December 3, 2009

Mr. E. Kurt Hackmann
Director, Hematite Decommissioning Project
Westinghouse Electric Company
3300 State Road P
Festus, MO 63028

SUBJECT: WESTINGHOUSE HEMATITE 10CFR20.2002 ALTERNATE DISPOSAL REQUESTS FOR ADDITIONAL INFORMATION

Dear Mr. Hackmann:

By your letter dated May 21, 2009, you submitted a request for alternate disposal approval in accordance with 10 CFR 20.2002 for Westinghouse's Hematite Fuel Cycle Facility and for exemptions from 10 CFR30.3 and 10 CFR 70.3 for waste containing byproduct and special nuclear material, respectively. The staff has reviewed your requests. As a result of that review the staff has identified areas where additional information is required in order to complete its review.

Enclosed are a number of requests for additional information (RAI). Previously, the staff had emailed to you draft RAIs. These RAIs were discussed conference calls with members of your staff. The purpose of the conference calls associated with the discussion of the draft RAIs was to ensure that the information that the staff is requesting had not been previously provided by Westinghouse or was not included in the Westinghouse application but has been overlooked by the staff. In addition, the conference calls were also held to ensure that the RAIs are clear with respect to the specific information that was being requested. The enclosed RAIs are the result of the discussions which occurred during the conference calls. You will note that the previously discussed RAIs may have been revised, deleted or new ones generated as a result of the calls.

In accordance with 10 CFR 2.390 of the U.S. Nuclear Regulatory Commission's (NRC's) "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Please provide your response to the RAIs within 30 days of the date of this letter. If you have any further questions, please contact me at (301) 415-5928 or via email at john.hayes@nrc.gov.

Sincerely,

/RA/

John J. Hayes, Senior Project Manager
Materials Decommissioning Branch
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Enclosure:
Request for Additional Information

cc: see next page

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Enclosure:
Request for Additional Information

cc: see next page

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20.2002 Authorization for Westinghouse-Hematite Decommissioning Project

Request for Additional Information

MC& A

1. **Comment:** Additional information is needed to specify how high-enriched uranium (HEU) remediated and/or recovered materials will be managed for shipping. Up to 30 kilograms could be shipped to U. S. Ecology, Inc.

Basis: Westinghouse-Hematite anticipated that certain HEU residues may be recovered from the burial pits during the decommissioning project. It is estimated that a total quantity of up to 30 kilograms of materials could be obtained.

Path Forward: Provide a material control and accounting (MC&A) contingency plan and related MC&A control measures to ensure that the facility is compliant with the regulatory requirements for handling HEU materials, and that discrete quantities of HEU materials will not be shipped to the U.S. Ecology Idaho site, which is not licensed to receive those materials.

2. **Comment:** Additional information is needed to describe how the facility's wastes, contaminated with special nuclear material (SNM), will be handled and controlled at the U.S. Ecology Idaho site, a non-U.S. Nuclear Regulatory Commission (NRC) licensed facility.

Basis: Westinghouse-Hematite plans to dispose of the SNM-contaminated wastes to the U.S. Ecology Idaho site, and this disposal facility does not have an MC&A program for handling Special Nuclear Materials (SNM). In addition, the disposal of SNM is outside of the U.S. Nuclear Regulatory Commission's (NRC's) jurisdiction and oversight, especially given the quantity of SNM involved.

Path Forward: Provide near term and longer term MC&A approaches for disposal of SNM stored at the U.S. Ecology Idaho site with respect to material ownership, material controls, and material final disposal.

3. **Comment:** Additional information is needed for the use of U. S. Department of Energy (DOE)/NRC Form 741, Nuclear Material Transaction Reports.

Basis: Westinghouse-Hematite will process DOE/NRC Form 741 for transfer of SNM to the U.S. Ecology Idaho site, and this disposal facility does not have an MC&A program for meeting the reporting requirements of 10 CFR 74.15 associated with DOE/NRC Form 741.

Path Forward: Provide the practices to be employed by Westinghouse-Hematite and the U.S. Ecology Idaho facilities to meet the reporting requirements of 10 CFR 74.15.

