UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE RD. SUITE 210
LISLE, IL 60532-4352

June 20, 2016

Ms. Gay Fussell, Deputy Director
Hematite Decommissioning Project
Westinghouse Electric Company
3300 State Road P
Festus, MO 63028

SUBJECT: NRC INSPECTION REPORT 07000036/2015004(DNMS) WESTINGHOUSE ELECTRIC COMPANY (HEMATITE) AND NOTICE OF VIOLATION

Dear Ms. Fussell:

On May 6, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Westinghouse Hematite facility located in Festus, Missouri. The purpose of the inspection was to determine whether decommissioning activities were conducted safely and in accordance with NRC requirements. Specifically, the inspection focused on radiation protection, closeout inspection and surveys, and environmental protection. The enclosed report presents the results of this inspection, which were discussed with you and other members of your staff during an exit teleconference on May 6, 2016.

This inspection examined activities conducted under your license as they relate to public health and safety and to confirm compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The violation was evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's website at http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html. The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because it was identified by the NRC.

The NRC has concluded that information regarding: (1) the reason for the violation; (2) the corrective actions that have been taken and the results achieved; and (3) the date when full compliance was achieved is already adequately addressed on the docket in your letter dated December 23, 2015 (ADAMS Accession No. ML15357A074). Therefore, you are not required to respond to this letter unless the description herein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

The violation is the second example we have identified in recent inspections of the failure of one of your technicians to follow procedure requirements for properly surveying areas for contamination. These instances of improper surveys by your technicians could likely explain the number of areas of elevated contamination we have identified as part of our confirmatory

surveys and which your surveys did not identify. Although you have indicated in your letter to us dated April 20, 2016 (ML16082A107) that you consider the radiological remediation of the site complete, there remains NRC regional inspection activities and NRC headquarters review of Final Status Survey reports that may require additional surveys by you and which would need to be conducted by trained personnel following approved, current procedures.

In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC's Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC's website at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

Sincerely,

/RA/

Michael A. Kunowski, Chief
Materials Control, ISFSI and
Decommissioning Branch
Division of Nuclear Materials Safety

Docket No. 070-00036
License No. SNM-00033

Enclosures:
1. Notice of Violation
2. IR 07000036/2015004(DNMS)

cc w/encl: Hematite Service List

surveys and which your surveys did not identify. Although you have indicated in your letter to us dated April 20, 2016 (ML16082A107) that you consider the radiological remediation of the site complete, there remains NRC regional inspection activities and NRC headquarters review of Final Status Survey reports that may require additional surveys by you and which would need to be conducted by trained personnel following approved, current procedures.

In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC's Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC's website at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

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cc w/encl: Hematite Service List

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NOTICE OF VIOLATION

Westinghouse Electric Company (Hematite) Docket No. 070-00036
Festus, Missouri License No. SNM-00033

During an U.S. Nuclear Regulatory Commission (NRC) inspection conducted from October 16, 2015, to May 6, 2016, one violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

> Condition 9 of License SNM-00033 states, in part, that the authorized uses of licensed material are as described in the August 12, 2009, Decommissioning Plan (DP) and associated supporting documents noted in the Hematite DP Safety Evaluation Report (ML112101630).
>
> Section 13.0, "QUALITY ASSURANCE," of the DP states, in part, that program requirements shall be adhered to in the performance of activities covered by the Hematite Project Quality Plan (Westinghouse Electric Company Document No. HDP-PO-QA-001, "Project Quality Plan (PQP))," that work performed by or for the decommissioning of the Hematite facility shall comply with the PQP, and that all Hematite personnel are responsible for implementing procedures required by the PQP.
>
> Section 12, "INSTRUCTIONS, PROCEDURES AND DRAWINGS," of the PQP states, in part, that activities affecting quality are prescribed by and performed in accordance with documented policies, procedures, plans, and/or drawings of a type appropriate to the circumstance.
>
> Section 2.0, "MODELING AND CALCULATION," of HDP-TBD-FSS-003, "Modeling and Calculation of Investigative Action Levels for Final Status Soil Survey Units," Revision 1, an implementing procedure of the PQP, states, in part, that the instructions given to Final Status Survey (FSS) technicians are to survey as close as possible to the ground surface (nominally one inch, but not to exceed three inches distance from the surface).
>
> Section 6.6 of HDP-PO-FSS-700, "Final Status Survey Program," Revision 5, an implementing procedure of the PQP, states, in part, that technicians are responsible for performing and documenting FSSs in accordance with the applicable site procedures and survey package instruments.
>
> Contrary to the above, on December 15, 2015, the NRC inspectors identified that a technician did not conduct an FSS in Land Survey Unit (LSA) 08-01 in accordance with applicable site procedures appropriate to the circumstance. Specifically, the technician conducted the survey with the survey instrument probe exceeding three inches distance from the soil surface.

