

**REQUEST FOR ADDITIONAL INFORMATION
MATERIALS LICENSE NO. SNM-00033
HEMATITE FACILITY, DOCKET NO. 70-00036**

By application dated October 5, 2004, Westinghouse Electric Company (WEC) submitted an amendment request to the U.S. Nuclear Regulatory Commission (NRC) to amend Chapter 1 of Materials License No. SNM-00033, to authorize the dismantlement and demolition of the building complexes at the Hematite Facility, in Festus, Missouri. The requested information addresses the environmental monitoring program and its appropriateness for building dismantlement and at-grade building demolition activities. Each licensee shall develop, document, and implement a radiation protection program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of 10 CFR Part 20. The licensee must submit sufficient information to allow the staff to fully understand how the it will implement and conduct its effluent control program during dismantlement and demolition of the building complexes to grade at the Hematite Facility. For the proposed licensing request, the following information is needed to assure compliance with 10 CFR Part 20.1101. The staff used NUREG - 1748, "NRC: Environmental Review Guidance for Licensing Actions Associated with NMSS [Office of Nuclear Material Safety and Safeguards] Programs" to conduct its Environmental Assessment Evaluation and NUREG-1757, "Consolidated NMSS [Office of Nuclear Material Safety and Safeguards] Decommissioning Guidance," Volumes 1 and 2, to conduct its safety evaluation.

The following Requests for Additional Information (RAIs) specifically address the Environmental Monitoring Plan (EMP) with respect to building dismantlement and demolition proposed activities¹:

1. Page1-1, 2nd paragraph: "The current environmental monitoring program is based on the program established when the facility was a fully operating commercial nuclear fuel fabrication facility." Clarify this statement. For building dismantlement and decommissioning activities, NRC expects the EMP to be based on decommissioning activities and appropriately modify the established program. Consider the following when responding to this question: the potential hazards of the materials released, considering both expected quantities and relative radiotoxicities; the extent to which the facility operations (decommissioning) are routine and unchanging; the need for supplementing and complementing effluent monitoring; the size and distribution of the exposed population; the cost-effectiveness of increments to the environmental monitoring program; and the availability of measurement techniques that will provide sufficiently sensitive comparisons with applicable standards and background measurements.

2. Page 1-1, last sentence: Based on this sentence, It appears as if the scope of this monitoring plan only applies to soil remediation activities. Please clarify by describing other

¹Westinghouse has submitted its Decommission Plan (DP) and NRC is currently conducting its 90 day acceptance review. If accepted, staff will revisit the EMP during the detailed technical review to ensure that it is appropriate for those activities proposed in the DP license amendment request.

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activities that are applicable.

3. Page 1-2, 1st paragraph: Clarify the type of decontamination and decommissioning operations effects that are expected. Specifically, state what the potential radiological effects and potential non-radiological effects will be and why. For building dismantlement and demolition activities, estimate the expected nature and extent of residual contamination that is to be expected during this dismantlement and decommissioning activity and at the end of the activity.

4. Page 1-2, 1st paragraph: State the purpose of Environmental Monitoring. Please clarify the objectives. Is the evaluation of the effectiveness of operational controls specific to effluent levels and as low as reasonably achievable (ALARA) the only objective? It appears that the Environmental Monitoring Program is being conducted for various reasons, namely - to verify and support compliance with applicable NRC requirements and other federal and state requirements, such as to: establish baselines (decommissioning) and to continue to characterize trends in the physical, chemical, and biological condition of effluent and environmental media; identify potential environmental problems during operations/decommissioning and evaluate the need for measures to mitigate the problem; detect, characterize, and report unplanned releases; or determine compliance with commitments made in licensing documents.

5. Page 3-4, last paragraph: Identify the type and location of Environmental Monitoring Program implementing procedures that exist and/or will be developed. For each major measurement parameter, does Westinghouse plan on documenting and approving the design of sampling methodology, equipment, and procedures? Clarify how Westinghouse's Hematite Site quality assurance/quality control program relates to environmental monitoring specifically in the areas of: inclusion of specific sampling procedures to be used, either by reference in the case of approved standard operating procedures or in entirety if the procedures are nonstandard; sampling design; field sampling operations; laboratory operations; custody records; calibration procedures; preventative maintenance of equipment used for collection and measurement of environmental data; and data evaluation.

