Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

April 9 1997

Mr. Randy Gordon, Chair
Oak Ridge Reservation Environmental
Management Site Specific Advisory Board
3602 River Road
Ten Mile, Tennessee 37880

Dear Mr. Gordon:

RESPONSE TO COMMENTS ON CLINCH RIVER RECORD OF DECISION

This letter is in response to the comments of the Oak Ridge Reservation Environmental Management Site Specific Advisory Board (ORREMSSAB) on the Clinch River/Poplar Creek Proposed Plan.

The ORREMSSAB's comments are addressed both individually and in conjunction with similar other comments received and are enclosed. If you have any questions, please give me a call at 576-0742.

Sincerely,

Rodney R. Nelson
Assistant Manager for
Environmental Management

Enclosure

Comment: The Oak Ridge Reservation Environmental Management Site Specific Advisory Board (ORREMSSAB) also questions whether the fish consumption advisory program actually prevents people from eating contaminated fish. They recommend a program be implemented to determine the effectiveness of the advisory program, and they would like more detailed advisories that indicate the amount of fish consumption that is considered unsafe as well as appropriate methods for cleaning and preparing fish for consumption.

Response: The TDEC Division of Water Pollution Control issues fish consumption advisories to fulfill the requirements of state law and to keep the public informed of potential health hazards. Two types of advisories are used: No Consumption advisories warn people not to eat any amount of the listed species, while a Precautionary Advisory suggests that no more than 0.5 kg (1.2 lb)/month of the listed species be consumed. The advisories are determined based on actual concentrations of contaminants (like PCBs) in fish tissue compared to the U.S. Food and Drug Administration guidelines or using EPA risk assessment methodology. The risk assessment prepared for the CR/PC OU in the RI was performed using EPA methodology. The EPA method uses a consumption rate of 54 g (1.9 oz) of fish tissue per day as a conservative estimate of the amount of fish a local resident might eat throughout his/her life span. The risk assessment determined that there is a risk to the public if a resident eats that amount of fish for 30 years; however, no attempt was made to determine a safe amount of fish that could be eaten. The management of risk is difficult to undertake for an entire population and an amount that may seem safe to one individual may seem very risky to another. The proposed plan quoted the fish consumption advisories verbatim; however, the presentation at the two public meetings did contain a reference to that 54 g (1.9 oz)/day amount and this may have caused some confusion. The state advisory program contains a no-consumption advisory on certain fish species that may be considered safe to eat once a month or five times a year or for one week each year (as a tourist might do), but by law the program must try to protect the most sensitive members of our population and the people who may be accustomed to eating fish several times a week during most of their lives.

The fish consumption advisories are provided in special brochures, the Tennessee Fishing Regulations (which all fisherman who keep what they catch must obey), in TVA's annual *Riverpulse* report, and on signs posted at most public access points that are paved or maintained by government funds. TDEC has agreed that some public access areas may not be posted or may have had the signs stolen or vandalized (a common problem), and they will try to correct this problem. In addition to listing which species should be avoided in the various lakes, the advisories describe methods of preparing and cooking the fish to reduce the amount of contaminants consumed.

TDEC conducted turtle sampling and analysis for PCBs recently and the report is expected to be available to the public in March 1997. Based on the data provided in this report, TDEC will determine whether posting the reservoirs to advise against consumption of turtles is necessary. Turtle sampling will be

added to the scope of the monitoring program mandated in this ROD. In response to these comments, a survey will be added to the monitoring program in an effort to determine the effectiveness of the fish consumption advisory program.

Comment: Bob Peele and the ORREMSSAB wanted to know why manganese is treated as a ubiquitous, non-DOE-related contaminant in some areas of the RI or proposed plan, and is listed as related to K-25 Site activities in other areas of the RI.

Response: Statements in the executive summary and in other areas of the RI refer to manganese as ubiquitous in surface waters throughout the region, and therefore to some extent the sediments throughout the region also contain some manganese. The sediments immediately downstream of the Technology Park contain elevated levels of manganese thought to be related to DOE operations. Manganese concentrations were triggering human health risk criteria throughout the operable unit, not just downstream of the Technology Park. The elevated levels in Poplar Creek were more elevated than naturally high background levels; however, they made no significant change in the risk associated with that area of the OU.