This is a Severity Level IV violation (Section 6.3).

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance will be (was) achieved, is already adequately addressed on the docket in letter from the licensee dated December 23, 2015 (ML15357A074). However, you are required to

submit a written statement or explanation pursuant to Title 10 of the *Code of Federal Regulations (*CFR) 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region III, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

If you choose to respond, your response will be made available electronically for public inspection in the NRC's Public Document Room or in the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC's website at http://www.nrc.gov/reading-rm/adams.html. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 20th day of June, 2016.

U.S. NUCLEAR REGULATORY COMMISSION
REGION III

Docket No.:	07000036
License No.:	SNM-00033
Report No.:	07000036/2015004(DNMS)
License:	Westinghouse Electric Company, LLC
Facility:	Former Hematite Fuel Manufacturing Facility
Location:	3300 State Road P Festus, Missouri
Inspection Period:	October 16, 2015, through May 6, 2016
NRC Inspectors:	Michael M. LaFranzo, Senior Health Physicist Eugenio A. Bonano, Health Physicist Dr. Peter J. Lee, Health Physicist, CHP Daniel C. Strohmeyer, Health Physicist, CHP
Approved By:	Michael A. Kunowski, Chief Materials Control, ISFSI, and Decommissioning Branch Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

Westinghouse Electric Company, LLC
Hematite Fuel Manufacturing Facility (Decommissioning)
NRC Inspection Report 07000036/2015004(DNMS)

Radiation Protection

The NRC did not identify any significant deficiencies in the licensee's personnel radiological safety or general area radiological conditions during this inspection period. (Section 1.0)

Closeout Inspection and Survey

The NRC determined that the licensee failed to follow its procedural requirements to survey as close as possible to the ground surface (nominally one inch, but not to exceed three inches distance) during a FSS of LSA 08-01 (VIO 07000036/2015004-001). The NRC determined that the examples of violations of NRC requirements and examples of not identifying detectable quantities of radiological contamination as noted in this report calls into question whether the licensee is in compliance with the As Low As is Reasonably Achievable (ALARA) concept as required by 10 CFR 20.1402 (URI 07000036/2015004-001). (Section 2.1)

The NRC is continuing to review the licensee's compliance with the reclassification of survey areas (URI 07000036/2015004-002). (Section 2.2)

The NRC is continuing to review the licensee's corrective actions associated with violations 07000036/2015003-001, 07000036/2015003-002 and 07000036/2015003-003. The NRC is also continuing to review the licensee's response to the NRC's request for the results of an extent-of-condition review. The NRC considers violation 07000036/2015003-004 closed. (Section 2.3)

The inspectors concluded that decommissioning activities continued to be conducted in accordance with the NRC license, approved DP, work plans, procedures, and NRC regulations. However, the NRC noted a number of examples during confirmatory surveys of the licensee not identifying detectable quantities of radiological contamination. (Section 2.4)

The NRC considers IFI 07000036/2015001 closed. (Section 2.5)

Environmental Protection

The inspectors concluded that the licensee conducted the quarterly groundwater sampling and well monitoring installation in accordance with its procedures. (Section 3.1)

One violation of minor significance was identified which is not subject to formal enforcement action. (Section 3.2)

1.0 Radiation Protection (Inspection Procedure 83822)

a. Inspection Scope

The inspectors performed site tours and observed licensee activities associated with personnel radiological surveys. The inspectors interviewed licensee staff and technicians involved in personnel radiation protection activities to determine compliance with NRC requirements.

b. Observations and Findings

The licensee's total source term had been significantly reduced following the completion of remediation activities in the burial pits and other Class 1 survey unit areas and the shipment of that material offsite for ultimate radioactive waste disposal.

