review the information that was then available regarding the ground water contamination, and to advise the community about the usage of the irrigation wells. ATSDR determined that the PCE that had been found in the ground water that was pumped by irrigation wells posed no risk to human health, providing the water was used for non-potable purposes only. It was recommended that the extent of the plume be further characterized, and that the Sea Girt Municipal Well Field be monitored monthly for PCE (ATSDR, 1999).

Community Concerns

Residents in the vicinity of the White Swan/Magnolia Avenue Ground Water Contamination site have expressed concern about their potential exposure to PCE and TCE for several years, since it became known that these contaminants had been found in the Sea Girt municipal water system supply wells. More recently, officials at two schools, the Old Mill School and the Brookside School, requested that the indoor air in their schools be sampled and analyzed.

Discussion

Indoor Air Sampling at the Old Mill School

Four samples of the indoor air at the Old Mill School were taken on January 19, 2002. The results of the sample analyses, shown in Table 1, indicate that low levels, *i.e.*, below ATSDR HCVs and EPA RBCs, of dichlorodifluoromethane (aka Freon 12™), methylene chloride, and toluene were present in each of the samples that were taken in the school. Hexane (n-hexane) was also identified in one of the samples at a concentration below its HCV. The samples were analyzed for an additional 50 volatile organic compounds (VOCs), but no others were detected. No benzene, TCE, or PCE were found in any of the air samples. The only chemical found above its RBC was chloromethane.

Health Assessment Methodology

In the course of creating a health assessment or consultation, ATSDR evaluates the environmental and human components that lead to human exposure from releases of hazardous substances from a given site. An exposure pathway includes five elements: (1) a source of contamination; (2) transport through an environmental medium; (3) a point of human exposure; (4) a route of human exposure; and (5) a receptor population. ATSDR categorizes exposure pathways in three groups: (1) "completed pathways", that is, those in which exposure is reasonably expected to have occurred, to be occurring, or to occur in the future; (2) "potential pathways", that is, those in which exposure might have occurred, may be occurring, or may yet occur, and (3) "eliminated

pathways", that is, those that can be eliminated from further analysis because at least one of the five elements listed above is missing and will never be present, or in which no contaminant of concern can be identified.

After the pathways are designated as completed, potential, or eliminated, ATSDR follows a two-step process to comment on public health issues that are related to exposure pathways at hazardous waste sites. First, ATSDR obtains representative environmental monitoring data for the site of concern, and compiles a list of site-related contaminants. This list of contaminants is compared to health-based comparison values (HCV) to identify those contaminants that do not have a realistic possibility of causing adverse health effects. [Appendix A contains a description of terms and definitions that pertain to HCV.] Second, for the remaining contaminants, ATSDR evaluates site-specific conditions to determine what exposure scenario is realistic for a given exposure pathway. For this assumed exposure scenario, ATSDR determines a dose and compares this dose to scientific studies to determine whether the extent of exposure indicates a potential public health hazard. The health-based comparison values that are presented in this report are concentrations of contaminants that the current public health literature suggest are "safe" or "harmless". These comparison values are conservative because they include safety factors that are intended to protect the most sensitive populations. ATSDR typically uses HCVs as follows: if a contaminant is never found at levels greater than its comparison value, exposure to the contamination is considered to be "safe" or "harmless". If, conversely, a contaminant is found at a concentrations that are greater than its HCV, ATSDR designates the pollutant as a contaminant of concern and examines it further in the assessment. Because HCVs are based on conservative assumptions, the presence of a contaminant at concentrations greater than an HCV does not necessarily suggest that adverse health effects will occur within the exposed population.

Analysis of Exposure Pathways and Contaminants of Concern

The exposure pathway of concern evaluated in this Health Consultation is exposure to ground water contaminants that partition between the ground water and soils, and then volatilize and infiltrate the indoor air of the school. It has been assumed that the ground water has been contaminated, that any contaminants have been partitioned to soils beneath structures, and that the contaminants may have infiltrated these structures, for example, through cracks in the foundation.

