

1 **VI. Community Health Concerns**

2 Responding to community health concerns is an essential part of ATSDR's overall mission and
3 commitment to public health. ATSDR actively gathers comments and other information from
4 those who live or work near the ORR. ATSDR is particularly interested in hearing from area
5 residents, civic leaders, health professionals, and community groups. ATSDR is addressing these
6 community health concerns in the ORR PHAs that are related to those concerns.

7 To improve the documentation and organization of community health concerns at the ORR,
8 ATSDR developed a *Community Health Concerns Database* specifically designed to compile
9 and track community health concerns related to the site. The database allows ATSDR to record,
10 track, and respond appropriately to all community concerns, and also to document ATSDR's
11 responses to these concerns.

12 Since 2001, ATSDR compiled more than 2,500 community health concerns obtained from the
13 ATSDR/ ORRHES community health concerns comment sheets, from written correspondence,
14 phone calls, newspapers, comments made at public meetings (ORRHES and work group
15 meetings), and surveys conducted by other agencies and organizations. These concerns were
16 organized in a consistent and uniform format and imported into the database.

17 The community health concerns addressed in this PHA are those concerns in the ATSDR
18 Community Health Concerns Database related to PCB releases from the ORR. Table 14 contains
19 the actual comments and ATSDR's responses. These concerns and responses are sorted by
20 category (concerns about PCBs, concerns about fish or turtles that could be related to their PCB
21 contamination, and PCB-related concerns about the Clinch River and East Fork Poplar Creek).

22

1

Table 14. Community Health Concerns from the Oak Ridge Reservation Community Health Concerns Database

<i>Actual Comment</i>		<i>ATSDR's Response</i>
Concerns about PCBs		
1	<p>The multiple exposure problem-There is no coefficient for this phenomenon. It is not possible to assess the toxicity of all known compounds, never mind of their combinations. The most obviously suspicious cases were exposures to PCBs and mercury, in which similar symptoms occurred elsewhere in the country. All interactions in the body have not been studied and understood, but he felt that they were not likely.</p>	<p>ATSDR could find only one such peer-reviewed study in which Oswego, New York children exposed in the womb to the highest levels of highly chlorinated PCBs were said to be more sensitive to the effect of exposures to mercury on cognitive development, although levels of mercury exposure did not affect sensitivity to PCBs (Stewart, et al. 2003). The difference in performance of the exposure groups was, however, within the internal consistency and reliability expected of the test used, and the difference seen at age 38 months was gone at age 54 months, when one of the sub tests showed better performance in the highest PCB group than in the group for which PCBs were not detected. The authors considered their results inconclusive until they could be repeated by other scientists. Although the Watts Bar Reservoir Exposure Investigation (EI) found total serum PCBs in ORR fish consumers to be higher than in unexposed people, but similar to other fish consumers nationally, ATSDR did not find the proportion of highly chlorinated PCBs to be higher in ORR sera than in that of unexposed people. So the Stewart et al. (2003) study, if its results can be replicated in the future, might not have relevance to ORR fish/biota consumers.</p> <p>The commenter is probably correct about the likelihood of harmful interactions among site-related contaminants. It is true that many medicines, intentionally prescribed at doses high enough to have an effect, will interact with other medicines. Doctors commonly ask their patients for lists of all their drugs and doses to avoid harmful interactions among the effects the different medicines can cause. But exposures to environmental pollutants are commonly at doses near their MRLs or reference doses, which are usually hundreds to thousands of times less than those observed to cause effects (ATSDR 2004, 2005; U.S. EPA 2005). Pollution levels need to be orders of magnitude higher than these standards to have any effect, or be able to cause interactions (Groten et al. 1997; Jonker et al. 1993). Hazardous sites rarely release that much pollution to the areas where people live (see our Web site http://www.atsdr.cdc.gov/). Therefore we do not usually expect toxic interactions in such environments, including residential areas near the ORR.</p>

Oak Ridge Reservation: Polychlorinated Biphenyl (PCB) Releases
Public Health Assessment (Public Comment)