The inspectors observed personnel health physics practices, such as personnel radiological surveys, donning and doffing personnel protective gear, and handling of potential contaminated soil and other material for radiological analysis and ultimate disposal.

The NRC also performed independent surveys, which did not include surveys performed as part of NRC's confirmatory survey program, and did not identify any significant radiological contamination or radiation levels.

No findings of significance were identified.

c. Conclusions

The NRC did not identify any significant deficiencies in the licensee's personnel radiological safety or general area radiological conditions during this inspection period.

2.0 Closeout Inspection and Survey (83890)

2.1 Final Status Surveys – Gamma Walkover

a. Inspection Scope

The inspectors reviewed the licensee's Gamma Walkover Survey (GWS) program to determine whether the licensee's actions were in compliance with NRC requirements.

b. Observation and Findings

During the inspection on December 15, 2015, the inspectors observed that during Final Status Surveys (FSSs) being performed in Land Survey Area (LSA) 08-01, the technician performing a gamma walkover survey was traversing an area with a survey meter and the height of the probe did not appear to be 3 inches or less from the soil. The inspectors took a photo of the survey technique and immediately notified licensee management who agreed that the survey distance was not 3 inches or less from the soil.

Condition 9 of License SNM-00033 states, in part, that the authorized usage of licensed material is described in the August 12, 2009, Decommissioning Plan (DP) and associated supporting documents noted in Hematite DP Safety Evaluation Report (ML112101630).

Section 13.0, "QUALITY ASSURANCE" of the DP states, in part, that program requirements shall be adhered to in the performance of activities covered by the Hematite Project Quality Plan (Westinghouse Electric Company Document No. HDP-PO-QA-001, Project Quality Plan (PQP)), that work performed by or for the decommissioning of the Hematite facility shall comply with the PQP, and that all Hematite personnel are responsible for implementing procedures required by the PQP.

Section 12, "INSTRUCTIONS PROCEDURES AND DRAWINGS," of the PQP states, in part, that activities affecting quality are prescribed by and performed in accordance with documented policies, procedures, plans, and/or drawings of a type appropriate to the circumstance.

Section 2.0, "MODELING AND CALCULATION," of HDP-TBD-FSS-003, "Modeling and Calculation of Investigative Action Levels for Final Status Soil Survey Units," Revision 1, an implementing procedure of the PQP, states, in part, that the instructions given to Final Status Survey (FSS) technicians are to survey as close as possible to the ground surface (nominally one inch, but not to exceed three inches distance from the surface).

Section 6.6 of HDP-PO-FSS-700, "Final Status Survey Program," Revision 5, states, in part, that health physics technicians are responsible for performing and documenting FSSs in accordance with the applicable site procedures and survey package instruments.

Contrary to the above, on December 15, 2015, the NRC inspectors identified that a technician did not conduct an FSS survey in Land Survey Unit (LSA) 08-01 in accordance with applicable site procedures appropriate to the circumstance. Specifically, the technician conducted the survey with survey instrument probe exceeding three inches distance from the soil surface.

Failure to survey as close as possible to the ground surface (nominally one inch, but not to exceed three inches distance from the surface) is a violation of NRC requirements (VIO 07000036/2015004-001).

As part of the licensee's corrective actions taken that same day, the licensee issued a Stop Work Order for the FSS process until such time as a preliminary root cause and corrective actions could be identified/taken. The licensee continued the stop work order until individuals were appropriately trained and other corrective actions could be taken. The licensee responded to the potential violation and documented the corrective actions in a letter dated December 23, 2015 (ML15357A074).

This is the second violation of a similar nature to occur during an NRC review of the licensee Final Status Survey program, see Section 2.2 for details on the first instance identified and documented in IR 07000036/2015003(DNMS). In addition, the NRC identified a number of examples during confirmatory surveys of the licensee not identifying detectable quantities of radiological contamination at noted in Section 2.4 of this report. The inspectors noted that this calls into question whether the licensee

is in compliance with the ALARA concept as required by 10 CFR 20.1402 (URI 07000036/2015004-001). The NRC will continue to monitor and evaluate the licensee's performance.

c. Conclusions

The NRC determined that the licensee failed to follow its procedural requirements to survey as close as possible to the ground surface (nominally one inch, but not to exceed three inches distance) during a FSS of LSA 08-01 (VIO 07000036/2015004-001).

