Health Consultation

PUBLIC HEALTH EVALUATION OF FISH CONTAMINATION DATA IN THE CONNECTICUT RIVER AND PARK RIVER CONDUIT

HARTFORD, HARTFORD COUNTY, CONNECTICUT

SEPTEMBER 25, 2006

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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HEALTH CONSULTATION

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HARTFORD, HARTFORD COUNTY, CONNECTICUT

Prepared by:

Connecticut Department of Public Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

The conclusions and recommendations in this health consultation are based on the data and information made available to the Connecticut Department of Public Health (CTDPH) and the Agency for Toxic Substances and Disease Registry (ATSDR). CTDPH and ATSDR will review additional information when received. The review of additional data could change the conclusions and recommendations listed in this document.

BACKGROUND AND STATEMENT OF ISSUE

New England's largest river, the Connecticut River, extends from Fourth Connecticut Lake in Pittsburg, New Hampshire on the Canadian Border south through the states of New Hampshire, Vermont, Massachusetts, and Connecticut and empties into Long Island Sound. The Connecticut River watershed encompasses about 11,260 square miles and the main stem of the river is 410 miles long (CRJC 2006).

Historical and ongoing pollution of the Connecticut River has had impacts on fish and wildlife population and potentially on human health. Coincident with the founding of the United States Environmental Protection Agency (USEPA) in 1970, the New Hampshire State government issued the first fish consumption advisory (fish advisory) for mercury in Connecticut River fish. As fish contaminant surveys expanded to other states in the watershed, Federal and State governments issued further fish advisories (Hellyer 2006).

The processes of agricultural abandonment, industrialization, and urbanization in New England lead to a marked impairment of the river's water quality. By the 1970s, the Connecticut River was referred to as a "landscaped sewer" (USEPA 2000). New England's rivers were among the most polluted in the nation, prior to the Clean Water Act and other pollution control legislation (Robinson et. al., 2003).

The Connecticut Department of Public Health (CTDPH) reviews new fish data collected by the Connecticut Department of Environmental Protection (CTDEP) as it becomes available and updates its advisory as appropriate. The CTDPH issued its first fish consumption advisory for the Connecticut River in the mid 1980s after sampling conducted by the CTDEP indicated that polychlorinated biphenyl (PCB) concentrations in carp and catfish fillets were elevated. The elevated PCB levels prompted CTDPH to issue a consumption advisory for catfish of "1 meal per 2 months" for people in the low risk group[1] and "do not eat" for people in the high risk group for the Connecticut River. CTDPH also issued a consumption advisory for carp of "1 meal per month" for people in the low risk group and "do not eat" for people in the high risk group in the River.

This health consultation evaluates 2003 fish tissue sampling data from the Connecticut River and the Park River Conduit (both collected in Hartford) which flows into the Connecticut River. The Park River Conduit is an underground concrete-enclosed river about a mile long, 45 feet wide, and 30 feet high. The Park River Conduit runs under the

[1] High risk group includes children under 6 years of age, pregnant women, women of child bearing age, and nursing women. Low risk group includes everyone else not included in the high risk group.

center of the Bushnell Park underneath the pump house, Pulaski Circle and Main Street, under the Hartford Public Library and the Conland-Whitehead Highway, finally arriving at the Connecticut River (Bushnell Park Foundation 2006). Previous years' sampling indicated that fish from the Park River Conduit had moderately high levels of PCBs. CTDPH requested that CTDEP perform more sampling to confirm the fish tissue levels in the Park River Conduit. CTDEP also tested PCB levels in channel catfish in the Connecticut River near the Park River Conduit in Hartford for comparison purposes.

Demographics

The Connecticut River in Hartford is a popular fishing destination in Connecticut. The population for the city of Hartford is 124, 848 (United States Census Bureau 2000). However, the Connecticut River is a popular fishing destination for people across all of Connecticut and even for people from out of state. Therefore, the demographics for Hartford do not reflect the true nature of the people fishing on the river. However, the Park River Conduit in Hartford is an underground river and is not a fishing destination except for the mouth of the Conduit.

Health Comparison Values and Fish Tissue Contaminant Levels

In 2003, 15 channel catfish from the Park River Conduit and ten from the Connecticut River in Hartford near the Park River Conduit were sampled and analyzed for PCB content as part of a resampling event by the CTDEP. All samples were submitted as discrete whole skinned fillets.

