Westinghouse Electric Company LLC
Hematite Decommissioning Project
3300 State Road P
Festus, MO 63028
USA

ATTN: Document Control Desk
Director, Office of Federal and State Materials and
Environmental Management Programs
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Direct tel: 314-810-3368
Direct fax: 636-937-6380
E-mail: copprd@westinghouse.com
Our ref: HEM-12-26
Date: February 27, 2012

ATTN: A. T. McCraw
U.S. Nuclear Regulatory Commission, Region III
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4352

Subject: HEMATITE EFFLUENT MONITORING REPORT FOR THE PERIOD JULY 1, 2011 THROUGH DECEMBER 31, 2011 (LICENSE NO. SNM-33, DOCKET NO. 70-36)

Reference: 10 CFR 70.59, "Effluent monitoring reporting requirements"

Dear Sirs:

In accordance with 10 CFR 70.59, this letter transmits the effluent monitoring report for Hematite Decommissioning Project (Hematite), License Number SNM-33. The report, provided as an attachment to this letter, covers the period July 1, 2011 through December 31, 2011.

If you have any questions concerning this letter or the attached report, please contact Gerald Rood, Project Radiation Safety Officer, at (314) 810-3382.

Respectfully,

Robert D. Copp
Director, Hematite Decommissioning Project

Attachment: Hematite Decommissioning Project Effluent Monitoring Report for the Period July 1, 2011 Through December 31, 2011

cc: J. J. Hayes, NRC/FSME/DWMEP/DURLD
E. J. Gilstrap, MDNR
M. M. Lafranzo, R-III/DNMS/MCID
P. Michalak, NRC/FSME/DWMEP/DURLD/MD

ATTACHMENT

Hematite Decommissioning Project Effluent Monitoring Report
For the Period July 1, 2011 Through December 31, 2011

Hematite Decommissioning Project Effluent Monitoring Report For the Period July 1, 2011, Through December 31, 2011

I. Introduction

Pursuant to 10 CFR 70.59, this report summarizes the results of radiological effluent monitoring at the Hematite Decommissioning Project for the period from July 1, 2011, through December 31, 2011. This report includes the information specified in 10 CFR 70.59, which states in part:

> *The report must specify the quantity of each of the principal radionuclides released to unrestricted areas in liquid and gaseous effluents during the previous six months of operation, and such other information as the Commission may require to estimate maximum potential annual radiation doses to the public resulting from effluent releases. If quantities of radioactive materials released during the reporting periods are significantly above the licensee's design objectives previously reviewed as part of the licensing action, the report must cover this specifically.*

II. Effluent Monitoring Report

A. Liquid Effluents

The quantity of radioactivity released to unrestricted areas in liquid effluents from July 1, 2011, through December 31, 2011, is summarized in Table 1 below.

As indicated in Table 1, quantities of radioactive materials released during the reporting period are significantly below the control limits specified by the Hematite Decommissioning Project License Number SNM-33. Based on the gross activity measurements, the maximum average activity concentration at an individual outfall location was 13% of the annual effluent limit (based on Outfall #001 Sewage Treatment). This data confirms that the maximum potential radiation dose to the public resulting from liquid effluent releases during the reporting period is below the limits of 10 CFR 20.1301.

Table 1
Liquid Effluent Monitoring Summary Data
Reporting Period July - December, 2011

Table 1a - Average Concentrations and Quantity Released for the Monitoring Period