The NRC determined that the examples of violations of NRC requirements and examples of not identifying detectable quantities of radiological contamination as noted in this report calls into question whether the licensee is in compliance with the ALARA concept as required by 10 CFR 20.1402 (URI 07000036/2015004-001).

2.2 Underground Piping Survey

a. Inspection Scope

The inspectors reviewed the licensee's radiological survey program related to underground piping to determine whether the licensee's actions were in compliance with NRC requirements.

b. Observation and Findings

During the inspection, the inspectors reviewed underground piping radiological surveys program and procedures. Although a confirmatory survey could not be performed by the NRC because of inclement weather, the inspectors identified that within the DP (ML092330132), Table 14-16 denotes the storm drain system, septic treatment system, and building drain system in buildings 110 and 230 as an initial MARSSIM Class 1 survey area.

On July 3, 2012, the licensee submitted letter HEM-12-73 which requested the NRC review and approve a final status survey plan for underground piping through procedure HDP-PO-FSS-800, Revision 0 (ML12187A121). The NRC sent a response letter dated April 5, 2013 (ML13031A452). In that letter, the NRC indicated that the proposed plan appeared to provide a reasonable path forward but that the review and comment did not equate to an automatic approval of the overall final status survey results.

Table 14-17 of the DP states, in part, that an Area Classification of 1 requires a scan coverage of 100 percent.

Section 14.4.3.6, "Remediation And Reclassification," requires, in part, that reclassification of a survey unit from a more restrictive classification to a less restrictive classification requires prior NRC approval.

The inspectors noted that the licensee has performed radiological surveys of underground piping and that such surveys did not possess a scan coverage of 100 percent. However, the NRC has not received FSS reports of any underground piping during the inspection.

The licensee contends that: (1) the letter from the NRC dated April 5, 2013, provided approval for changing the Class 1 underground piping classification to Class 3; and (2) there was sufficient documentation in the possession of the licensee to demonstrate the certain portions of the underground piping could be Class 3.

At this time, the inspectors do not have sufficient information to demonstrate a violation of NRC requirements had occurred. Specifically, the issue is that the licensee had reclassified Class 1 areas to Class 3 areas without NRC approval. The NRC will continue to review whether the licensee had, indeed, reclassified Class 1 areas to Class 3 areas without NRC approval during a future inspection (URI 07000036/2015004-002).

No findings of significance were identified.

c. Conclusions

The NRC is continuing to review the licensee's compliance with the reclassification of survey areas (URI 07000036/2015004-002).

2.3 Inspection Report (IR) 07000036/2015003(DNMS) Violations and Extent-of-Condition

a. Inspection Scope

The inspectors determined whether the corrective actions for violations documented in IR 07000036/2015003(DNMS) were adequate. The inspectors also reviewed the licensee's response to an associated request by the NRC for the results of an extent-of-condition evaluation.

b. Observations and Findings

On November 27, 2015, NRC issued IR 07000036/2015003(DNMS) (ML15334A404) which transmitted a Notice of Violation documenting four violations of NRC requirements.

On December 23, 2015, the licensee responded to the Notice of Violation in a letter (ML15357A074) and contested violations 07000036/2015003-001, 07000036/2015003-002 and 07000036/2015-003. The licensee accepted violation 07000036/2015003-004 and provided corrective actions.

On January 19, 2016, the NRC issued a letter (ML16020A093) acknowledging the licensee's position on the four cited violations and committed to provide NRC's evaluation at a future date.

On March 22, 2016, the NRC issued a letter (ML16082A107) responding to the licensee's letter dated December 23, 2015, documenting its position regarding violations 07000036/2015003-001, 07000036/2015003-002, 07000036/2015003-003 and 07000036/2015003-004. In summary, the NRC found that the licensee's corrective action response to violations 07000036/2015003-001, 07000036/2015003-002 and 07000036/2015003-003 was inadequate and required additional information and documented corrective actions to address the cited violations. The NRC acknowledged that corrective actions concerning violation 07000036/2015003-004 appeared adequate and may be reviewed during a future inspection.