All of the fish fillets in the Park River Conduit contained PCB levels that exceeded CTDPH's Modified Great Lakes Protocol PCB value (MGLP) for fish consumption which is described below. Tissue from channel catfish in the Connecticut River in Hartford had PCB levels that were lower than those in Park River Conduit, and all but one[2] of the fish tissue samples exceeded CTDPH's MGLP value.

Sampling in 2002 indicated higher levels of PCBs in channel catfish in the Connecticut River in Hartford and in the Park River Conduit compared to the levels found in the same fish in both sampling sites in 2003. It is important to note, however, that the channel catfish samples taken in 2002 were 5-fish (skinned) composites versus the 2003 catfish samples which were individual fish samples.

1. Health Comparison Values

In order to set safe levels of PCBs in fish, CTDPH uses a modified version of the Protocol for a Uniform Great Lakes Sport fish Consumption Advisory (GLP) (1993). The GLP is a framework for setting risk-based fish consumption advisories in the Great Lakes states. Using the GLP, the Great Lakes Task Force developed a Health Protective Value (HPV) for PCBs of 0.05 µg/kg/day by using a "weight of evidence" approach which considered all of the existing toxicological values and studies (mostly human and

[2] This fish was caught in the Connecticut River in Hartford.

monkey). The “weight of evidence ” approach differs from a reference dose which typically uses a single critical study. The HPV is a unique value developed specifically for the Great Lakes sport fish advisory process. The development of the HPV was based on some key assumptions: average meal size for a 70 kg adult of one-half pound (227 grams) and a 50% reduction in PCB fish fillet content (skin on, scales off fillet) through trimming and cooking losses of fatty portions of the fish. The goal of the advisory program was to limit PCB exposure to 3.5 µg/day (0.05 µg/kg/day *70 kg = 3.5 µg/kg/day). At this exposure level, cancer risks would not be expected to exceed 1 cancer in 10,000 exposed people, and non-cancer health effects would not be likely.

Concerning non-cancer health effects, there are several animal and human studies that resulted in a variety of adverse health effects from exposure to PCBs. The main effects from exposure to PCBs in animals include hepatic, dermal, immunological, and neurobehavioral development. Because the most sensitive effects are immunological and neurobehavioral development, the GLP Task Force tended to weigh more heavily on these studies when developing its HPV (Great Lakes Sport Fish Advisory Task Force 1993).

Cancer risks associated with the HPV were evaluated using a Cancer Slope Factor (CSF) of 2 $(mg/kg/day)^{-1}$ (IRIS 1997). If a population was exposed to PCB levels of 0.05 µg/kg/day (HPV) every day for 70 years (a lifetime), there would be a theoretical excess cancer risk of 1 cancer case in a population of 10,000. This theoretical excess cancer risk is on the upper end of a generally acceptable range (1 in 10,000 to 1 in 1,000,000). The cancer slope factor of 2 $(mg/kg/day)^{-1}$ is derived from rat studies resulting in liver cancer from oral exposure to PCBs.

CTDPH’s version of the GLP takes into account detection limit issues and the somewhat greater concern for higher risk individuals (Ginsberg and Toal, 1999). CTDPH allows for unlimited consumption at PCB levels up to 0.1 ppm (parts per million), the point where practical quantification of PCBs in fish becomes certain whereas the GLP allows unlimited consumption only up to 0.05 ppm.

High risk individuals include pregnant women, women planning to become pregnant within a year, breastfeeding women, or children under the age of six. Pregnant women or women planning to become pregnant are particularly sensitive because PCBs can be passed through the mother to the unborn fetus and can result in central nervous system (CNS) effects as well as others. Children under the age of six are also particularly vulnerable because they tend to eat more per body weight. In addition, the developing organs (brain and thyroid gland) of children can sustain permanent damage if exposure to PCBs occurs during critical growth stages. Breastfeeding women are also in the high risk group because PCBs can pass through breast milk and expose young children to PCBs. Low risk individuals include the remaining population. Table 1 gives the details of CTDPH’s fish consumption advisory as it relates to PCB levels in fish samples.