<i>Actual Comment</i>	<i>ATSDR's Response</i>
<p>2 I had some questions about your study of the hundred and sixteen people in the southern Watts Bar area. I don't know if I am being premature in my questions to you, but did you all come to the conclusion that there was no danger from eating the fish for anything other than PCBs, when that was the only thing you tested for?</p> <p>A public health study takes the exposure data and health outcome data and tries to find a correlation between them. "Study" in this sense is a very specific term and should not be taken lightly. It should not be confused with "investigations" such as the one at Watts Bar.</p> <p>Concerning studies of PCBs and blood samples in people who eat fish, I wonder how valid the information would be. Do PCBs stay in the blood, for example, and were they are a lot higher, one would presume, right after eating a meal than a week later? Were those factors taken into account in the study? So finding one or two people that were in the high risk category might be pretty misleading, if indeed the study didn't really reflect how-I mean stored PCBs in people.</p> <p>If your testing was accurate and your conclusions were accurate, why hasn't something changed so far as all of those fish advisories?</p> <p>I don't think the community would mind if you had an advisory on don't eat the turtles.</p>	<p>ATSDR conducted the Watts Bar Reservoir EI in March 1998. The EI evaluated the levels of PCBs (and mercury) in people who consumed moderate to large quantities of turtles and fish from the Watts Bar Reservoir. The EI reported: (1) the participants' serum levels are slightly below national norms for total PCBs and (2) of the 116 people tested, only 5 (4%) had a serum PCB level above the level that is regarded as elevated for total PCBs, and only one participant had a serum PCB level that was above the distribution seen in the general population. In this PHA's additional extensive review of the scientific literature, ATSDR found that body burdens of ORR fish consumers are below those of people exposed occupationally, above those of nonfish consumers, and within the national norm for those who do consume sports fish (see Figure 29). Follow-up counseling was provided for participants with elevated PCB blood levels.</p> <p>PCBs are persistent organic pollutants and remain in the environment or in the body a long time. After a fish meal, blood PCB levels are elevated for 24–48 hours, until the PCBs equilibrate into the tissues. If they are ingested repeatedly, they accumulate. That is why the oldest participants in the EI had the highest body burdens. By comparing ORR body burdens to those nation wide and researching the scientific literature about effects of body burden levels, ATSDR took this age-related effect into account.</p> <p>TDEC is the state agency responsible for issuing these public health advisories. They may be seen at http://www.state.tn.us/environment/wpc/publications/advisories.pdf. ATSDR recommends that the advisories be followed as a prudent public health practice. To lower PCB exposure without decreasing consumption, ATSDR recommends that people should skin fillets, remove belly fat from fish, and cut away excess fat from turtles and geese taken near ORR. Fish and turtles should be prepared by methods that permit fat to drain away.</p> <p>Under the Tennessee Oversight Agreement, TDEC established a DOE Oversight Division office in Oak Ridge, Tennessee. This division conducts annual monitoring of chemical and radioactive substances from the ORR to assure that the levels of contaminants are not a public health concern. DOE publishes its findings in an annual report that is accessible to the public. Given these findings, TDEC may or may not issue public health advisories. Monitoring data and additional information are available from the Oak Ridge office at 761 Emory Valley Road, Oak Ridge, TN. For more information about advisories Oak Ridge advisories, call John Owsley at 865-481-0995. Visit http://www.state.tn.us/environment/doeo/ for details about this division (TDEC 2003b).</p> <p>This PHA found that at the consumption levels reported in the EI, eating turtle meat does not expose people to levels of PCBs sufficient to cause illness. People should not, however, eat the turtle fat.</p>