On April 20, 2016, the licensee sent a letter (ML16111B114) responding to NRC's letter dated March 22, 2016. At the time of the exit meeting for this inspection, the NRC has not responded to the licensee whether the corrective actions documented in the licensee's April 20, 2016 letter were adequate. The corrective actions regarding these three violations will addressed in future correspondence.

In the NRC letter dated November 27, 2015, the NRC documented that it was concerned with seven instances where isolation controls had been discussed in the inspection report as an issue that needed addressing or a violation of NRC requirements, which included VIO 07000036/2015002-002. Therefore, the NRC had requested that licensee provide the results of an extent of condition review relating to any and all potential or actual isolation control breaches, which would include storm water control, in any areas where Final Status Surveys had been performed and radioactive material could have been impacted and the licensee's response to each event, including an evaluation of any and all radiological conditions.

The licensee responded to NRC's request in a letter dated December 23, 2015. In the letter, the licensee stated that "Westinghouse considers the request as written to be disproportionate to the information necessary to ensure that radioactive material from an area in which Final Status Survey was not completed was not transferred into a survey unit by storm water or other natural phenomena and the survey unit thereafter would be released for unrestricted use."

The NRC is continuing to review the licensee's response to the previously identified violations and to the request for the results of an extent-of-condition evaluation discussed in IR 07000036/2015003(DNMS). The inspectors are reviewing this matter, in conjunction with other NRC findings during confirmatory surveys and a violation of NRC requirements documented in this report to determine the adequacy of the response and whether the information is sufficient to ensure compliance with the ALARA required, in part, within 10 CFR 20.1402.

No findings of significance were identified.

c. Conclusions

The NRC is continuing to review the licensee's corrective actions associated with violations 07000036/2015003-001, 07000036/2015003-002 and 07000036/2015003-003. The NRC is also continuing to review the licensee's response to the NRC's request for the results of an extent-of-condition evaluation. The NRC considers violation 07000036/2015003-004 closed.

2.4 Confirmatory Surveys

a. Inspection Scope

During this inspection period, the inspectors and Oak Ridge Associated Universities personnel (ORAU) performed confirmatory surveys on December 15 through 18, 2015 of LSAs 08-06, 08-11, and 08-17; and on January 12 through 14, 2016 of LSAs 01-01, 01-02, and 01-03 (i.e., Joachim Creek). In addition, the inspectors performed independent walk-over surveys of the adjacent low laying areas northwest of Joachim Creek, between the railroad tracks and creek.

The inspectors reviewed final reports of ORAU's independent confirmatory survey summary and results for: (1) LSAs 10-03 and 10-04, and scan survey results for LSAs 10-01 and 10-02 (ML16111B050); (2) LSAs 02-01, 02-02, and 02-03 (ML16082A071); and (3) LSAs 08-06, 08-11, and 08-17 (ML16144A018).

The inspectors also reviewed the ORAU laboratory analytical report (ML16034A089) regarding 36 soil samples collected from LSA 03-01 and re-use soil pile 03-01, and LSAs 04-02, 04-03, 05-01, 05-02, 05-03, 05-04, 06-02, 11-01, 11-03, 11-04, and 11-05, collected during the onsite inspection on September 28 through October 1, 2015.

As part of this inspection, the inspectors interviewed contractor/licensee technical and management staff.

b. Observations and Findings

During the December 2015 onsite inspection, the inspectors, using calibrated Ludlum Model 2241-3s with Ludlum Model 44-10 detectors, and ORAU, with their own independent calibrated instrumentation, identified a discrete sample in LSA 08-11 and several elevated areas in LSA 08-17 with activities greater than the approved Derived Concentration Guideline Level ($DCGL_w$) and Sum-of-Fractions (SOFs) greater than unity. The licensee had since completed further remediation of the affected areas and adequately demonstrated the survey units' final status to meet the release criteria for free release.