Studies that have been conducted by the EPA have shown that measurable levels of volatile organic chemicals (VOCs) are present in the indoor air of most homes in the U.S. (EPA, 1987). Although it is well known that outdoor air contains many VOCs, the EPA studies found that the concentrations of organic chemicals in indoor air are usually higher than concentrations that are found in outdoor air. These higher indoor air levels of VOCs presumably come from consumer products that are brought into the homes, from evaporation of home construction materials, and from personal activities. EPA studies showed that certain human activities were associated with having increased levels of chemicals in indoor air. Examples of these activities are:

- * smoking indoors increases benzene, xylene, ethyl benzene, and styrene levels in indoor air;
- * bringing dry cleaning home increases the levels of PCE in indoor air;
- * using hot water in the home increases chloroform levels in indoor air; and
- * using room air fresheners, toilet bowl deodorizers, and moth crystals leads to higher levels of para-dichlorobenzene in indoor air (EPA, 1987)

For this investigation, soil gas measurements are also being performed by EPA to determine the contribution of site-related contaminants (including benzene) that have been found in soils to the concentrations of chemicals that have been detected in residential air samples.

Public Health Implications

Chloromethane (aka methyl chloride) is a colorless gas that has a faint, sweet odor. It is used as a solvent and as a degreaser. It is also used as a refrigerant, and as a propellant in the production of polystyrene foam, *i.e.*, Styrofoam™. Dichlorodifluoromethane (aka Freon 12™) is a nonflammable colorless gas that is used as a refrigerant, as an aerosol propellant, and as a foaming agent. Inhalation of dichlorodifluoromethane can cause dizziness and tremors. Methylene chloride (aka dichloromethane) is a nonflammable colorless liquid with a pleasant aromatic odor that is used as a solvent for organic compounds and as a degreaser. It is frequently found in paint remover and other consumer products, including many pesticide formulations. Toluene is a clear, colorless liquid with a sweet pungent odor. It is commonly used as a solvent and is a significant component of gasoline and other fuels.

Since chloromethane, methylene chloride, and toluene are solvents that are commonly found in consumer products, it is likely that these species were introduced to the school through routine cleaning or other activities. Dichlorodifluoromethane has likely been introduced to the school through the use of the heating, ventilation, and air conditioning (HVAC) system. Since the measured concentrations of these contaminants, except chloromethane, are below ATSDR's HCVs and EPA's RBCs (see Table 1), inhalation of these levels in the air is not expected to result in adverse health effects. Chloromethane was detected at levels slightly above its RBC, but below ATSDR's HCV. The RBC for chloromethane was based on a single study of carcinogenicity in animals. However, the EPA has since determined that current data are insufficient to characterize its human carcinogenicity (EPA, 2001). Even if it is assumed that chloromethane is a human carcinogen, the concentrations that were detected in the school are very similar to EPA's RBC, and therefore represent little or no risk of an adverse health effect.

Conclusions

The results that are presented in Table 1 show that low concentrations of chloromethane, dichlorodifluoromethane, methylene chloride, and toluene are present in the indoor air of the Old Mill School. The concentrations of these contaminants are below ATSDR health-based comparison

values (HCVs). Chloromethane was detected at levels slightly above EPA Region III's Risk-Based Concentration (RBC), but not above ATSDR's HCV. The RBC for chloromethane was based on a single study of carcinogenicity in animals, so the human carcinogenicity of chloromethane remains in question. However, even if it is assumed that chloromethane is a human carcinogen, the concentrations that were detected in the school are very similar to the RBC, so the risk of an adverse cancer health effect is little to none. No known site-related chemicals, *i.e.*, PCE, TCE, and potentially benzene, were found in the indoor air of the Old Mill school. For the above reasons, inhalation of the indoor air in the Old Mill School is not likely to have an adverse effect on human health, *i.e.*, there is **"No Apparent Public Health Hazard."** [Definitions of the public health hazard categories are given in Appendix B.]

Recommendations

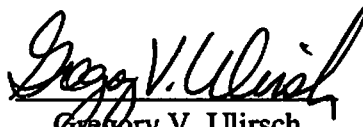
Recommendations to Cease/Reduce Exposure

As with any school or office building, well known methods of maintaining good indoor air quality should be followed, *e.g.*, adequate ventilation should be provided through proper operation of the HVAC system, particularly after using cleaning chemicals, or after a pesticide treatment. The HVAC system in the school should be operated to allow an adequate supply of outside air. Concentrations of carbon dioxide should not be allowed to exceed 1000 parts per million by volume (ppmv) in the indoor air.