Regarding the issue of higher risk individuals, the animal toxicology studies support an HPV that is in the same range for reproductive and other (immunological, dermal)

endpoints. This suggests that in utero development is no more sensitive to PCBs than are endpoints seen in adult animals. However, the evidence of low dose effects in humans is strongest for in utero effects (central nervous system development). This creates a somewhat greater concern for pregnant women and women planning pregnancy. Additionally, while the cumulative PCB dose from long-term exposure may be the most critical determinant for immunological or dermal effects, the period of exposure needed for in utero effects is uncertain. Monkeys exposed to low doses of PCBs during pre-pregnancy over several years resulted in adverse health effects among offspring. Therefore, it is uncertain whether the accumulation of maternal PCB body burden prior to and during pregnancy is critical or a relatively short exposure period (during pregnancy) could also produce low dose developmental effects (Ginsberg and Toal 1999). Two short term studies in mink and rats also resulted in low dose developmental effects from exposure to PCBs. Therefore, CTDPH believes that there may be a greater sensitivity during in utero exposure such that recent exposures that do not involve a cumulative body burden (which is important to adult toxicity) could produce an adverse health effect. This uncertainty over PCB pharmacokinetics and developmental outcomes supports a prudent avoidance (do not eat) approach for pregnant women for markedly elevated PCB concentrations (e.g. over 1 ppm). CTDPH's recommendation of "do not eat" for high risk groups for PCB levels in fish of 1.1-1.9 ppm differs from the GLP's approach which recommends a "1 meal per 2 months" restriction for fish consumption for all risk groups for PCB levels of 1.1-1.9 ppm (Ginsberg and Toal 1999). In addition, CTDPH's recommendation also differs from the GLP approach which recommends a "one meal per week" restriction for all risk groups for PCB levels of 0.10-0.20 ppm (Table 1).

When using the HPV, setting limits based on cancer risk less than 1 in 10,000 would lead to virtually no fish consumption (local or commercial) due to the widespread occurrence of low levels of PCBs in fish. This would result in the benefit of fish consumption to be lost in the interests of minimizing cancer risks. Given that the number of frequent consumers of locally caught fish in Connecticut may not be large, the theoretical 1 in 10,000 cancer risk is of less concern than if this were a population-wide exposure (Ginsberg and Toal 1999). Therefore, CTDPH and The Great Lakes Protocol focus on prevention of non-cancer health effects of PCBs.

Table 1. CTDPH's Modified Great Lakes Protocol for Fish Consumption[^]

Average PCB Level (ppm[*])	**Consumption Advisory**	
	Low Risk[#]	**High Risk[@]**
< 0.1	Unlimited Consumption	Unlimited Consumption
0.1-0.2	One meal per week	One meal per month
0.21 - 1.0	One meal per month	One meal per month
1.1 - 1.9	One meal every 2 months	Do not eat
> 1.9	Do not eat	Do not eat

[^](Ginsberg and Toal, 1999)

*Parts Per Million

[#] Includes pregnant women, women planning to become pregnant within a year, nursing women, and children under 6 years old

[@]Includes all other groups not included in the low risk group

2. Fish Contaminant Levels

Average PCB concentrations in the channel catfish fillet samples from the Park River Conduit and the Connecticut River in Hartford were above the concentration limit for unlimited consumption (0.1 ppm). Average PCB levels in channel catfish tissue tended to be lower in the Connecticut River than the Park River Conduit. Table 2 gives the average congener-based[3] PCB concentrations in the Park River Conduit and the Connecticut River in the 25 channel catfish sampled in 2003.

The average PCB concentration in channel catfish in the Park River Conduit was 0.59 ppm, while the average for the same fish species in the Connecticut River was about half the concentration at 0.35 ppm.

Table 2. PCB Concentrations in Channel Catfish Tissue Caught in the Park River Conduit and the Connecticut River, Hartford in 2003.

Location	**Species**	**Number of Samples**	**Number of Individual Fish per Sample**	**Average Concentration (Congener Based*) PCBs (ppm^)**	**Range (Congener Based) PCB (ppm)**
Park River Conduit	Channel Catfish	15	1	0.59	0.16-1.25
Connecticut River-Hartford	Channel Catfish	10	1	0.35	0.09-1.39

*The congener-based analysis method sums the concentrations of all individual congeners (up to 121) quantitated by the analytical method.