6. Page 4-5: Identify the radionuclides of concern for the Hematite site and the reason for this conclusion. What is the basis for assuming that uranium is the only significant isotope? Identify whether or not transuranic isotopes may be present and how they will contribute to the total weighted release fraction. If transuranics are present, please provide the activity ratios of the transuranics to uranium.

7. Page 4-5: Explain how the Hematite Environmental Monitoring Program will be used to demonstrate that the facility meets NRC dose limits to members of the public, particularly when all the effluent air point sources no longer exist and instead there are fugitive emissions from decommissioning operations. This question also applies to Page 8-34, Section 8.1.

8. Page 4-6, Table 4-1: Airborne Effluent Limits. The 10 mrem/year air emission limit includes fugitive emissions. How does Westinghouse plan on demonstrating compliance with this limit when all the effluent air point sources no longer exist and instead there are fugitive emissions from decommissioning operations? Also, this RAI applies to page 5-9 and page 6-15.

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9. Page 4-6, Table 4.1: The effluent control limits for gross alpha are based on the 10 CFR Part 20 effluent concentrations of uranium and not based on the more conservative concentration of Thorium (Th)-232. What is the basis of the assumption that Th-232 may only exist in the burial pits? Please justify that only the burial pits contain Th-232. If not, provide the activity ratio of Th-232 to uranium.
10. Page 5-7, Table 4-2: Clarify the unit of time for 25 mrem. Explain how compliance with other limits will ensure compliance with this limit.
11. Page 5-8: Clarify and identify which surface water runoff locations will be monitored during building demolition and other decommissioning activities.
12. Page 5-9: Provide the basis that dust controlled at less than the average limit of $150 \mu\text{g}/\text{m}^3$ level would lead to an airborne concentration of $1.5\text{E}-14 \mu\text{Ci}/\text{ml}$, which is 30% of the radiological effluent limit. Is the above conclusion based on the assumption of $100 \text{pCi}/\text{g}$ of the dust concentration? Please provide the uranium concentration profile of the dust and the basis for your assumption.
13. Resolve the discrepancy between the July 22, 2005 RAI response and the Hematite EMP with regard to the number and physical placement of air samplers. For example, on Page 5-10, Table 5-1: The air particulate frequency is inconsistent with Environmental Report for Building Demolition that was submitted as part of the license amendment application.
14. Page 5-10, Table 5-1: The radioactivity concentrations in soil, vegetation, and water are based on the gross alpha and gross beta. Specify the control limits or action levels for the concentrations of soil vegetation and water. For decommissioning activities, the control limits should be based on the allowable dose of 25 mrem per year to the general public. In order to determine the control limits, either modeling or isotopic analyses will be required. For activities covered under the Decommissioning Plan, the licensee is required to establish the control limits for the concentrations of soil vegetation and water based on the radioisotopes and their appropriate dose pathways.
15. Page 6-11: Provide justification for placement of the Hematite site perimeter air samplers. An acceptable methodology would consider such factors as the site's prevailing wind direction, and the distance to local population centers.
16. Page 6-11 and page 6-12: Justify the applicability of regional meteorological data to the Hematite site with due consideration of local terrain effects, and then justify the correct placement of the perimeter air samplers.
17. Page 6-14: Clarify the purpose of using upwind and downwind air samplers in relationship to background.
18. Page 6-12, last paragraph: Reference the source of the predominant wind direction. Explain why the words "should be" are used versus "will be."

19. Page 6-14: Work control sampling. The licensee should establish the action level for the work control sampling to prevent the weekly effluent concentration exceeding the control limit.

20. Page 6-15: Clarify when the stack samples will be collected. On page 6-15 it is stated that these samples will be collected daily; however this is inconsistent with the sampling frequency stated on page 6-30. Please resolve the discrepancy.

21. Pages 6-16, 6-17, 6-26, 6-27, and 8-33: Explain why Westinghouse is using the word "should" vs. "will be" (soil sampling, sediment, vegetation, monitoring wells, ALARA goals). Also, what does Westinghouse consider the "normal" concentration to be for each environmental sample matrix?

22. Page 6-16, Table 6-2: The units of the historic soil sampling results are in pCi/g. Clarify this table in terms of the radionuclides of concern.