Enclosure

Health Physics

1. **Comment:** Additional information is needed to ensure Westinghouse Electric Company (WEC) is compliant with U.S. Ecology Inc (USEI) Waste Acceptance Criteria.

Basis: WEC estimates a waste volume of 22,809 m^3 (50,000 tons). This volume plus the non-contaminated materials is a large volume of material to be remediated, sampled and surveyed, and transported.

Path Forward: Provide a description of the radiological sampling and survey measurement procedures and quality control and assurance procedures to be employed by WEC to ensure WEC is compliant with the USEI waste acceptance criteria and the 3000 pCi/g total concentration limit.

2. **Comment:** Additional information is needed to clarify how materials, waste and other debris will be managed on site for processing.

Basis: WEC estimates a waste volume of 22,809 m^3 (50,000 tons). This volume plus the non-contaminated materials is a large volume of material to be remediated, sampled and surveyed, and transported.

Path Forward: Provide the methods and logistics to be employed to ensure radioactive waste homogeneity and the measures to ensure non-contaminated soil and materials are not blended or intentionally mixed with radioactive soil and debris to reduce the specific activity of the waste.

Performance Assessment

1. **Comment:** More information is needed about the airborne dust study.

Basis: The internal dose to the workers is dependent on the concentration of respirable dust in the air at their work locations while they are working. In the description of the airborne dust study in Section 6.1 of the safety assessment, it is stated that the airborne dust study was conducted for representative job categories and work locations. However, it is not clear if these job categories and locations are the same ones considered in the dose assessment. It is also not clear how the samples address the range of dust levels that could be present and whether they adequately represent mean concentrations for the workers.

Path Forward: Provide information about the locations sampled in the airborne dust study and the applicability of those locations and concentrations to the job functions evaluated in Table 2.

2. **Comment:** Additional information is needed about the source term.

Basis: It is not clear how the inventory in Table 1 was derived, and sample data supporting this derivation were not provided. In addition, in the Residual Radioactivity (RESRAD) analysis, the inventory of radionuclides from the Hematite waste was assumed to be evenly distributed across an area of 88,220 m^2 and a thickness of 33.6 m. The concentrations used for the contaminated zone in RESRAD were diluted from the concentrations in the waste provided in

Table 1 to account for this. If the waste from the Hematite site was disposed of in a more concentrated manner, then the resulting dose could be higher.

Path Forward: Provide a description of the methodology used to develop the inventory in the source term and associated sample data. Provide the basis for the assumption that the waste from the Hematite site will be disposed of homogeneously across the site and effectively diluted from the concentrations provided in Table 1.

3. **Comment:** Clarification is needed about the inventory and decay time assumed in the Microshield analyses.

Basis: Table 1 in the safety assessment contains a list of the radionuclides considered in the dose assessment and their expected concentrations. Many of these radionuclides have radioactive progeny, and it is not clear how the activities of the progeny used in the dose modeling were generated and what decay time was assumed. Additionally, it is not clear if the inventory in Table 1 corresponds to the current inventory in the waste or the inventory in the waste at its time of burial at the Hematite Site.

Path Forward: Clarify if the inventory presented in Table 1 corresponds to the current inventory in the waste, or the inventory at the time the waste was originally buried at the Hematite site. If Table 1 reflects the current inventory, provide inventories of daughter radionuclides at the current time. If Table 1 reflects the inventory at the time the waste was originally buried at the Hematite site, provide a description of how the activities of the current daughter radionuclides are generated, including the assumed decay time from the point of initial burial at the Hematite site.

4. **Comment:** Information is needed about the chemical form and solubility of the uranium in the waste.

Basis: Uranium that is in the soluble form could leach from the waste and reconcentrate in the subsurface. This could potentially result in the uranium becoming present in a configuration and concentration that could pose a criticality hazard. The criticality analysis assumes that uranium is not in a soluble form, but the basis for this assumption is not included.

Path Forward: Provide information about the chemical form of uranium present and the solubility of it. If the uranium is in a soluble form, provide an evaluation of the potential for the uranium to reconcentrate in a critical configuration. If the uranium is not in a soluble form, provide a basis for this assumption.

5. **Comment:** The dose to an inadvertent human intruder should be analyzed.