Comment: ORREMSSAB in the proposed plan, only sediments in the main channel of the Clinch River or main creek bed of Poplar Creek are noted to present potential risk to human health. Nothing is said in the plan about how the preferred alternative protects the public from contamination of near-shore sediments. A reader could conclude that no significant levels of contaminants were found to be present in near-shore sediments. For instance, Tables E-35 through E-37 (Appendix E, RI/FS) clearly show that a number of contaminants exceed the acceptable noncarcinogenic hazard index of 1.0 for several reaches of the Clinch River and Poplar Creek. The excess lifetime cancer risk of 10^{-4} (1 occurrence of cancer in 10,000 people) is also exceeded when risks are added across pathways for some subreaches.

There is no indication in the plan why these risk levels are acceptable. An alternative to reduce these risks should be favored unless there is valid reason to discount these high levels. Either some institutional control to inhibit human contact with near-shore sediment in the less safe reaches must be devised and shown effective, or the most seriously contaminated near-shore areas that are accessible should be treated in a manner similar to Alternative 3 or 4.

The FS indicates that many of the high risk levels are within the reservation along Poplar Creek and are therefore under institutional control preventing residential use. Since such control is important, the ORREMSSAB recommends that this control be listed in the preferred alternative. Such controls must also seek to prevent sediment contact by fishermen who may access Poplar Creek by boat and wade in shallow portions.

Response: By far, the majority of the noncarcinogenic hazard for Clinch River and Poplar Creek near-shore sediments is derived from manganese. Manganese is a naturally occurring and ubiquitous metal, present at relatively high concentrations throughout eastern Tennessee. No other contaminant by itself exceeds the hazard index of 1.0. The carcinogenic risk is only exceeded when risks are summed for all contaminants and all pathways in a given subreach. No single pathway would be determined to be a pathway of concern. Two subreaches (one in Poplar Creek and one in the Clinch River) when added across all contaminants and all pathways do provide a carcinogenic risk of 1.8 and 1.1 H 10^{-4}, respectively. However, in both cases, the risk is driven by the presence of chromium. Chromium usually occurs in two states in the environment, Cr(III) and Cr(VI). Chromium-6 is much more toxic but reacts over time to form Cr(III). The conservative risk assessment methodology used for this RI assumes all chromium to be Cr(VI), assumes 8 hours of exposure each day for 175 days per year (the entire period of water drawdown) for 30 years, uses models to predict airborne particle generation from sediments, and uses the upper 95 percent confidence level concentrations of contaminants rather than actual values or means/averages. Given the extreme conservatism built into the risk assessment, the fact that sediments rarely dry out enough to generate dust during the winter months, and the fact that the hazard is primarily driven by manganese, the FFA parties felt that no real threat is being posed to the public. The area within Poplar Creek that is slightly worse than the Clinch River area is within ORR and is controlled so that residential development cannot take place. The fishermen in question would definitely not be at risk based on exposure durations.

Comment: Mr. Campbell, Ms. Bryan, and the ORREMSSAB question the amount of data obtained at Kingston City Park. They wonder if enough sampling occurred and if the samples were deep enough, and how safe it is for children to swim and wade in these public recreation areas.

Response: In 1991, TVA collected five 30 cm (12-in.) core sediment samples from the swimming area at 12 recreation areas on the Tennessee River, including Southwest Point Park (just downstream of Kingston City Park), and 7 areas on the Clinch River. These data indicate no health risks in the Kingston area any different from those throughout the state. DOE has in the past conducted near-shore sampling throughout the Clinch River/Watts Bar system; those data support the conclusion that near-shore recreation areas are not contaminated to the extent that human health risk is a problem for the child recreational user. A comparison of the TVA data from Southwest Point Park with the DOE data and preliminary remediation goals from the RI indicate that the risks associated with this particular recreation area are not high enough to be of any concern to the recreational user. In addition, TDEC recently completed a radiation screening of public recreation and access areas along the Clinch River and will make this report available to the public in March 1997. TDEC's results indicate background levels of radionuclides at these recreation areas. The radionuclides are known to be a very good indicator of

DOE-related contamination at a site because most of the high releases of contaminants in the past were accompanied by radioactive contamination. In summary, DOE, TDEC, and TVA all feel that the safety and welfare of recreation area users is not at risk because of DOE-related contamination (and based on TVA data, any other source of contamination).

Comment: The ORREMSSAB recommends that exposure to near-shore sediment should be included in the swimming/wading scenario.