23. Page 6-19: Identify which sampling points in Table 6-3 are used for dose compliance.

24. Page 6-32: Define the other "methods and formula" that "may also be used" or delete the sentence.

25. Page 6-32: Define, reference, or make a commitment that you will define the "constraint or limit" for each "analytical media" before it is analyzed in the laboratory.

26. Page 8-33, Section 7: It is stated that "The data collected will be plotted to facilitate the assessment of trends and measure against the facility ALARA goals." Explain how your ALARA goal applies to building demolition activities.

27. Page 6-21, Section 6.4.3: Weir Sampling. Please show in a separate figure, or sketch the relative locations of, the siphon tank, the small 30⁰ V-notch weir feeding the siphon tank, the siphon tank and the site dam with its six (6) 120⁰ V-notch weirs. The figure or sketch may start from an upstream point and end at a downstream point of the system. Also, please explain the function of the two 30-gallon composite collection drums and their relationships to the weirs and the siphon tank system. The water flow system information is not clear from the descriptions.

28. Page 6-23: The equation for the rate of water flow through the V-notch weir has a constant K. Please show the weir coefficients used and the calculations for obtaining the values of K=0.4369 and K=2.798 for the two weirs. The relationship $Q_{Dam} = (38.43) Q_{siphon}$ is not clear. Please explain the purpose of this ratio in the flow system.

29. Page 6-24: Please provide the method for arriving at the equation:

$$Q = K (L - 0.2H) H^{1.5} (0.6463) \text{ and justify the use of } K = 3.33.$$

Also, please provide reference for K = 3.33. The constant in the beginning of the second line from the bottom of Page 6-24 should be 0.6463, not 0.06463. Please confirm this.

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30. Page 6-16, Table 6-2: For subsurface decommissioning activities, explain how this relates to the significant radionuclides that WEC has/will identify in its Decommissioning Plan?
31. Page 6-17: Explain why other sediments on site will be addressed as part of the decommissioning and do not warrant routine sampling.
32. Page 6-19: WS-4: Well water collected at the Post Office. Explain why WEC believes this location is representative of a resident drinking water well considering the direction of the flow of groundwater.
33. Page 6-19: Identify the sampling points on Table 6-3 that are used for dose compliance. Reference the procedure(s) used to determine compliance.
34. Page 6-26: Provide a geological stratigraphic cross section and indicate the direction of flow of groundwater.
35. Page 6-30, Section 6.6.3: Identify which monitoring wells are being used for environmental radioactivity sampling. Delete or explain the word "recommended." Provide the rationale for well location.
36. Page 6-32: Define or reference the "constraint or limit" for each "analytical media."
37. Page 8-35, Section 8.3: Clarify what is meant by "consideration of appropriate dose pathways will be made."
38. Page 5-7, Section 5: Environmental Pathways. Please provide the key criteria of the National Pollution Discharge Elimination System (NPDES) Permit as it applies to this site.
39. Page 5-7, Section 5.1: Sanitary Waste. Please include a copy of the NPDES Permit in the Appendix of this EMP.
40. Page 5-7: Please clarify the purpose of feeding the system dog food to bridge low use periods.
41. Page 6-26, Section 6.6.1: Ground Water Characteristics. Please provide typical geological cross-sections through the site showing various geologic features, soil boring and well locations, ground water contour map, water table elevations, flow directions, hydraulic conductivity, porosity and other geo-hydrological parameters.
42. The flow directions are given as southeastward and northeast. Please provide the basis for these flow directions. Ground water flow velocity is estimated to range between 20 and 300 ft/year. Please provide calculations including the parameters used for these flow velocities.
43. Page 6-27: Is the ^{99}Tc concentration in ground water below the regulatory criteria? Please provide the concentration values. It is stated that the preliminary conclusions from the Draft RI (Remedial Investigation) Report is that the extent of the uranium contamination in ground water is limited. What is the current uranium contamination in ground water?

44. Page 6-27, Section 6.6: Proposed Monitoring Wells for Sampling. Please provide a drawing showing a typical configuration of a monitoring well. Provide a list of monitoring wells that are installed and used for environmental radioactivity sampling purposes. It is stated that the (ground water) sample results that are 3 times the normal concentration should be evaluated to determine the cause (of the increase) and corrective action taken if needed. Please explain "normal concentration" and give an example. Did WEC find any sample that is greater than 3 times the normal concentration? Will this continue to be tracked under the current program? Also, please provide the values for the ground water sample results including the frequency of sampling.