	Total Volume (L)	Average Activity Concentration (µCi/ml)	Analytical Uncertainty Estimate (µCi/ml)	LLD[1] (µCi/ml)	Fraction of Limit[5]	Quantity Released[2] (Ci)	Total Uncertainty Estimate[3] (Ci)
Sewage Treatment (Outfall #001)							
Gross Alpha	1.4E+06	3.4E-08	7.1E-09	5.4E-09	1.3E-01	4.6E-05	2.9E-06
Gross Beta	1.4E+06	6.6E-08	8.0E-09	3.5E-09	2.9E-02	9.0E-05	3.4E-06
Site Dam (Outfall #002)							
Gross Alpha	1.5E+08	5.8E-09	2.2E-09	3.5E-09	2.2E-02	9.0E-04	1.1E-04
Gross Beta	1.5E+08	6.8E-09	1.5E-09	2.4E-09	3.0E-03	1.1E-03	7.6E-05
Water Treatment System (Outfall #003a)							
Gross Alpha	1.0E+05	6.2E-09	3.8E-09	4.1E-09	2.3E-02	6.2E-07	3.4E-07
Gross Beta	1.0E+05	1.1E-08	2.7E-09	2.5E-09	4.9E-03	1.1E-06	2.0E-07
East Culvert (Outfall #004)[4]							
Gross Alpha	1.3E+05	2.4E-08	4.7E-09	2.7E-09	9.0E-02	3.2E-06	4.1E-07
Gross Beta	1.3E+05	7.4E-08	8.3E-09	1.6E-09	3.2E-02	9.8E-06	9.3E-07
South Culvert (Outfall #005)							
Gross Alpha	No Flow		N/A				
Gross Beta	No Flow		N/A				
Soil Laydown Area (Outfall #006)[4]							
Gross Alpha	5.3E+08	2.6E-09	2.3E-09	3.1E-09	9.6E-03	1.4E-03	6.6E-04
Gross Beta	5.3E+08	4.0E-09	1.6E-09	2.0E-09	1.8E-03	2.1E-03	5.0E-04

Table 1a Notes

Note 1: The lower level of detection (LLD) was calculated by averaging the LLD for all samples.

Note 2: The total quantity of gross alpha radioactivity is assumed to be due to uranium, the principal radionuclide at the Hematite Decommissioning Project.

Note 3: The total uncertainty includes the cumulative uncertainties from the analytical and the volumetric measurements.

Note 4: Storm water that collects in the former process building loading dock was sampled and released to Outfalls #004 and #006. The average concentration includes the storm water discharge to these outfalls.

Note 5: With License Amendment 57, the gross alpha and beta effluent limits changed during this reporting period. The most restrictive limit between Amendments 56 and 57 were used. License Amendments 58 and 59 did not change the effluent limits.

Table 1b - Maximum Concentrations for the Monitoring Period[1]

	Activity Concentration (µCi/ml)	Analytical Uncertainty Estimate (µCi/ml)	LLD (µCi/ml)	Fraction of Limit[4]
Sewage Treatment Outfall (Outfall #001)[5]				
Gross Alpha	3.4E-07	4.6E-08	1.8E-08	1.3E+00
Gross Beta	1.1E-07	1.2E-08	2.0E-09	4.7E-02
U-233/234	3.3E-07	2.8E-08	7.0E-11	1.1E+00
U-235	1.5E-08	1.8E-09	1.0E-10	4.9E-02
U-238	4.5E-08	4.3E-09	1.0E-10	1.5E-01
Site Dam (Outfall #002)[2]				
Gross Alpha	3.3E-08	6.7E-09	2.9E-09	1.2E-01
Gross Beta	3.0E-08	4.3E-09	2.4E-09	1.3E-02
Water Treatment System (Outfall #003a)[3]				
Gross Alpha	8.3E-09	4.8E-09	6.1E-09	3.1E-02
Gross Beta	2.4E-08	2.6E-09	1.2E-09	1.0E-02
U-233/234	1.6E-09	3.5E-10	9.0E-11	5.4E-03
U-235	2.0E-11	4.0E-11	5.5E-11	6.7E-05
U-238	3.2E-10	1.5E-10	7.0E-11	1.1E-03
Tc-99	3.0E-09	1.2E-09	1.8E-09	5.0E-05
East Culvert (Outfall #004)				
Gross Alpha	3.3E-08	4.6E-09	2.0E-09	1.2E-01
Gross Beta	1.7E-07	1.8E-08	2.0E-09	7.3E-02
U-233/234	2.3E-08	2.2E-09	9.0E-11	7.5E-02
U-235	6.7E-10	2.4E-10	9.0E-11	2.2E-03
U-238	2.5E-09	4.6E-10	1.0E-10	8.3E-03
South Culvert (Outfall #005)				
No Flow				
Soil Laydown Area (Outfall #006)[2]				
Gross Alpha	6.4E-08	8.5E-09	1.1E-09	2.4E-01
Gross Beta	2.6E-08	3.4E-09	1.9E-09	1.1E-02

Table 1b Notes

Note 1: Prior to approval of the Decommissioning Plan (SNM-33) in October 2011, isotopic analysis was performed when the gross alpha or gross beta concentration for an individual sample exceeded 10 percent of the annual effluent limit, consistent with Regulatory Guide 4.16 in consideration of the operational knowledge regarding the radionuclide composition. After approval of the Decommissioning Plan in October 2011, isotopic analysis was performed when the gross alpha or gross beta concentration for an individual sample exceeded 50 percent of the annual effluent limit, consistent with the Decommissioning Plan.