During the January 2016 onsite inspection, ORAU initiated confirmatory surveys of LSAs 01-01, 01-02, and 01-03 (i.e., Joachim Creek) and will continue into the next inspection period, weather permitting. ORAU collected a total of 19 sediment samples (LSA 01-01 = 6 samples; LSA 01-02 = 6 samples; and LSA 01-03 = 7 samples) from the creek for analysis and the results are pending final ORAU confirmatory survey report for NRC's review and approval during the next inspection period. Preliminary laboratory analytical results indicated SOFs of less than unity for each of the samples. NRC inspectors' independent walk-over surveys of the adjacent low laying areas northwest of Joachim Creek, between the railroad tracks and creek resulted in instrument readings within the background variability levels of 4000 to 10,000 counts per minute (CPM).

The NRC inspectors determined that ORAU adequately documented their survey activities of independent confirmatory survey summary and results, and agree with their conclusions for the following reports:

1) ORAU Report 5184-SR-05-0, dated April 16, 2016 (ML16111B050), documented confirmatory survey activities for LSAs 10-03 and 10-04, and scan survey results for LSAs 10-01 and 10-02.

   Report Conclusion:

   At NRC's request, ORAU completed confirmatory surveys of two FSS survey units and performed gamma scans of two additional units at Hematite from May 4–7, 2015. The survey activities included document reviews, gamma walkover surveys, soil sampling activities, and laboratory analysis of confirmatory soil samples. All final confirmatory survey Radioisotope-of-Concern (ROC) concentrations from the LSA 10-03 and LSA 10-04 soil samples were below the individual Uniform Stratum $DCGL_W$ limits and also satisfied the SOF $DCGL_W$ criteria. The average SOF concentrations between the ORAU and Westinghouse Electric Company (WEC) sample populations for both SUs were in statistical agreement. Based on the findings of the confirmatory survey, ORAU is of the opinion that the licensee has adequately demonstrated that survey units LSA 10-03 and 10-04 meet the release criteria. Though ORAU was unable to fully assess the residual radiological status of LSAs 10-01 and 10-02, the walk-over survey data showed that gamma surface activity levels were within the background variance for the site.

2) ORAU Report 5184-SR-06-0, dated March 15, 2016 (ML16082A071), documented confirmatory survey activities for LSAs 02-01, 02-02, and 02-03.

   Report Conclusion:

   At NRC's request, ORAU completed confirmatory surveys of three FSS survey units from September 1–3, 2015. The survey activities included document reviews, beta scans, gamma walkover surveys, soil sampling, and laboratory analysis of confirmatory soil samples. All confirmatory survey ROC concentrations from the LSA 02-01, LSA 02-02 and LSA 02-03 soil samples, except sample 5184S0122 which was remediated through sampling, were below the individual uniform stratum $DCGL_W$ limits and also satisfied the SOF $DCGL_W$ criteria. The average SOF concentrations between the ORAU and WEC sample populations for all three LSAs were in statistical agreement with the exception of one confirmatory sample in LSA 02-01 with an elevated concentration of Tc-99 that skewed the SOF data presented in Table 4.2 of the report. In addition, ORAU reviewed the licensee's inter-office memorandum for the *Discreet Contaminated Items Identified in Site Pond LSA 02-01 by ORAU* (WEC 2015h). The licensee provided extensive detail about site remediation activities and weather events that led them to conclude the 15 discreet particles identified in LSA 02-01 were from roofing material deemed as low-level waste (LLW) that had been staged for offsite disposal in the SU adjacent to LSA 02-01. Based on the information provided by the licensee and the material identification report from SwRI (i.e., SwRI 2015 Analytical Report: Unknown Identification. Southwest Research Institute. San Antonio, Texas. October 20, 2015) (ML16165A229), ORAU is of the opinion that the licensee's conclusion is plausible and the discreet LLW items were most likely remnants from the staging area in LSA 05-04 that washed into the SU following FSS activities as opposed to material that was not identified during FSS activities. Based on the findings of the confirmatory survey, and provided the NRC's follow-up walkover survey concluded that the licensee had remediated all contaminated roofing material from LSA 02-01, ORAU is

of the opinion that the licensee has adequately demonstrated that survey units LSA 02-01, 02-02 and 02-03 meet the site-approved release criteria.