Response: The risks to individuals in the shoreline use scenario were driven by inhalation of sediments, not dermal contact. In the summer, when swimming and wading take place, no inhalation of sediments takes place and risks are low. Additionally, EPA guidance documents for conducting risk assessments state that in most cases it is unnecessary to evaluate human exposures to sediments covered by surface water. The surface water tends to be the carrier for contaminants that will permeate the skin, and evaluation of dermal contact to the water itself is sufficient to fully characterize the risks.

Comment: On p. 2-8 of the RI/FS it says that sediments were dredged from the Clinch River between Grubb Island and Melton Hill Dam in 1952 and 1962 and dredged materials were placed on Grubb and Jones Islands. Much of this stretch of the river is downstream and in close proximity to White Oak Creek and is likely to have been contaminated. Exposure to these materials was not addressed in the risk assessment and risk remediation of the islands is not included in the Plan. The ORREMSSAB recommends that remediation of the islands or controls on use thereof should be included in the Plan unless it is being addressed under another activity.

Response: TVA, as published in *Sediment Characterization Task 2 In stream Contaminant Study* in April 1985, found that samples collected on Grubb Island (CRM 18.3) and Jones Island (CRM 19.7, 20.1, 20.5, and 20.6) revealed concentrations of contaminants in the range of those reported for the Tennessee River upstream of any DOE influence, indicating no significant contamination on the islands. Additionally, TVA owns these islands and restricts them to recreational use for which all near-shore sediments in the OU are not a risk.

Comment: In Table B-5 (Appendix B, RI/FS), metal concentrations in surface water are compared to ambient water quality criteria. One column in this summary table is labeled maximum detection limit. It is unclear whether the column should read minimum detection limit or maximum detected and the reader is unable to conclusively compare the data to the ambient water quality criteria. The ORREMSSAB recommends that clarity be provided in the RI/FS report.

Response: The column should read minimum detection limit and it was presented in Table B-5 as a way of flagging those criteria for which compliance is difficult to evaluate. It is useful in those cases where all or most values are nondetects and the maximum detection limit is less than the criteria. It also serves to note those criteria/analyze combinations where at least some of our data are inadequate (i.e., if the minimum detection limit is greater than the criterion). In these situations it is difficult to evaluate compliance, and this table seemed an appropriate way to identify these situations. In general, the detection limits were adequate for the purpose of evaluating compliance in those reaches investigated most thoroughly (Poplar Creek, McCoy Branch, and the lower Clinch River). Detection limits are less adequate for some of the upstream reference reaches or for certain analytes that Oak Ridge Reservation Environmental Monitoring (ORREM) measured but the RI team did not. In both cases, we relied primarily on ORREM data and we have more problems with detection limits. As a rule, though, our data are adequate for contaminants of concern in the reaches of concern. Neither the RI/FS nor the proposed plan will be revised; rather, the responses to comments will be documented in this ROD.

Comment: It is known that people living in areas adjacent to the Operable Unit I ingest turtle meat. Sampling of turtle tissue is not reported in the RI/FS or considered in the risk assessment. The ORREMSSAB recommends that this potential exposure scenario should be evaluated and the results included in the plan.

Response: TDEC has completed a study on PCBs in turtles and the report will be available in March 1997. It is expected that the turtles will have concentrations similar to or higher than the fish on which a risk assessment was performed. TDEC is considering the addition of turtles to the advisory program. Turtles will be sampled as part of the monitoring program associated with the preferred alternative.

Comment: On p. 5-19 of the RI/FS it is stated that only adults were considered for exposure to carcinogens in the risk assessment because the end result would not be substantially different than if children were considered. It is generally accepted in the health sciences community that children may be more susceptible to the effects of carcinogens than adults. Therefore, the ORREMSSAB recommends that risk calculations for child exposures to carcinogens should be conducted and the RI/FS amended to include them. In addition, the ORREMSSAB recommends that the fact that children were not evaluated when considering exposure to carcinogens be included in the uncertainty analysis in the RI/FS. Discussion of increased susceptibility of children, as well as other populations such as pregnant women, should also be included in the uncertainty analysis.

Response: Children were evaluated separately for those pathways where differences in body weight and ingestion patterns cause children to be more susceptible. (See RI Tables E41 versus E42 and E44 versus E45.) Even though children have a greater exposure factor compared with that of adults (a factor of roughly 2; intake is typically half that of adults, but body weight is only a fourth), this factor is applicable to only 6 years of the 30-year exposure period for carcinogens. The combination of these parameters results in a factor of about 1.2 over the full 30-year exposure period. Given the uncertainties and considerable conservatism in risk assessment, this is not considered a substantial.