<i>Actual Comment</i>		<i>ATSDR's Response</i>
3	<p>Uranium, mercury, iodine, and PCBs have been detected in Scarboro.</p> <p>There are 6 initial contaminants of concern (which include iodine-131, mercury, uranium, radionuclides in White Oak Creek, polychlorinated biphenyls, fluorine/fluoride), although there may be others.</p>	<p>ATSDR will continue to evaluate contaminants and pathways of concern to the community surrounding ORR. In addition to this evaluation of PCBs from ORR, ATSDR has released a PHA on uranium from the Y 12 plant and is evaluating uranium from the K-25 facility, iodine-131, mercury, White Oak Creek releases in the 1950s, fluorides, the TSCA incinerator, and groundwater. ATSDR will also screen data from 1990 to the present to determine whether additional contaminants of concern need to be addressed.</p> <p>In 1998, Florida Agriculture and Mechanical University (FAMU) collected soil and sediment from Scarboro and analyzed 10 percent of the samples for 150 organic and inorganic chemicals (FAMU 1998). ATSDR evaluated these data and determined that none of the chemicals that were detected (over 100 chemicals were not detected) were at concentrations that would cause harmful health effects from exposure to the soil or sediment.</p> <p>In this PHA, ATSDR found that PCBs in East Fork Poplar Creek (EFPC) sediment and associated floodplain soil near the Scarboro region (which is elevated 40 feet above EFPC) were at levels too low to affect the most sensitive residents, who are the children playing there on a daily basis (see Figure 16 and Figure 17).</p>
4	<p>There is one other very important thing in the 1990s. I believe about 1993 or 1994 is when the most concern was raised about the TSCA Incinerator and PCBs.</p>	<p>From the dose reconstruction, "Based upon the data collected, it is unlikely that oils containing high concentrations of PCBs were incinerated. Waste oils containing high concentrations of PCBs are nonflammable and would have been disposed in burial pits. In addition, the only documented wastes with high concentrations of PCBs (the cutting fluids) were disposed in the 1970s after the practice of burning waste oils had been discontinued. It is possible, however, that wastes containing lower concentrations of PCBs (up to several hundred parts per million) could have been burned at the facility, potentially resulting in PCB levels in ambient air and also causing the formation of low levels of chlorinated dioxins and furans" (ChemRisk 1999a). The authors of the dose reconstruction considered air transport a less significant source of the total PCB dose than transport via water and sediment (and fish). Direct air pathways were eliminated as sources of illness by the dose reconstruction. In this PHA, ATSDR validated and accepted pathway elimination by the dose reconstruction because the dose reconstruction used conservatively estimated and modeled environmental concentrations even when actual concentration data were lower than those modeled.</p>

Oak Ridge Reservation: Polychlorinated Biphenyl (PCB) Releases
Public Health Assessment (Public Comment)

<i>Actual Comment</i>		<i>ATSDR's Response</i>
5	<p>The dose reconstruction missed a lot of PCBs that came from the lab, and there are no records of what came from White Oak Creek.</p> <p>Two community members noted that there was a barrier at White Oak Creek, but that people still fished there. The community members continued that the barrier was simply a cable that went across with a sign that said not to enter the area. They said that people would lift this up, go under the cable, and fish at the creek.</p>	<p>The dose reconstruction said, "Although records of the last 15 years indicate that releases from [X-10] have been negligible, measurable levels of PCBs exist in White Oak Creek Embayment and White Oak Lake. This suggests that PCBs have been released from X-10 operations. It is not clear whether these observed levels have resulted from releases that occurred prior to the late 1970s or from ongoing low level releases. . . It should be noted that PCBs likely entered the Clinch River from White Oak Creek. This contribution was included in the evaluation of exposures from the consumption of Clinch River Fish" (ChemRisk 1999a).</p> <p>White Oak Creek joins the Clinch River at CRM 21. In this PHA, ATSDR reviewed Clinch River sediment PCBs by CRM, depth (year deposited), and distance from the river up to 1/4 mile along the creek. From Figure 23, ATSDR's CV protective of toddlers playing daily on creek sediment is 10 to 100 times higher than the highest PCB levels found. ATSDR's CVs include a 300-fold safety factor. White Oak Creek sediment PCBs are not high enough to cause illness.</p>
6	Has physician training on polychlorinated biphenyls and cyanide had any benefit and if the referrals were helpful.	Yes, it resulted in counseling patients about their exposures and referrals to specialists.
7	What about area contamination sources? Can ATSDR estimate the contamination resulting from ORR operations?	The Task 3 team investigated historical uses and releases of PCBs at the ORR. They also identified more than 22 additional facilities that managed PCB-containing wastes upstream from the ORR. The noted that "it is difficult...to discern what fraction of the PCBs in fish in the vicinity of the ORR may have been contributed by these other facilities" (ChemRisk 1999a). Please see Section 3.1 and 3.2 in the Task 3 report for additional details.
8	Do plants uptake PCBs?	<p>PCBs are strongly sorbed by soil organic matter and clay, which inhibits the uptake of PCBs in plants through the roots (Bacci and Gaggi 1985; Chu et al. 1999; Gan and Berthouex 1994; Paterson et al. 1990; Streck et al. 1982b; Webber et al. 1994; Ye et al. 1992a). Plant bioconcentration factors of PCBs from soil are estimated to be <0.02 for most terrestrial plant species (Cullen et al. 1996; O'Connor et al. 1990; Pal et al. 1980).</p> <p>PCBs adhere to the outer surfaces of plants, especially root crops such as carrots. To remove PCBs from such crops, especially when they are grown in contaminated soil, peel before eating.</p>
Concerns about Fish or Turtles that Could Be Related to their PCB Contamination		
9	The units are confusing and meaningless in mg/kg/day, could the expression use so many sized fish consumed per day? People in the area consume a lot of local fish and locally grown foods so there should be site-specific intake rate values.	Please see Figure 1 for ATSDR's recommended maximum number of fish meals that can safely be eaten from the waterways near the ORR. One adult meal is considered to be 8 ounces (227 grams). Children were assumed to eat one-third as much as adults.

