Department of Energy

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

March 4, 2003

Mr. David Mosby, Chair
Oak Ridge Site Specific Advisory Board
Post Office Box 2001, EM-91
Oak Ridge, TN 37831

Dear Mr. Mosby:

RESPONSE TO COMMENTS ON THE *ENVIRONMENTAL ASSESSMENT FOR PROPOSED CHANGES TO THE SANITARY BIOSOLIDS LAND APPLICATION PROGRAM ON THE OAK RIDGE RESERVATION*, DOE/EA-1356

Enclosed is a table detailing the Department of Energy's (DOE's) response to comments provided on the subject document by the Oak Ridge Site Specific Advisory Board. These comments, along with many others received by numerous individuals and organizations, were incorporated, as appropriate, into the final Environmental Assessment. A response table for all reviewers' comments has been incorporated into the appendix of the final document.

The Environmental Assessment has been reviewed in accordance with DOE Order 451.1B, paragraph 5a(9). Based upon this review, it has been determined that within the meaning of the National Environmental Policy Act, the proposed action is not a major federal action significantly affecting the quality of the human environment. Therefore, a Finding of No Significant Impact (FONSI) was signed on February 16, 2003.

We appreciate your comments on the document, and we thank you for your continued advice and recommendations. If you have questions, you may contact Harvey Rice of DOE Oak Ridge Operations at 241-2157.

Sincerely,

David R. Allen
ORO NEPA Compliance Officer

cc w/enclosure:
Dave Adler, EM-91, ORO
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Environmental Management
Mail Room/55 Jefferson
DOCS Number 97646
File Code

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DOE Oak Ridge Operations Environmental Management Comment Resolution for the Environmental Assessment for Proposed Changes to the Sanitary Biosolids Land Application Program on the Oak Ridge Reservation, DOE/EA-1356

#	Author	Comment	Response
1	ORSSAB	More information is needed on the soil hydraulic conductivity and other physical properties of the soils for the six active sites, which total 329 acres.	All of the 6 active land application sites had full hydrogeologic evaluations (November 22, 1983 and August 24, 1989) that were performed by Mr. Glenn N. Pruitt, Geologist of TDEC-Division of Solid Waste Management and Mr. Terry Gupton of TDEC-Division of Water Pollution Control **prior** to commencement of biosolids land application operations. Each evaluation recommended the sites that are currently active for land application operations. Detailed descriptions of soils and geology on the sites are available in Section 3.4.2, Site-Specific Geology. References to the hydrogeologic evaluations that have been performed will be added to this section as well as to Section 7.0, References.
2	ORSSAB	The map on page 1-6 needs to be revised and enlarged to show soils (i.e., recent soils map showing soil application series).	The map that is provided on page 1-6 is the standard map that has been and is currently being used in documentation for the Oak Ridge Biosolids Land Application Program. The desired objective of the original map is to simply show the location of the active land application sites on the Oak Ridge Reservation.
3	ORSSAB	The map should have corresponding tables and legends, which identify the six active sites with data that incorporate estimates of exposure under worst scenario antecedent moisture conditions and lowest hydraulic conductivity.	The map that is provided on page 1-6 is the standard map that has been and is currently being used in documentation for the Oak Ridge Biosolids Land Application Program. The desired objective of the original map is to simply show the location of the active land application sites on the Oak Ridge Reservation. For the dose modeling the RESRAD default values for hydraulic conductivity were used which are 100 meters/year for the saturated zone and 10 meters/year for the unsaturated zone. In the RESRAD model, the volumetric water content of the contaminated zone is the product of the saturated water content of the contaminated zone (0.4) and the saturation ratio of the contaminated zone which is the ratio of the infiltration rate in meters/year and the saturated hydraulic conductivity raised to 1/(2b+3) where b is a soil-specific exponential parameter (default value for b = 5.3). As indicated by the sensitivity analysis, these parameters do not greatly influence the dose calculation. This is the reason the RESRAD defaults are used, they are generally considered conservative.