^Parts per Million

3. Time Trends

It is also informative to evaluate trends in contaminate levels in fish tissue over time. Table 3 gives the trend over time for average PCB levels in channel catfish from the Connecticut River. The average PCB levels in channel catfish have decreased in the Connecticut River in Hartford from a high of 1.10 ppm in 2002 to a low of 0.35 in 2003. CTDPH believes that the higher levels observed in the channel catfish in 2002 are consistent with those found in the late 1980's. However, the lower PCB levels in channel catfish found the Connecticut River in 2003 may be the beginning of a trend toward lower levels found in the River in Hartford. In order to make this conclusion however, more sampling needs to be performed in upcoming years. Overall, the PCB levels in channel catfish tissue in the Connecticut River in Hartford have remained below 1 ppm except for the 2002 samples.

[3] The congener-based analysis method sums the concentrations of all individual congeners (up to 121) quantitated by the analytical method.

Since 2002 is the first year that fish tissue samples have been taken in the Park River Conduit in Hartford, the only time trends that can be evaluated are comparing 2002 versus 2003 samples. Channel catfish samples taken in 2003 are half the PCB level of the catfish sampled in 2002. It is speculated that the moderately high PCB levels in the Park River Conduit in channel catfish in 2002 was due to contaminations from a spill or other short-term event. The Park River Conduit empties into the Connecticut River and PCB levels in channel catfish in the Park River are higher than the Connecticut River in Hartford (Pizzuto 2003).

Table 3. PCB Level History along the Connecticut River-Hartford and the Park River Conduit

Location	Fish Species	Highest Average (Congener Based[#]) PCBs Before 2002 (ppm[@]) (Year)	Average (Congener Based) PCBs (ppm) from 2002[%]	Average (Congener Based) PCBs (ppm) in 2003
Park River Conduit	Channel Catfish	NPS^	1.71	0.59
Connecticut River-Hartford	Channel Catfish	0.85 (1988)	1.10	0.35

[#]The congener-based analysis method sums the concentrations of all individual congeners (up to 121) quantitated by the analytical method.

[@]parts per million

[%] It is important to note that 2002 fish tissue samples were 5 fish composites and 2003 samples were individual samples.

^Not previously sampled

4. Data Evaluation Issues

In calculating average congener-based PCB concentrations, CTDPH used average concentrations for each species and sampling location rather than 95% upper confidence limits (UCLs). A 95% UCL provides a conservative estimate of the average concentration and is unlikely to underestimate the "true" average. However, there is a tendency to sample larger fish (an intentional bias) in the Connecticut and Park Rivers Sampling Program which is the source of the data used in this health consultation This provides conservatism because larger fish tend to have higher PCB concentrations. For this reason, CT DPH decided that it was not necessary to calculate 95% UCLs. CTDPH is confident that the average PCB concentrations provides a conservative estimate of the "true" average.

DISCUSSION

Exposure Pathway Analysis

To evaluate potential exposures to the contaminated fish in the Connecticut River and the Park River Conduit, CTDPH evaluated the fish tissue data and considered how people may come into contact with contaminants in the fish. The only pathway of exposure is ingestion (eating) the fish.

Environmental data show that channel catfish sampled along the Connecticut River in Hartford and the Park River Conduit are contaminated with PCBs. Individuals who catch and eat fish in these water bodies would be exposed to PCBs in the fish fillets. In addition, their families would also be exposed to PCBs if they eat the fish.

Public Health Implications for Adults and Children

When determining the public health implications of exposure to hazardous contaminants, CTDPH considers how people might come into contact with contaminants and compares contaminant concentrations with health protective levels. When contaminant levels are below health protective values (HPVs), health impacts from exposure to those levels are unlikely. Contaminant levels exceeding HPVs do not indicate that health impacts are likely, but instead warrant further investigation. In this health consultation, CTDPH used a modified Great Lakes Protocol for fish consumption to set a HPV for PCBs in fish as described in the Environmental Contamination section of this document. As stated previously, this modified protocol is a risk-based protocol which takes into account detection limit issues and the somewhat greater concern for higher risk individuals.