Basis: Disposal in (Resource Conservation and Recovery Act (RCRA) disposal facilities should evaluate the intruder dose calculations. Simple methods may be used to scope or bound the problem, and more sophisticated approaches should be used as necessary. Radon from source material, byproduct or special nuclear material should be considered.

Path Forward: Evaluate the dose to an inadvertent human intruder.

6. **Comment:** The dose to the transportation workers should be assessed.

Basis: The analysis assumes that the disposal worker dose bounds the transportation worker dose based on the length of time of exposure and proximity to the waste. This is reasonable since worker dose at the receiving facility tends to be greater than the transportation worker dose. Still, further explanation should be provided as to what the approximate length of time the railroad employees would be working, what distance they would be from the waste, if the waste is to be covered during transport, and if they would be involved in the loading or unloading processes. A statement of explanation for why the public dose is bounded by the receipt facility worker dose should also be provided (e.g., distance from rail transportation routes to public residences).

Path Forward: Assess the dose to railroad employees and other members of the public during transportation from WEC to USEI, or provide further explanation as to how it is bounded by the receipt facility workers.

7. **Comment:** Clarification is needed for the times to complete a task provided in Table 2.

Basis: Table 2 provides the amount of time it takes to perform a task, but does not clearly state this is the time per task per worker.

Path Forward: Confirm that the minutes to perform a task in Table 2 are minutes per task per worker.

8. **Comment:** Clarification is needed on sharing of job functions.

Basis: Table 2 provides the number of workers sharing a single job function, but it is not clear if any of the same people will be performing more than one job function. If the same person is performing multiple job functions, then the doses for these job functions should be analyzed cumulatively.

Path Forward: Confirm that the same person will not be performing more than one job function. Or, if they are shared, provide the cumulative effects on the workers sharing job functions.

9. **Comment:** More information is needed on how site stability will be maintained, and the assumed erosion rate.

Basis: If there is little potential for significant disposal site instability, then a technical basis should be provided for this conclusion. The stability of the site can be impacted by natural surface and subsurface processes, and is also impacted by the stability of the waste and engineered barriers of the disposal facility. The analysis assumes an erosion rate that is ten times less than the default erosion rate in RESRAD. Erosion control barriers can be assessed considering rock durability, gradation, cover design, stability calculations for the slopes of the cover, or other construction considerations important to erosion control. Waste stability can be impacted by methods for waste packing which may help to prevent slumping or collapse of the disposal unit or cover.

Path Forward: Provide a technical basis for the erosion rate. Also, provide sufficient information to verify that the waste will remain structurally stable after disposal.

10. **Comment:** Justification is needed for the use of RESRAD for modeling the groundwater pathway and the parameters used in this model.

Basis: The dose assessment submitted by the licensee determined that the peak dose from the disposal of the Hematite waste at U.S. Ecology Idaho would be from Tc-99 through the groundwater pathway, making this pathway risk-significant. The RESRAD code was used to calculate this dose. However, justification was not provided for whether the conceptual model in the RESRAD code is appropriate for the conditions at the U.S. Ecology Idaho site. While RESRAD has been widely accepted and has a large user base among NRC staff and licensees, it may not be appropriate for all sites (i.e., sites with complex groundwater systems or geological conditions). Additional information is needed about whether the modeling done with the RESRAD code appropriately models or bounds the potential dose from the groundwater pathway at the U.S. Ecology site.

Additionally, the basis for the parameters used to model the groundwater pathway was not provided. Required bases includes those for the parameters entered for the contaminated zone and cover and contaminated zone hydrological data and the unsaturated zone, and saturated zone portions of RESRAD. The site description of U.S. Ecology Idaho included in the submittal contains information on the subsurface at the site, but it is not clear how the parameter values included in the RESRAD run were developed based on that information.

Path Forward: Provide justification for the use of RESRAD to model the groundwater pathway at the U.S. Ecology Idaho site. Provide the basis for the parameters used for the ground water pathway, including the contaminated, unsaturated, and saturated zones, in the RESRAD modeling.