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4	ORSSAB	More history on the six active sites as well as the inactive sites would be helpful in narrative form. Site history should also be taken into account in the estimation of the margin of safety for the maximally exposed individuals.	Extensive work has gone into providing complete and detailed information relative to all active sites and is available in Section 3.0 and Appendix B, Section B.2, Tables B.5 through B.10. The tables condense the verbiage from various sections and tables into a fact sheet for each site, aiding the reader in the understanding of what levels of contaminants are currently found at what levels and other important environmental factors such as bodies of water, wetlands, etc. for each site. To the knowledge of the authors and DOE-ORO the sites that are currently being used for land application operations did not have any past historical experimental or operational projects conducted on them. Modeling assumptions for the land application site RESRAD and Risk Assessment portions of this EA utilize an extremely conservative 24-hour/365-day exposure scenario using 9 pathways for an on-site individual and are therefore considered "worst-case". Because there is no prior history on these sites, it is assumed that sites began with no contaminants. Therefore, application soil radionuclide limits for 23 separate nuclides utilizing a maximum dose of 10 mrem/yr for on-site individual was developed. Biosolids limits were back-calculated for these nuclides in Appendix D. The margin of safety is calculated by using the predictive modeling performed in Appendix E. This model predicts the concentration of radionuclide levels within the application site soils at the end of site life. The maximum projected level is at the Rogers Site which is 56.8% of the 4 mrem/yr limit or 20.1% of 10 mrem/yr limit. This demonstrates a safety factor of almost 80% for the proposed limit of 10 mrem/yr. Inactive sites are not discussed as they are not planned for future use and are therefore not part of the scope of this EA.
5	ORSSAB	What were the prior uses and proximity of individuals over time to the sites? This information needs to be provided for the other sites: Watson Road, Scarboro Road, Rogers, McCoy, Cottonwood and Site 8.	Wording will be added to Section 1.2.1 regarding the past history of the application sites. To the knowledge of the authors and DOE-ORO the sites that are currently being used for land application operations did not have any past historical experimental or operational projects conducted on them. The sites are not adjacent to existing structures, houses, landmarks or recreational areas and are somewhat isolated from the public except for coordinated turkey and deer hunts and security personnel. Inactive sites are not discussed as they are not planned for future use and are therefore not part of the scope of this EA.
6	ORSSAB	On page 1-5, the paragraph relating to the city of Oak Ridge's plans, as of the summer 2001, needs to be updated. Some discussion of what has transpired since then is needed. Change the tense from "plans" to "planned."	Wording has been changed to reflect the past tense. The city of Oak Ridge has already installed and begun processing the new biosolids product.

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7	ORSSAB	In light of the August 2002 referendum's defeat, the financial status of the city's operations and planned improvements needs to be re-evaluated and discussed. Some cost data on the new system and also on its long-term maintenance are necessary.	This request is not within the current scope of this environmental assessment. The city of Oak Ridge is responsible for the treatment and processing of biosolids produced at the wastewater treatment plant. The active land application sites are authorized to accept Class B (lower classification of biosolids). The city's new system produces Class A (highest classification of biosolids) and can land apply biosolids produced from their wastewater treatment plant on the Oak Ridge Reservation or private property. How the city's system operates and what it costs is not relevant to this environmental assessment as long as all state and federal regulations are followed during the application of biosolids.
8	ORSSAB	Please explain the statement on page 1-5 that refers to the city's planned new treatment system, which would "increase solids content and sterilize biosolids...resulting in more manageable and safer material." What is meant by "more manageable and safer?"	A detailed discussion of why the process is safer and more manageable is available on Pages 4-6 and 4-7 of the EA. The city of Oak Ridge produced liquid, Class B biosolids which had low biological activity and were difficult to handle due to the highly fluid mobility of the biosolids (approximately 98% water). The new biosolids treatment system produces >90% solids (<10% water) which can be easily transferred to the application vehicle and any spills of the material are immobile as compared to the highly maneuverable liquid previously applied on the application sites. Also, solid biosolids produced by the city are sterilized or biologically inactive and can be land applied without the restrictions that Class B biosolids must meet. The result is a safer, more manageable material.
9	ORSSAB	The Executive Summary identifies an alternative to the proposed dose rate increase being "to leave the existing Oak Ridge Reservation land application sites altogether in favor of free distribution of the biosolids material to the public." It would seem that this option could be a cheap and easy alternative, and it should be evaluated.	This statement was made in regards to a potential city of Oak Ridge action - not a DOE action. Non-federal activities conducted on private property are not required to undergo a NEPA evaluation.
10	ORSSAB	How close to the 4 mrem/yr are we actually now? Or does the gamma monitoring not give enough data for this to be calculated?	Appendix B, Tables B.5 through B.10 provides an up-to-date calculation of how much of each radionuclide has been applied on each active site. Each site level is well under the established 4 mrem/yr limit using the sum of fractions methodology (limit = 1).
11	ORSSAB	Appendix D is based on a 20-year program, and it is also stated that we have 7 years remaining in that program; this would give a start date of 1989. What does 1989 correspond to, in reference to the Land Application Program started in 1984 and Oak Ridge National Laboratory (ORNL) adding waste in 1999?	Although all of the sites received approval for the land application of biosolids in 1984, with the exception of the Watson Road site (1989), the city of Oak Ridge began using the active sites in 1989. From 1984 to 1989 other inactive program sites were used. The city of Oak Ridge began accepting ORNL biosolids in 1999.