Comment: Mr. Peele asked about the accedences of ambient water quality concentrations mentioned in the proposed plan.

Response: In upper McCoy Branch embayment, the AWQC for human recreation was exceeded for arsenic. This criterion assumes that X concentration in surface water equals Y concentration in fish tissue (and furthermore that Y concentration is harmful to fish, although Y is based on FDA tissue concentrations). By sampling fish and analyzing them for arsenic, DOE showed that fish were not being impacted by the periodic high levels of arsenic in the surface water. Those arsenic levels did not exceed drinking water standards. In Poplar Creek, mercury exceeded the AWQC for fish and aquatic life but again did not exceed drinking water standards. Actions ongoing at ORR are addressing both the source of arsenic to McCoy Branch and the source of mercury to Poplar Creek. It is hoped that these actions will eventually lower the surface water concentrations to below the AWQC. Allowing these other actions time to be effective is much more sensible than spending enormous amounts of time and money attempting to treat McCoy Branch embayment or Poplar Creek.

Comment: Mr. Campbell asked if the monitoring program would include grab samples of sediment, and how many years it would last. The ORREMSSAB suggested that surface water be included in the monitoring program, that it should include suspended sediment during flooding or low flow conditions, and that potable water intakes be sampled. The LOC and the ORREMSSAB also recommends that turtles be sampled in the monitoring program. The ORREMSSAB recommends that plans to inhibit irrigation be included in the monitoring program. The ORREMSSAB desires to participate in the meetings that will be held to determine the exact details of the monitoring program. Ms. Bryan wanted to know if the water intakes are monitored, what analyses are performed, and under what laws. Mr. Josh Johnson asked what projections were made to come up with the $3.6 million cost estimate for the remedial action. The LOC questioned if the $3.6 million included the cost of the fish consumption advisory program, or the revenue loss to downstream communities from loss of tourism.

Response: The monitoring program will consist of surface water sampling near municipal intakes, sediment core samples throughout the OU, fish and turtle samples throughout the OU, a survey to determine the effectiveness of the fish consumption advisory program, and a survey to determine the amount of long-term irrigation occurring within the OU. The exact locations, analytes, and numbers of samples will be determined in May 1997 at a meeting with DOE, TDEC, EPA, and other stakeholders who may desire to send a representative (such as TVA, COE, and the ORREMSSAB). The program would last as long as necessary, with regulatory review at least every 5 years. With the current amount of data on surface water and the absence of any real threat to human health from the surface waters within this OU, extensive storm/drought sampling is not necessary or cost-effective. Contaminants leaving ORR are diluted tremendously as they enter Poplar Creek or the Clinch River, and high flow events compound that dilution. During low flow periods, very few contaminants will be washing out of the contaminated areas on ORR to enter the system. The analyses are performed on unfiltered samples that include any suspended sediments collected during the sampling event.

If the survey data indicate that there are people who irrigate to the extent that it could be a risk, DOE would address that problem through some type of remedial action. Similarly, if the surveys determine that fish consumption is a realistic threat to the local population, DOE would work with TDEC to address that problem in a protective manner.

Water intakes are monitored by the treatment plant in order to determine what treatment techniques will be needed to clean that water to the desired level. Legally, treatment plants monitor the water they discharge either to the public utilities or to the environment. The Safe Drinking Water Act of 1974 regulates the drinking water plants and determines in part what analyses they perform. DOE will monitor the water around the intakes as part of the monitoring program, and will analyze the samples for all DOE-related contaminants that may pose a risk to human health. The waters within the OU already meet drinking water standards (other than possible biological contamination) before the water is run through the treatment plant, which makes it safe for the public to drink.

The cost estimate for this monitoring program was based in part on the cost of a similar program already implemented for Lower Watts Bar Reservoir. The cost may increase slightly because the monitoring program is being expanded as a result of public comments. Not included in the cost estimate were sampling of turtles, a survey of fish consumers, and a survey for irrigation activity. Finally, the cost quoted in the proposed plan was a present-worth cost, and was labeled as such. The present-worth cost of a remedial action is the amount of money that would have to be invested today at some standard interest rate and rate of inflation to fund the projected costs out to 30 years. Thus the present-worth cost may appear low because it is not the total amount of money that will be spent during those 30 years. The cost of the fish consumption advisory program is not included because this is an ongoing program that was in existence long before this project began and is done to fulfill the requirements of state law. Any

revenue loss due to decreased tourism is not something that can be calculated readily and would also not be due solely to DOE contaminants. PCBs are the primary contaminant of concern in fish tissue and are attributable to almost every industry and municipality within the watershed. The advisory program is implemented within this OU in the same manner as it is throughout the state of Tennessee (and other states as well), and has little to do with DOE influences or releases.