Groundwater Pathway Parameters

1. **Comment:** Figures cited in the application are not included, such as Figure E-6, Figure-14, Figure E-16, and Figure E-19. It appears that these figures are part of the Site Characterization Report written by CH2M Hill in 1986.

Basis: N/A

Path Forward: Provide CH2M Hill, 1986, Site Characterization Report, including all tables, figures, and appendixes.

2. **Comment**: Justification is needed for the assumption of continued rising water level at the site.

Basis: In the section on Water Level Trends, a regression analysis, based on the assumption that water level continues rising at current rates, predicts that the water levels in the Upper Aquifer will reach the bottom of the missile silos in 36 to 53 years. This may have a potential implication on the waste disposal cell. No detailed logical augments or physical processes, however, were provided to support this continued rising water level assumption at the site. The

use of the regression analysis for predicting future water levels at the site needs further support of site specific conditions and physical processes.

Path Forward: Provide a detailed explanation why the assumption of a continued rising water level with current rates at the site is valid. 20.2002 Authorization for WEC Hematite

Environmental Review

1. Comment: As part of the Environmental Assessment, NRC needs information pertaining to the affected environment at the USEI site. Among the resources being considered by NRC is onsite and local air quality. Data of interest includes any job-specific or site-wide air sampling for radionuclides, hazardous chemicals or materials of interest to the National Ambient Air Quality Standards.

Basis: The Alternate Disposal Submittal contains no information concerning onsite and local air quality data.

Path Forward: Provide all local, state, and Federally-required worker, public safety and environmental air monitoring program plans which are both currently active and developed by or for USEI, and at least the past 5 years of air monitoring data collected under these plans, for the USEI disposal facility.

2. **Comment:** On July 24, 2009, Westinghouse provided NRC an application prepared by American Geotechnics for USEI (dated June 30, 2006) for a new disposal cell. However, appendices containing figures, information on cultural resources, economic impacts, and other relevant information were excluded. Staff believes that additional information contained in the appendices may be useful in preparing sections of the environmental assessment.

Basis: While the Alternate Disposal Submittal includes an application prepared by American Geotechnics for a new disposal cell, the information provided with the application excludes the appendices containing figures, information on cultural resources, economic impacts, and other relevant information.

Path Forward: Provide the entirety of the June 30, 2006, "Hazardous Waste Facility Siting License Application Cell 16," prepared by American Geotechnics.

3. **Comment:** The August 2005 WEC report "Environmental Report for Hematite Site Decommissioning," Section 3.11, Public and Occupational Health, contained information on historical worker-related injuries and illnesses at the Hematite Decommissioning Project (HDP). Staff requests that WEC provide the same types of data as provided in the Table below for the last 10 years for both the HDP and USEI, if available.

Table. Work-related injuries at the HDP

Year	Work Hours	Injuries	OSHA cases	Fatalities	Injuries per 10,000 hours
2001	438,404	67	50	0	1.5
2002	115,832	11	5	0	1.0
2003	86,736	1	0	0	0.1
2004	52,208	0	0	0	----
2005	##,###	#	#	#	#
2006	##,###	#	#	#	#
2007	##,###	#	#	#	#
2008	##,###	#	#	#	#
TOTAL	###,###	#	#	#	#

Basis: Information on historical worker-related injuries and illnesses at the HDP and at USEI is not contained in the Alternate Disposal Submittal. Staff requests that WEC provide the same types of data,

Path Forward: Provide recent information (2004-2008) on occupational injuries or illnesses, and Occupational Health & Safety Administration cases and fatalities at the HDP and USEI.

4. **Comment:** The Alternate Disposal Submittal provides an estimate of the amount of soil and debris that will be shipped to USEI but makes is no mention of the quantity of soil that is going to be removed.

Basis: The Alternate Disposal Submittal does not differentiate between soil and debris.

Path Forward: Provide an estimate of the amount of soil that will be shipped to USEI.

5. **Comment:** The Alternate Disposal Submittal makes is no mention of the actions that will be taken to protect surrounding areas from runoff.

Basis: The Alternate Disposal Submittal does not describe any of the environmental protective actions which will be taken when excavating the soil.

Path Forward: Provide the actions that will be taken to protect the surrounding areas from runoff.