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12	ORSSAB	Europium-155 has a higher limit than uranium (Table D.3). Does this imply that europium is a fairly large contributor? What is its source?	A higher soil guideline value implies less of a contribution to dose (i.e., it takes more Eu-155 to give a 10 mrem/year dose (for our exposure scenario) than most of the other radionuclides. The soil guideline for Eu-155 and uranium are very similar (i.e., they both make comparable contributions to dose), but the biosolids limit for Eu-155 is much higher than the biosolids limit for uranium. The reason for this is that the Eu-155 has a much shorter half-life (less than 2 years) so you can put more on the site each year without it building up over time. The ORNL biosolids are the potential source of Eu-155 in the city system.
13	ORSSAB	Why does the Rogers site have 56.8 percent of the allocated dose, according to Table 4.2?	Table 4.2 represents the predictive model results that 56.8% of the established limit would be attained at the end of the Rogers Site application site life. This site has the highest amount of calculated radioactivity loading to date as demonstrated in Table B.8 and therefore, would project to attain the highest level of radioactivity in site soils at the end of application site life.
14	ORSSAB	Why are cesium-137 concentrations in 1999 increased, uranium-235 concentration in 1996 high, and the uranium-238 concentration usually low compared to the limit (Table B.4)?	The cesium-137 concentrations increased in 1999 due to the acceptance of the ORNL biosolids. The U-235 level of 1.85 pCi/g is 1.1% of the 4 mrem/yr limit and is not considered "high". The decrease of U-238 is due to the Y-12 Plant sewer system rehabilitation project that was completed in 1999.
15	ORSSAB	Section 1.0, page 1-1, 2nd paragraph. The ORSSAB presentations and tour of the biosolids land application sites involved the ORSSAB Waste Management Committee, not the full Board, and were informational. ORSSAB has taken no previous position on this proposal.	Reference will be changed to the ORSSAB Waste Management Committee and in no way implied that ORSSAB has taken a position on the environmental assessment being reviewed. The reference was simply stated to point out public involvement activities prior to the issuance of this document.
16	ORSSAB	Section 1.1, page 1-2, 3rd paragraph. The 4 mrem/yr limit is coincidentally a drinking water maximum contaminant level for beta particles and photon radioactivity from man-made radionuclides. Use of the descriptor "self-imposed" oversimplifies the issue of setting a standard for radionuclides in sewage sludge and conveys a lack of objectivity in preparation of this environmental assessment.	There are no radionuclide limits for biosolids products in the United States. The original RESRAD modeling for radionuclides performed for the Oak Ridge Biosolids Land Application was originally based upon the 4 mrem/yr drinking water standard and expanded from 4 to 21 radionuclides in the 1996 environmental assessment on the program. This list was expanded to 23 radionuclides for the 10 mrem/yr planning limit in the current environmental assessment. Because of the fact that there are no radionuclide limits for the application of biosolids, the limits presented for the biosolids and application site soils are by definition "self-imposed", as no other regulatory body has developed and implemented these standards for any land application program in the nation.