Note 2: Isotopic analysis was not performed since no individual sample concentration from this location exceeded 10 percent of the annual effluent limit prior to Decommissioning Plan approval in October 2011, or 50 percent of the annual effluent limit after Decommissioning Plan approval in October 2011.

Note 3: Samples from the water treatment system were analyzed for isotopic uranium and Tc-99 although no individual sample concentration exceeded 10 percent of the annual effluent limit.

Note 4: With License Amendment 57, the gross alpha and beta effluent limits changed during this reporting period. The most restrictive limit between Amendments 56 and 57 were used. License Amendments 58 and 59 did not change the effluent limits.

Note 5: During this reporting period, one weekly sample collected at Outfall #001 exceeded the annual effluent limit for gross alpha and U-233/234. This single elevated sample result was investigated. There were limited work activities during the week when the sample was collected, none which would likely cause an increase in the gross alpha or uranium concentration at this Outfall #001. Samples collected in the weeks prior to and after this sample were consistent with the historical average and well below the annual effluent limit. As shown in Table 1, the average gross alpha concentration for the reporting period was 13 percent of the annual effluent limit. This sample result appears to be an isolated event. Since the ALARA goal and effluent limits are based on annual results and not individual sample results, this elevated sample did not cause an exceedance of either the goal or limit.

B. Gaseous (Airborne) Effluents

Eight stationary environmental air samplers are located along the site boundary. The data obtained from the samplers are used to measure the air effluents, to determine the annual average concentration from air effluents, and to demonstrate that an individual member of the public likely to receive the highest dose would not be expected to receive a total effective dose equivalent in excess of 10 mrem per year from air effluents. These results indicate that the average air concentrations at the site boundary are not distinguishable from background. The results are presented in Table 2.

Table 2
Air Effluent and Environmental Monitoring Program Summary Data
(Reporting Period July - December 2011)

Environmental Monitoring Location	Analyte	Activity Concentration[1] (µCi/mL)	Analytical Uncertainty Estimate (µCi/mL)	LLD[2] (µCi/mL)	Fraction of the Limit[3,5]
Air Sample-1	Alpha	1.7E-15	1.6E-15	2.0E-15	3.4E-02
	Beta	2.7E-14	3.8E-15	3.3E-15	2.8E-04
	Uranium	5.9E-17	5.0E-17	4.6E-17	1.2E-03
	Tc-99	7.9E-17	2.0E-15	3.3E-15	8.8E-08
	Th-232	7.4E-18	1.3E-17	4.1E-17	1.2E-03
	Ra-226	3.5E-16	2.3E-16	3.0E-16	3.9E-04
Air Sample-2	Alpha	1.3E-15	1.6E-15	2.0E-15	2.5E-02
	Beta	2.0E-14	3.5E-15	3.4E-15	2.0E-04
	Uranium	3.1E-17	4.4E-17	6.5E-17	6.2E-04
	Tc-99	0.0E+00	2.1E-15	3.7E-15	0.0E+00
	Th-232	1.8E-18	1.2E-17	3.7E-17	3.0E-04
	Ra-226	2.1E-16	2.3E-16	3.6E-16	2.3E-04
Air Sample-3	Alpha	1.5E-15	1.6E-15	1.9E-15	3.0E-02
	Beta	2.3E-14	3.6E-15	3.3E-15	2.3E-04
	Uranium	1.8E-16	1.1E-16	8.7E-17	3.7E-03
	Tc-99	0.0E+00	1.8E-15	3.3E-15	0.0E+00
	Th-232	0.0E+00	1.4E-17	6.8E-17	0.0E+00
	Ra-226	2.4E-16	2.5E-16	3.9E-16	2.6E-04