If it is determined that ground water beneath the school is contaminated with site-related chemicals, it is recommended that the air in the school be periodically monitored for VOCs.

Certification

This Health Consultation was prepared by the New Jersey Department of Health and Senior Services (NJDHSS) under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It has been produced in accordance with approved methodology and procedures existing at the time the Health Consultation was begun.



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The Division of Health Assessment and Consultation, ATSDR, has reviewed this Health Consultation and concurs with its findings.



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References

ATSDR, 1999. *Public Health Consultation, Magnolia Lane [sic Avenue] PCE*, Agency for Toxic Substances and Disease Registry, October 1, 1999.

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NJDEP, 2001. Letter from Robert R. Van Fossen, New Jersey Department of Environmental Protection to Richard Caspe, U.S. Environmental Protection Agency Region II. Re: Removal Request – Magnolia Avenue Ground Water Contamination, Wall Township, Monmouth County, New Jersey, December 4, 2001.

Appendices

Appendix A: Description of Comparison Values

Description of Comparison Values

ATSDR's Comparison Values are media-specific concentrations that are considered to be "safe" under default conditions of exposure. They are used as screening values in the preliminary identification of site-specific chemical substances that the health assessor has selected for further evaluation of potential health effects.

Generally, a chemical is selected for evaluation because its maximum concentration in air, water, or soil at the site exceeds one of ATSDR's Comparison Values. However, it cannot be emphasized strongly enough that Comparison Values are not thresholds of toxicity. While concentrations at or below the relevant comparison value may reasonably be considered safe, it does not automatically follow that any environmental concentration that exceeds a Comparison Value would be expected to produce adverse health effects. Indeed, the whole purpose behind highly conservative, health-based standards and guidelines is to enable health professionals to recognize and resolve potential public health problems before they become actual health hazards. The probability that adverse health outcomes will actually occur as a result of exposure to environmental contaminants depends on site-specific conditions and individual lifestyle and genetic factors that affect the route, magnitude, and duration of actual exposure, and not solely on environmental concentrations.

Screening values based on non-cancer effects are generally based on the level at which no health adverse health effects (or the lowest level associated with health effects) found in animal or (less often) human studies, and include a cumulative margin of safety (variously called safety factors, uncertainty factors, and modifying factors) that typically range from 10-fold to 1,000-fold or more. By contrast, cancer-based screening values are usually derived by linear extrapolation with statistical models from animal data obtained at high exposure doses, because human cancer incidence data for very low levels of exposure are rarely available. Cancer risk estimates are intended to represent the upper limit of risk, based on the available data.

Listed and described below are the types of comparison values that the ATSDR and the NJDHSS used in this Health Consultation:

Cancer Risk Evaluation Guides (CREGs) are estimated concentrations of contaminants in an environmental medium (such as drinking water) that are expected to cause no more than one excess cancer case for every million persons who are continuously exposed to the concentration for an entire lifetime (equaling a risk of 1×10^{-6}). These concentrations are calculated from the EPA's cancer slope factors, which indicate the relative potency of carcinogenic chemicals. Only chemicals that are known or suspected of being carcinogenic have CREG Comparison values.

Environmental Media Evaluation Guides (EMEGs) and Reference Dose Media Evaluation Guides (RMEGs) are estimates of chemical concentrations in an environmental medium (such as drinking water) that are not likely to cause an appreciable risk of deleterious, non-cancer health effects, for fixed durations of exposure. These guides may be developed for special sub-populations such as children. EMEGs are based on ATSDR's Minimal Risk Level (MRL), while RMEGs are based on the EPA's Reference Dose (RfD).

Other health-based guides may also be used as Comparison Values, including drinking water Maximum Contaminant Levels (MCLs) established by the EPA or the NJDEP.