3) ORAU Report 5184-SR-07-0, dated May 20, 2016 (ML16144A018), documented confirmatory survey activities for LSAs 08-06, 08-11, and 08-17.

Report Conclusion:

At NRC's request, ORAU completed confirmatory surveys of three FSS survey units at the Hematite Decommissioning Project during the period of December 15–18, 2015. The survey activities included document reviews, gamma walkover surveys, sampling activities, and laboratory analysis of confirmatory samples. All confirmatory survey ROC concentrations from the LSA 08-06, LSA 08-11 and LSA 08-17 soil samples, except samples 5184M0002, 5184S0132, 5184S0133, and 5184S0152, were below their respective $DCGL_W$ limits and also satisfied the SOF $DCGL_W$ criteria. The average SOF concentrations between the ORAU and WEC sample populations for all three SUs were in statistical agreement with the exception of one confirmatory sample in LSA 08-11 with an elevated concentration of Tc-99 that skewed the SOF data presented in Table 4.2. Based on the findings of the confirmatory survey and proper disposal of sample 5184M0002, ORAU is of the opinion that the licensee has adequately demonstrated that survey units LSA 08-06 and 08-11 meet the site-approved release criteria. However, the results of three judgmental samples collected in LSA 08-17 suggested that the survey unit did not satisfy the uniform $DCGL_W$ criteria applied to the unit. The licensee provided an explanatory document and a MARSSIM-based elevated measurement comparison DCGL ($DCGL_{EMC}$) calculation for biased sample 3430-SS-151215-09-01, a split of confirmatory sample 5184S0132, which represented the licensee's highest sum-of-fraction value in excess of unity (WEC 2016d and 2016e). Although ORAU's SOF value for this sample location was higher than the licensee's (1.42 vs 1.16), this is an understandable variation based upon the homogeneity of ROC particulates within the sample matrix. Overall, ORAU did not find any issues in the methodology used for the calculation to dispute the licensee's determination. This conclusion along with the consideration that confirmatory scans only identified six discreet locations above the gamma investigation level within the survey unit, leads ORAU to the opinion that the licensee has adequately demonstrated that LSA 08-17 also satisfies the NRC-approved soil and surface activity DCGLs.

Based on the ORAU laboratory analytical report regarding 36 soil samples from LSA 03-01 and re-use soil pile 03-01, and LSAs 04-02, 04-03, 05-01, 05-02, 05-03, 05-04, 06-02, 11-01, 11-03, 11-04, and 11-05; collected during the onsite inspection on September 28, through October 1, 2015; there were no samples with a SOF greater than unity.

c. Conclusions

The inspectors concluded that decommissioning activities continued to be conducted in accordance with the NRC license, approved DP, work plans, procedures, and NRC regulations. However, the NRC noted a number of examples during confirmatory surveys of the licensee not identifying detectable quantities of radiological contamination.

2.5 Contaminated Soil Under Natural Gas Pipeline

a. Inspection Scope

The inspectors reviewed the issue concerning radiologically contaminated soil under the natural gas pipeline. This issue had been identified as an inspection follow-up item (IFI 07000036/2015001) in Inspection Report 07000036/2015001, dated April 28, 2015 (ML15118A946).

b. Observations and Findings

During the inspection, the inspectors noted that the licensee had discussions with the owner of the natural gas pipeline regarding the radiological contamination left under the pipeline itself. It is NRC's understanding that within those discussions, the owner of the natural gas agreed that the licensee's plan to remediate and, in some cases, keep residual contamination in place under the pipeline was satisfactory.

It is also NRC's understanding that the residual radiological contamination that will remain under the natural gas pipeline will meet the release limits as required by 10 CFR 20.1402 and the licensee's DP. The NRC will review the licensee's FSS for this area at a future date.

No findings of significance were identified.

c. Conclusions

The NRC considers IFI 07000036/2015001 closed.