Environmental Monitoring Location	Analyte	Activity Concentration[1] (µCi/mL)	Analytical Uncertainty Estimate (µCi/mL)	LLD[2] (µCi/mL)	Fraction of the Limit[3,5]
Air Sample-4	Alpha	1.4E-15	1.6E-15	1.9E-15	2.9E-02
	Beta	2.1E-14	3.5E-15	3.2E-15	2.2E-04
	Uranium	6.8E-17	6.9E-17	8.9E-17	1.4E-03
	Tc-99	0.0E+00	2.0E-15	3.5E-15	0.0E+00
	Th-232	1.4E-17	2.4E-17	4.0E-17	2.3E-03
	Ra-226	1.7E-16	2.1E-16	3.4E-16	1.9E-04
Air Sample-5 (bkg)[4]	Alpha	1.4E-15	1.6E-15	2.0E-15	2.7E-02
	Beta	3.1E-14	3.9E-15	3.3E-15	3.2E-04
	Uranium	6.7E-17	5.7E-17	5.1E-17	1.3E-03
	Tc-99	0.0E+00	2.1E-15	3.6E-15	0.0E+00
	Th-232	0.0E+00	5.5E-18	4.7E-17	0.0E+00
	Ra-226	1.9E-16	2.2E-16	3.6E-16	2.1E-04
Air Sample-6	Alpha	1.2E-15	1.5E-15	1.9E-15	2.4E-02
	Beta	2.2E-14	3.5E-15	3.2E-15	2.3E-04
	Uranium	8.4E-17	6.4E-17	5.5E-17	1.7E-03
	Tc-99	0.0E+00	3.0E-15	5.6E-15	0.0E+00
	Th-232	0.0E+00	1.2E-17	5.2E-17	0.0E+00
	Ra-226	3.1E-16	3.4E-16	5.8E-16	3.5E-04
Air Sample-7	Alpha	1.1E-15	1.5E-15	1.9E-15	2.2E-02
	Beta	2.2E-14	3.5E-15	3.2E-15	2.3E-04
	Uranium	7.6E-17	7.1E-17	7.9E-17	1.5E-03
	Tc-99	0.0E+00	2.9E-15	5.2E-15	0.0E+00
	Th-232	4.4E-18	2.1E-17	5.4E-17	7.4E-04
	Ra-226	1.1E-16	3.2E-16	5.7E-16	1.2E-04
Air Sample-8	Alpha	1.3E-15	1.5E-15	1.9E-15	2.7E-02
	Beta	2.3E-14	3.6E-15	3.2E-15	2.4E-04
	Uranium	1.1E-16	7.7E-17	7.1E-17	2.1E-03
	Tc-99	0.0E+00	3.2E-15	5.6E-15	0.0E+00
	Th-232	5.7E-18	1.4E-17	3.8E-17	9.4E-04
	Ra-226	2.8E-16	3.9E-16	6.5E-16	3.2E-04
Air Sample-9	Alpha	9.2E-16	1.5E-15	1.8E-15	1.8E-02
	Beta	1.9E-14	3.3E-15	3.2E-15	1.9E-04
	Uranium	2.1E-16	1.6E-16	1.2E-16	4.2E-03
	Tc-99	0.0E+00	2.4E-15	4.3E-15	0.0E+00
	Th-232	0.0E+00	1.5E-17	1.4E-16	0.0E+00
	Ra-226	2.9E-16	3.4E-16	5.3E-16	3.2E-04

Note 1: Average sample results are reported at each fixed location during the monitoring period

Note 2: The LLD was calculated by averaging the LLD for all samples.

Note 3: Consistent with the guidance provided in Regulatory Guide 4.20, the average environmental sample result demonstrates that an individual member of the public did not receive a TEDE in excess of 10 mrem as the result is less than 20% of the values in 10 CFR 20 Appendix B Table 2 Column 1.

Note 4: Air sample-5 is located at an offsite location to assess background concentrations.

Note 5: With License Amendment 57, the gross beta effluent limit changed during this reporting period. The most restrictive limit between Amendments 56 and 57 was used. License Amendments 58 and 59 did not change the effluent limit.

III. Conclusion

The effluent monitoring results summarized above confirm that quantities of radioactive materials released from Hematite in liquid and air effluents during the reporting period are significantly below License limits for liquid and gaseous effluents. Thus, the maximum potential radiation dose to the public resulting from liquid and air effluent releases during the reporting period is well below the limits of 10 CFR 20.1301 and 10 CFR 20.1101(d).