<i>Actual Comment</i>		<i>ATSDR's Response</i>
10	<p>They fish out of the local lakes and streams and the streams are contaminated for a hundred miles.</p> <p>Having grown up along lakes and creeks, I'd like to point out that people were not limited to one area, fishing people went everywhere. Because of this, it is difficult to pinpoint one single location.</p> <p>What about the levels of PCBs in the fish?</p> <p>Since vegetables and fish are the dominant pathways, are people who live downstream at higher risk?</p>	<p>In this PHA, ATSDR evaluated levels of PCBs in fish in the local lakes and streams (all along the three arms of the WBR, including the Clinch and Tennessee Rivers), and Poplar Creek. ATSDR made the following conclusions:</p> <ul style="list-style-type: none"> • Sunfish species can safely be eaten in any amount. • All fish species can safely be eaten in low amounts from any water body near ORR. • Eating moderate to high amounts of certain species of fish (catfish, white bass, hybrid bass, and striped bass) is not recommended. ATSDR recommends that people follow the fish advisory to reduce their exposures. • People should avoid eating turtle fat. Discarding the fat, eggs, and all organs—while only saving the meat (muscle) for eating—can reduce exposure to PCB-contaminated fat and tissue. <p>Please see Figure 1 for ATSDR's recommended maximum number of fish meals that can safely be eaten from the waterways near the ORR.</p>
11	<p>Concentrations of PCB in fish of upper East Fork Poplar Creek are not decreasing.</p>	<p>ATSDR eliminated East Fork Poplar Creek fish consumption as a pathway of concern. East Fork Poplar Creek is not a very productive fishing location, and very few people actually eat fish from this creek. Most local fish are caught from the Clinch River and Watts Bar Reservoir. Further, in 1996 and 1997, 34,220 loose cubic meters of mercury-contaminated soils were removed from the floodplain near the NOAA Atmospheric Diffusion Laboratory off Illinois Avenue and across the Oak Ridge Turnpike from the Bruner's Shopping Center on the Wayne Clark Property. PCB-contaminated soils in these areas would also have been removed during this remediation.</p>
12	<p>Since the contamination from fish ingestion will not necessarily be measurable in the blood stream at high levels at all times, a challenge test is needed to detect it. This was not used by ATSDR and is not normally used in a standard physician's office visit test. The ATSDR study results are countered by other studies, and communities in the southeast whose problems were addressed by ATSDR were not helped.</p>	<p>There are medical tests that measure the level of PCBs in the body by analyzing blood, body fat, and breast milk. These are not routine tests, but they could be requested from a doctor. These tests can indicate if a person was exposed to PCBs, but they cannot determine the amount of exposure, type of PCBs, or if adverse health effects will occur. Thus, these tests do not enable physicians to provide better care for their patients (ATSDR 2000). For more information on PCBs, visit http://www.atsdr.cdc.gov/toxprofiles/phs17.html.</p>

Oak Ridge Reservation: Polychlorinated Biphenyl (PCB) Releases
Public Health Assessment (Public Comment)