1. Connecticut River

Ingestion of channel catfish in the Connecticut River in Hartford which contain elevated levels of PCBs is a completed exposure pathway and is evaluated in this health consultation. Using CTDPH's Modified Great Lakes Protocol for Fish Consumption, we classified fish species according to its appropriate consumption category. Channel catfish from the Connecticut River in Hartford contain elevated PCB levels such that adverse health effects from ingestion of these fish cannot be ruled out. Individuals who do not follow the consumption advisory may be exposed to elevated PCB levels in channel catfish which may result in adverse health effects. However, if community members adhere to the current consumption advisory, there will be no significant exposure to PCBs in fish and no public health risks. CTDPH believes that the current consumption advisory is necessary to protect public health while allowing community members to benefit from the nutritional advantages of eating fish.

Environmental data indicate the average PCB levels in channel catfish in the Connecticut River in Hartford are above the concentration limit for unlimited consumption according to CTDPH's modified Great Lakes Protocol for fish consumption (Table 1). The average

PCB levels in catfish in the Connecticut River in Hartford (0.35 ppm) are within the "1 meal per month-everyone " restriction level (Table 1).

There is a decreasing trend over time of PCB levels in channel catfish in the Connecticut River. Despite the decreasing trend in PCB levels, CT DPH has decided to maintain the advisory at "1 meal per month, low risk, Do not eat-high risk" for the Connecticut River for the following reasons:

1. Past fish sampling has indicated moderately high levels of PCB contamination on this river.

2. There is insufficient sampling data to conclude that there is a significant decreasing time trend in PCB levels in channel catfish in the Connecticut River. Further sampling is necessary to show that PCB levels in channel catfish are low enough to allow more consumption and to assess any trends in PCB levels.

CTDPH believes that maintaining the current consumption advisory is necessary to protect public health while allowing community members to benefit from the nutritional advantages of eating fish.

2. Park River Conduit

Ingestion of channel catfish in the Park River Conduit which contains elevated levels of PCBs is not considered a completed pathway because the River is an underground river and not considered to be a fishing destination (except for the mouth of the Conduit).

Table 4 gives the current CTDPH fish consumption advisory in response to the 2003 PCB data from the Connecticut River in Hartford and compares it to the previous advisory.

Table 4. Updated 2005 Advisory for the Connecticut River

Location	**Fish Species**	**Consumption Advisory**	
		Previous (2004)	Updated (2005)
Connecticut River	Catfish	1 Meal per Month /Do Not Eat – High Risk	No Change

EVALUATION OF COMMUNITY CONCERNS

The following is a list of general concerns that CTDPH has received in recent years through community meetings and inquiries from the public and community leaders:

1. I eat fish often in the Connecticut River. Why have I not gotten sick?

   The PCBs present in fish in the Connecticut River are not present at levels that will make you acutely (immediately) sick. They are chronic toxins (i.e. they take a long time to cause an effect). The health effects of concern for PCBs are potential cancers and developmental problems in children/fetuses. PCBs accumulate in your body over time. The more PCB contaminated fish you eat, the greater the PCB levels that will build up in your body. PCB exposure is a particular concern to pregnant women because the exposure their unborn child receives through the mother can cause developmental, behavioral, and learning problems in children.

2. I have eaten lots of fish from the Connecticut River. Is there medicine I can take to get rid of these chemicals?

   There is no medicine or other procedure to get rid of the chemicals your body has accumulated from eating fish. The chemicals will very slowly leave your body over time. If you follow the advisory you will decrease your exposure and allow your body the time needed to reduce the levels of the chemicals.

CONCLUSIONS

Channel catfish sampled from the Connecticut River in Hartford and from the Park River Conduit in 2003 were found to have elevated levels of PCBs. CTDPH uses this fish tissue data to issue a general fish consumption advisory for the Connecticut River. The sampling event in 2003 was in response to moderately high levels of PCB in channel catfish sampled in the Park River Conduit in Hartford 2002. Sampling was also performed in 2003 in the Connecticut River in Hartford for comparison purposes. The PCB levels in channel catfish in the Connecticut River in Hartford are elevated enough to warrant a continued consumption advisory. Although PCB levels in channel catfish in 2003 are lower than previous years, more sampling needs to be performed before the consumption advisory is modified. CTDPH has decided to maintain its advisory of "1 meal per month-low risk, do not eat-high risk." CTDPH has decided not to issue a consumption advisory for the Park River Conduit because it is an underground river and it is not a source of fishing (except for the mouth of the conduit).