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17	ORSSAB	Section 1.2.1, page 1-5, 2nd paragraph. More details on the proposed thermal treatment system need to be provided and the fate of radionuclides undergoing thermal treatment in the proposed system evaluated as part of this environmental assessment.	Years of operational monitoring for radionuclides within the Oak Ridge Wastewater Treatment System have demonstrated that the vast majority of radionuclides contained within the discharges end up in the biosolids phase of the treatment process. This data was based upon a liquid biosolids treatment system. With the installation of the new solids treatment system, the system further enhances the removal of any residual nuclides from wastewaters and the "fate" of these nuclides is assumed to be the land application sites. All modeling assumes 100% of the radionuclides will go to the biosolids phase of the treatment process, which is extremely conservative as discussed on Page 4-9 of the EA. In reality, a loss of radionuclides could occur at the wastewater treatment plant; however, these treatment operations are conducted by a non-federal entity (city of Oak Ridge) on private property which is not required to be evaluated by a NEPA review. Moreover, specific details of the city biosolids treatment process equipment does not have any value added since 100% of the radionuclides are assumed to be land-applied on the active sites.
18	ORSSAB	Section 1.2.1, page 1-7, 2nd paragraph. The results of the survey of publicly owned treatment works for baseline radioactivity associated with biosolid products needs to be discussed in this document if available from late 2001.	The results of this survey were expected to be published by the EPA and NRC within the original referenced timeframe; however, they were not available at the time of publication of this environmental assessment. Reference will be changed to "in future months."
19	ORSSAB	Section 1.2.1, page 1-8, 2nd paragraph. The letter from the Tennessee Department of Environment and Conservation-Division of Radiological Health claimed as approving the increase to 10 mrem/yr appears to only acknowledge concurrence at a planning level. The letter provided in Appendix A does not appear to be personally signed by the past division director.	Acknowledged. The reference will be changed from "approval" to "concurrence". Both the 4 and 10 mrem/yr are "planning levels" as it is not expected that the maximum limit will ever be achieved especially given the fact that the active sites have been in use for some time and have varying levels of life expectancy remaining. Because of a lack of radionuclide standards for any land application program, "concurrence" rather than "approval" is appropriate. The letter provided by the city of Oak Ridge was produced on TDEC-Division of Radiological Health letterhead and properly signed. There is no reason to doubt the authenticity or content of the concurrence letter in question.

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20	ORSSAB	Section 1.2.2, page 1-11, 1st paragraph. According to the Oak Ridge Reservation Annual Site Environmental Report for 2001, Outfall 502 (West End Treatment Facility) had zero discharge for the calendar year. Please provide details on what portions of the approximately $133,000 cost are due to effluent monitoring and treatment process changes and be clear whether the proposal comparison is based on past or current operations.	The management and operations contractor for the West End Treatment Facility (WETF) is WSMS-MK. Since work began on the preparation of this environmental assessment, WSMS-MK gained approval from TDEC to begin bulking treated wastewaters for a bulk discharge through Outfall 502. In 2001, wastewaters were bulked and not discharged. Approximately $58,000 of estimated $133,000 in cost savings is based upon past operations and includes all analytical costs, additives, etc associated with the final WETF discharge operation.
21	ORSSAB	Section 1.3, page 1-11, 1st paragraph. Why not evaluate additional alternatives, such as retaining the 4 mrem/yr limit with addition of Y-12 West End Treatment Facility discharge and excluding ORNL or East Tennessee Technology Park biosolids or other problematic discharges?	Authorization to discharge to the city of Oak Ridge Sewer System is a city of Oak Ridge Management decision. The city of Oak Ridge has stated that if the 10 mrem/yr planning limit is not adopted, the city of Oak Ridge would have no choice but to reduce the radionuclide discharges to the city sewer system beginning with the most recent discharger (ORNL biosolids), not allow the addition of WETF and lower other DOE and commercial contributors in an effort to accommodate any new entities. This would severely limit all new and existing radionuclide discharges to the city system. The city may also choose to leave the Oak Ridge Reservation and sell or give away Class A biosolids to members of the general public that expressed an interest in beneficially re-using the material.