Actual Comment		ATSDR's Response
13	I'm very concerned/interested in how ATSDR addresses PCBs in turtles in the final report. We sample turtles every 5 years and find PCBs significantly higher than in fish. There is no consumption advisory on turtles and this seems to be a contradiction. It must be based on a lower intake of turtle flesh per year. It would be great if ATSDR could address this head on in their PHA and state very clearly whether there is any risk from consuming turtles and if not why.	<p>The median PCB concentration detected in turtle meat (140 ppb) is about equal to the median PCB concentration detected in largemouth bass from Poplar Creek (130 ppb); that is higher than the concentrations in sunfish (22–40 ppb) and lower than the concentrations in white, striped, hybrid-bass, and in catfish species (440–1,270 ppb). The median PCB concentration detected in turtle fat (44,000 ppb) is much higher than the median PCB concentrations detected in any other biota species (see Table 11).</p> <p>In this PHA, ATSDR evaluated three turtle meat consumption levels—eating two meals of turtle per year, eating one meal of turtle per year, and eating one meal of turtle every 6 years. These consumption rates were established from the information gathered during ATSDR's exposure investigation. ATSDR's evaluation determined that eating turtle meat up to twice a year is not a public health concern.</p> <p>Because, however, the level of PCBs detected in turtle fat (44,000 ppb) is so much higher than turtle meat and all the other fish species, people should avoid eating turtle fat. Discarding the fat, eggs, and all organs—while only saving the meat (muscle) for eating—can reduce exposure to PCB-contaminated fat and tissue.</p>
14	What is the national PCB average in fish?	EPA's National Study of Chemical Residues in Fish reported an arithmetic mean of 1.89 ppm (wet weight) for total PCBs (U.S. EPA 1999a). EPA Region 5 and the Upper Mississippi River Conservation Committee compiled a database of fish tissue data collected throughout the Upper Mississippi River from 1970 through 1998 (U.S. EPA 2002b). For additional perspective on PCB levels in fish, please see their report at the following Web site: http://www.epa.gov/region5/water/umr_wq_assess.htm .
15	Do species that are higher on the food chain contain higher PCB levels?	Yes. PCBs bioaccumulate through the aquatic food chain. Species that are higher on the food chain typically contain higher PCB concentrations. See Appendix C. Examples of Various Aquatic Food Webs.
16	Is it safe to eat carp?	Due to their high lipid content, carp are a suitable species for assessing PCB contamination and would closely mirror the levels found in ORR catfish. Therefore, ATSDR recommends following the same advisory for carp as catfish (i.e., children should avoid eating more than one carp meal per month and adults should avoid eating more than one carp meal per week).
17	Is it safe to eat crappie?	Crappie are members of the sunfish family, Centrarchidae. Therefore, it is likely that some crappie were captured and reported as "sunfish spp.," which were among the species evaluated during this health assessment. The concentrations of PCBs detected in sunfish spp. were below levels of health concern. Therefore, ATSDR presumes that it is also safe to eat crappie based on the PCB levels found in sunfish.
18	What is the lifespan of catfish?	According to FishBase, Channel catfish (<i>Ictalurus punctatus</i>) can live a maximum of 16 years, flathead catfish (<i>Pylodictis olivaris</i>) can live a maximum of 20 years, and blue catfish (<i>Ictalurus furcatus</i>) can live a maximum of 21 years (www.fishbase.org).