ATSDR has a characterization scheme whereby the level of public health hazard at a site is assigned to one of five conclusion categories (Appendix A). CTDPH has concluded that channel catfish from the Connecticut River in Hartford present a public health hazard to individuals who do not follow the consumption advisory. If community members

adhere to the current consumption advisory, exposure to PCBs in fish would not be significant enough to cause adverse health effects. CTDPH believes that this continued consumption advisory is necessary to protect public health while allowing community members to benefit from the nutritional advantages of eating fish.

RECOMMENDATIONS

1. CTDPH recommends that the Connecticut Department of Environmental Protection (CTDEP) continue to work together with CTDPH on their fish sampling plan for the Connecticut River and the Park River Conduit.

2. CTDEP Fisheries should continue to work with CTDPH to educate fishing populations along the Connecticut River about the consumption advisory.

PUBLIC HEALTH ACTION PLAN

Actions Taken

1. CTDPH along with CTDEP Fisheries have worked together to educate both the general public about the consumption advisory as well as other populations along the river. CTDPH has provided signs to the Local Health Departments along the river to inform the public about the consumption advisory.

2. CTDPH printed its current fish consumption advisory in May 2004 in response to the 2003 fish sampling data in our annual brochure entitled, "If I Catch It, Can I Eat It?" The brochure has been distributed to towns and local health departments along the Connecticut River.

Actions Planned

1. CTDPH and CTDEP will continue to work together to educate the general public along the Connecticut River about the consumption advisory as well as other populations along the river.

2. CTDPH will continue to evaluate new fish contaminant data and will update its current Connecticut River fish consumption advisory as needed.

3. CTDPH will continue to review its fishing sampling protocol periodically and modify it as appropriate.

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CERTIFICATION

The Health Consultation for the Public Health Evaluation of Fish Contaminant Data in the Connecticut River and Park River Conduit in Hartford Connecticut was prepared by the Connecticut Department of Public Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It was completed in accordance with approved methodology and procedures existing at the time the health consultation was initiated. Editorial review was completed by the ATSDR 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.

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Appendix A. ATSDR Interim Public Health Categories

Category/Definition	Criteria	ATSDR Actions
1. Urgent Public Health Hazard *This category is used for sites where short-term exposures (< 1 year) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.* This determination represents a professional judgment 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.	Evaluation of available relevant information indicates that the site-specific conditions or likely exposures have had, 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.	ATSDR will expeditiously issue a health advisory that includes strong recommendations to immediately stop or reduce exposure to mitigate the health risks posed by the site.
2. Public Health Hazard **This category is used for sites that pose a public health hazard due to the existence of long-term exposures (> 1 year) to hazardous substance or conditions that could result in adverse health effects.** This determination represents a professional judgment 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.	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.	ATSDR will make recommendations to stop or reduce exposure in a timely manner to mitigate the health risks posed by the site.

Appendix C. ATSDR Interim Public Health Categories, Continued

Category/Definition	Criteria	ATSDR Actions
3. Indeterminate Public Health Hazard This category is used for sites in which "critical" data are insufficient with regard to extent of exposure and/or toxicologic properties at estimated exposure levels. This determination represents a professional judgment 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.	This category is used for sites in which "critical" data are insufficient with regard to extent of exposure and/or toxicologic properties at estimated exposure levels. 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.	ATSDR will make recommendations in the public health assessment to identify the data or information needed to adequately assess the public health risks posed by the site.
4. No Apparent Public Health Hazard 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. This determination represents a professional judgment 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.	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.	Recommendations made to reduce exposure are not needed to reduce risk but may be considered prudent public health practice.
5. No Public Health Hazard This category is used for sites that, because of the absence of exposure, do NOT pose a public health hazard.	Sufficient evidence indicates that no human exposures to contaminated media may have occurred, no exposures are currently occurring, and exposures are not likely to occur in the future.	ATSDR may make no recommendations or may recommend community health education.