Comment: The ORREMSSAB and the RCERB want to know how the proposed dredging for a barge terminal at the Technology Park would be handled and would input from downstream users be solicited.

Response: The Interagency Agreement for Watts Bar Reservoir Permit Coordination was established for one reason: to allow the agencies with permit authority over actions taken in Watts Bar Reservoir (TVA, COE, and TDEC) to discuss proposed sediment-disturbing activities with DOE and EPA relative to any DOE contaminants that may be present in the sediments before conducting the normal permit review process. The WBRIWG consists of the above named groups because of their permit authority or their knowledge of the sediment contamination and how that contamination may impact the public if disturbed. The basic process of obtaining a permit is the same for any organization or individual: (1) an application is completed and submitted to TVA/COE/TDEC (depending on scope of activity); (2) if the proposed activity would occur within Watts Bar Reservoir or its tributaries, the application is forwarded to the WBRIWG for review; (3) the WBRIWG reviews available data for the location involved or DOE collects any necessary data on sediment contamination; (4) if the location appears to be uncontaminated or clean enough to pose no significant health risks, then the application is forwarded back to TVA/COE/TDEC for their standard review process; and (5) if the location appears to be contaminated and sediments may pose a health risk, DOE works with the applicant to determine how best to approach the conduct of the requested activity (assuming TVA/COE/TDEC permit the action based on their own statutory program of review). The interagency agreement covers any potential sediment-disturbing activity (other than locations predetermined to be free of DOE-related contaminants) and thus barge terminal construction would be covered. Barge activity is ongoing on the reservoir and need not be permitted or reviewed by the working group.

If dredging is necessary in a location with contaminated sediments, DOE will assume the financial and waste management responsibility that is over and above the costs that would normally be incurred and the dredging and subsequent disposal of sediments will take place in accordance with best management practices and in compliance with all state and federal laws regarding downstream impacts and disposal of hazardous and/or radioactive materials. Assuming that construction of the barge terminal is subject to federal review, it would also be subject to public review and comment through the NEPA process.

Fishing or other recreational activities do not qualify as potential sediment-disturbing activities and would not fall under the charter for the WBRIWG. Other agencies under other laws regulate fishing, wildlife, and boating activities, and general recreation does not seem in need of regulation. The use of the WBRIWG to review or permit other activities is not necessary or legally valid. The addition of other members and groups to the WBRIWG is unnecessary for the permitting process as it now works in accordance with the statutory authorities of TVA, COE, and TDEC.

Comment: The ORREMSSAB recommends that if Poplar Creek surface water contamination is seen to increase, DOE review the possibility of treating the whole flow of Poplar Creek.

Response: Treating the entire flow of Poplar Creek would involve the construction of an enormous plant with acres of water holding ponds similar to a plant for a large city like New York City. The cost of this effort would likely consume DOE's entire Environmental Restoration budget for several years. This does not seem reasonable or cost-effective for a creek that did not exceed drinking water standards during the RI.

Comment: Mary Bryan/the ORREMSSAB desires the opportunity to comment early in the RI phase of a project.

Response: We are currently following the CERCLA process for obtaining public input and comments. The DOE public relations department is continuing to work with the ORREMSSAB and has begun providing early drafts of DOE's CERCLA documents to the ORREMSSAB for review.

Comment: Mr. Peelle recommends that DOE issue periodic reminders and begin education campaigns in the schools regarding the controls and advisories that are part of this remedial action.

Response: The only control really applicable to the general public is the fish consumption advisory program implemented by TDEC. DOE will be conducting a survey as part of the monitoring program to determine whether this program is entirely effective. Should the program be found ineffective, DOE will work with TDEC to increase public awareness of these controls. The same holds true for irrigation practices within the OU. The sediment disturbance controls are for deep sediments that are not exposed to the general public and cannot legally be removed or disturbed without following the permitting process of TVA, COE, and TDEC.