<i>Actual Comment</i>	<i>ATSDR's Response</i>
PCB-Related Concerns about the Clinch River	
<p>19 What is the probability of a clinic for residents closely associated and who live close by incinerators and the Clinch River and East Fort Poplar Creek?</p>	<p>On August 27, 2002, ORRHES determined that discussion of public health activities related to establishment of a clinic, clinical evaluations, medical monitoring, health surveillance, health studies, or biological monitoring is premature. The ORRHES recommended postponing formal consideration of these issues until the ATSDR PHA process identifies and characterizes an exposure of an off-site population at levels of health concern.</p> <p>ATSDR scientists generally consider recommending follow-up public health activities that are service- or research-oriented (e.g., medical monitoring, health studies, health surveillance, or research) when there is a plausible, reasonable expectation of adverse health effects associated with the observed levels of exposure to contaminants. In this PHA on PCB releases, ATSDR scientists determined that people eating certain species of fish from Poplar Creek, the Clinch River, Tennessee River, and Lower Watts Bar Reservoir could be exposed to PCBs. The results of ATSDR's exposure investigation on people who ate moderate to large amounts of fish and turtles from the Watts Bar Reservoir investigation showed, however, that body burdens of Watts Bar Reservoir fish consumers are below people exposed occupationally, above nonfish consumers, and within the range for people who consume sport fish. ATSDR also calculated estimated exposure doses and found that all of the calculated doses are below levels associated with health effects. Because the estimated doses are not expected to cause health effects, analysis of health outcome data, medical monitoring, or surveillance is not appropriate. Further public health activities are not scientifically reasonable unless the level of estimated exposure is likely to result in an observable number of health effects. And because such an estimate of exposure cannot be made, the requirement to consider further public health activities on the basis of exposure is complete.</p> <p>But as a conservative measure, ATSDR determined prudent public health practice would limit consumption of <i>certain species of fish</i> from Poplar Creek, the Clinch River, Tennessee River, and Lower Watts Bar Reservoir; some of the doses approached (but did not exceed) the health effects level. Therefore, ATSDR recommends people follow the TDEC's fish consumption advisories for Poplar Creek, the Clinch River, Tennessee River, and the Lower Watts Bar Reservoir. The advisory is available at the following Web site: http://www.state.tn.us/environment/wpc/publications/advisories.pdf. ATSDR will also develop health education materials to help community members understand fish consumption advisory and ways to minimize exposure to PCBs in fish.</p>
<p>20 Are the impacts of solid waste storage areas on groundwater considered in any of the PHAs? Today's Knoxville newspaper reported on the impacts on the Clinch River and downstream reservoir of solid waste storage areas.</p>	<p>ATSDR evaluated exposures to off-site groundwater in a pathway-specific PHA. It was released final in 2006, and can be accessed at http://www.atsdr.cdc.gov/HAC/PHA/region_4.html#tennessee.</p>

Oak Ridge Reservation: Polychlorinated Biphenyl (PCB) Releases
Public Health Assessment (Public Comment)

<i>Actual Comment</i>		<i>ATSDR's Response</i>
21	There was more PCBs coming down the Tennessee River than the Clinch River.	<p>That was the result modeled by the dose reconstruction: loading to the riverbed and fish for these two rivers deposited more PCBs to the Tennessee River. It also seemed logical because the ORR would have been the primary contributor to Clinch River pollution, while multiple sources released PCBs to the Tennessee River.</p> <p>The only sediment core with detectible PCBs was, however, one taken from the Clinch River at CRM 9.5 (see Figure 16 and Figure 17). From the more than 52,000 records of biota ATSDR reviewed for this document, the median PCB levels in fish taken before 1996 from the LWBR (a part of the Tennessee River widened by the Watts Bar Dam) and the Tennessee River were about half that taken from fish in the Clinch River (see the distribution graphs in Figure 18, Figure 19, and Figure 20).</p> <p>Because of regulatory oversight, ORR began to remediate sources of PCBs as early as the 1970s, and that may have been earlier than other facilities were able to begin. From samples taken 1996 and after, Clinch River fish PCB medians were 20–25 percent of the medians from LWBR and the Tennessee River (see Figure 24, Figure 25, and Figure 26).</p>
PCB-Related Concerns about East Fork Poplar Creek (EFPC)		
22	Lower EFPC flows through the Scarboro community; so does Scarboro Creek.	<p>Scarboro is located at an elevation of about 40 feet higher than EFPC and avoided direct contact with discharges of waterborne Y-12 contaminants (such as the PCBs carried by EFPC sediment).</p> <p>In 1998, FAMU collected soil and sediment from Scarboro and analyzed 10 percent of the samples for 150 organic and inorganic chemicals (FAMU 1998). ATSDR evaluated these data and determined that none of the chemicals that were detected (over 100 chemicals were not detected) were at concentrations that would cause harmful health effects from exposure to the soil or sediment.</p>
23	East Fork Poplar creek has been identified by TDEC as the most contaminated creek in Tennessee according to the Oak Ridger newspaper.	In this PHA, ATSDR mapped PCB contamination in the sediment under EFPC and the floodplain alongside (Figure 17) and graphically showed that PCB contamination of EFPC sediment and associated floodplain soil is all below CVs (Figure 16). Thus, for PCBs the EFPC is not the most contaminated creek in Tennessee.