Appendix B: ATSDR Public Health Hazard Categories

ATSDR's Interim Public Health Hazard Categories

Category / Definition	Data Sufficiency	Criteria
<p>A. Urgent Public Health Hazard</p> <p>This category is used for sites where short-term exposures (< 1 yr) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.</p>	<p>This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.</p>	<p>Evaluation of available relevant information* indicates that site-specific conditions or likely exposures have had, are having, or are likely to have in the future, an adverse impact on human health that requires immediate action or intervention. Such site-specific conditions or exposures may include the presence of serious physical or safety hazards.</p>
<p>B. Public Health Hazard</p> <p>This category is used for sites that pose a public health hazard due to the existence of long-term exposures (> 1 yr) to hazardous substance or conditions that could result in adverse health effects.</p>	<p>This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.</p>	<p>Evaluation of available relevant information* suggests that, under site-specific conditions of exposure, long-term exposures to site-specific contaminants (including radionuclides) have had, are having, or are likely to have in the future, an adverse impact on human health that requires one or more public health interventions. Such site-specific exposures may include the presence of serious physical or safety hazards.</p>

Category / Definition	Data Sufficiency	Criteria
<p>C. Indeterminate Public Health Hazard</p> <p>This category is used for sites in which “critical” data are <i>insufficient</i> with regard to extent of exposure and/or toxicologic properties at estimated exposure levels.</p>	<p>This determination represents a professional judgement that critical data are missing and ATSDR has judged the data are insufficient to support a decision. This does not necessarily imply all data are incomplete; but that some additional data are required to support a decision.</p>	<p>The health assessor must determine, using professional judgement, the “criticality” of such data and the likelihood that the data can be obtained and will be obtained in a timely manner. Where some data are available, even limited data, the health assessor is encouraged to the extent possible to select other hazard categories and to support their decision with clear narrative that explains the limits of the data and the rationale for the decision.</p>
<p>D. No Apparent Public Health Hazard</p> <p>This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past, and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.</p>	<p>This determination represents a professional judgement based on critical data which ATSDR considers sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.</p>	<p>Evaluation of available relevant information* indicates that, under site-specific conditions of exposure, exposures to site-specific contaminants in the past, present, or future are not likely to result in any adverse impact on human health.</p>
<p>E: No Public Health Hazard</p> <p>This category is used for sites that, because of the absence of exposure, do NOT pose a public health hazard.</p>	<p>Sufficient evidence indicates that no human exposures to contaminated media have occurred, none are now occurring, and none are likely to occur in the future</p>	

* Such as environmental and demographic data; health outcome data; exposure data; community health concerns information; toxicologic, medical, and epidemiologic data; monitoring and management plans.

Table 1. Results of Indoor Air Sampling - Old Mill School, Wall Township, January 19, 2002 ($\mu\text{g}/\text{m}^3$)*

Chemical	MW	PQL	ATSDR HCV	RBC	Region III RBC	Library	Room 150	
Tetrachloroethylene (PCE)	166	3.4	272 (40ppb) UR	0.63C	ND	ND	ND	
Trichloroethylene (TCE)	130	2.69	40RfC UR	0.016C	ND	ND	ND	
Benzene	78	1.60	0.1CREG	0.22C	ND	ND	ND	
Chloromethane	50	1.03	102 (50ppb)	1.8C***	1.92	1.66	2.01	1.74
Dichlorodifluoromethane (Freon 12)	122	2.48	NONE	180	27.27	4.26	3.42	3.47
Methylene chloride	85	1.74	1043 (300ppb)	3.8C	2.40	3.45	3.00	2.96
n-Hexane	86	1.76	2110 (600 ppb) 200RfC	210	ND	ND	20.44	ND
Toluene	92	1.89	301(80ppb) 400RfC	420	4.15	1.92	1.92	ND

* report dated April 4, 2002

** $\mu\text{g}/\text{m}^3 = \text{ppbv} \times \text{MW}/24.45$ at room temperature

*** EPA IRIS indicates carcinogenicity category D (carcinogenicity not classifiable)

BOLD - exceeds EPA Region III RBC

MW - molecular weight

PQL - Practical Quantitation Level

HCV - ATSDR Health-based Comparison Value

CREG - Cancer Risk Evaluation Guide

UR - Under review

ND - Not detected

C - classified as a carcinogen by EPA Region III

RBC - EPA Region III Risk Based Concentration

RfC - EPA Reference Concentration