3.0 Environmental Protection (88045)

3.1 Groundwater Sampling and Well Installation Program

a. Inspection Scope

The inspectors observed workers collecting groundwater samples to ensure sampling techniques were in accordance with applicable procedures and a well installation at the backfilled former burial pit area. The inspectors reviewed the following procedures prior to the sampling and monitoring well installation activities, HDP-PR-EM-011, "Low Flow Well Sampling," HDP-PR-EM-012, "Water Quality Field Measurements," and HDP-WP-ENG-810, "Post Remediation Monitoring Well Installation."

b. Observations and Findings

A total of five wells (GW-X, NB-64, NB-82, BR-12-JC, BR-12-RB) were sampled during the inspection by licensee personnel. The licensee personnel were observed to be competent and proficient in the collection of water samples in accordance with applicable procedures.

On April 26, 2016, the inspectors observed one of the bedrock well installations (BR-18-JC) at a backfilled former burial pit. The well is being installed to support the licensee's groundwater monitoring program. The inspectors observed that while cutting into the bedrock, the drill cutting and groundwater were discharged to the ground. The

inspectors notified licensee personnel and the onsite representative of Missouri Department of Natural Resources (MDNR) that due to the potential of Tc-99 and volatile organic compound (VOC) contamination in groundwater, discharge directly to the ground could re-contaminate formerly remediated areas. The licensee procedures did not specifically address the collection of water discharge.

The licensee informed the inspectors that the procedures would be modified to address water discharge from the well installation program.

On April 28, the licensee revised the work package to include collection and transfer of discharge to the water treatment system. Water samples of the discharge collected by MDNR on April 26, 2016, indicated certain VOC's exceeding MCL based on GEL Lab report dated May 03, 2016.

The licensee and MDNR collected soil samples at the locations of water discharge at BR-15-JC and BR-18-JC, to verify that no chemical impacts to the backfill soil occurred. Results are pending.

No findings of significance were identified.

c. Conclusions

The inspectors concluded that the licensee conducted the quarterly groundwater sampling and well monitoring installation in accordance with its procedures.

3.2 Effluent Monitoring Report

a. Inspection Scope

The inspectors reviewed the licensee reporting requirements as required by 10 CFR 70.59.

b. Observations and Findings

On March 9, 2016, the licensee submitted an Effluent Monitoring Report for the calendar period of July 1, 2015 through December 31, 2015.

10 CFR 70.59 states, in part, that each licensee authorized to possess and use special nuclear material within 60 days after January 1 and July 1 of each year shall submit a liquid and gaseous Effluent Monitoring Report.

On March 9, 2016, the licensee submitted a liquid and gaseous Effluent Monitoring Report which exceeded 60 days after January 1, 2016.

The licensee committed to reprioritize documentation of future reports and submit them in a timely manner.

This failure constitutes a violation of minor significance and is not subject to formal enforcement action.

c. Conclusions

One violation of minor significance was identified which is not subject to formal enforcement action.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORAMTION

PARTIAL LIST OF PERSONS CONTACTED

Westinghouse Electric Company

J. Smetanka, Managing Director, Hematite Decommissioning Project
G. Fussell, Deputy Director, Hematite Decommissioning Project
K. Pallagi, Licensing Manager/Security Manager
W. Clark, Radiation Safety Officer

INSPECTION PROCEDURES

IP 83822 Radiation Protection
IP 83890 Closeout Inspection and Survey
IP 88045 Environmental Protection

ITEMS OPENED, CLOSED AND DISCUSSED

Opened	Type	Summary
VIO 07000036/2015004-001	VIO	GWS 3-Inch Distance
URI 07000036/2015004-001	URI	ALARA 10 CFR 20.1402
URI 07000036/2015004-002	URI	Survey Unit Reclassification
Closed	**Type**	**Summary**
VIO 07000036/2015003-004	VIO	GWS 3-Inch Distance
VIO 07000036/2015004-001	VIO	GWS 3-Inch Distance
IFI 07000036/2015001-001	IFI	Contaminated Soil Under Natural Gas Pipeline
Discussed	**Type**	**Summary**
VIO 07000036/2015003-001	VIO	Storm Water in LSA 02-01
VIO 07000036/2015003-002	VIO	Inadequate Survey Procedures
VIO 07000036/2015003-003	VIO	100 Percent of GWS
VIO 07000036/2015002-002	VIO	Survey Unit Isolation Control

DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the report.

HEM-12-73, "*Request for Approval of the Hematite Final Status Survey Plan for Piping Remaining After Decommissioning",* dated July 3, 2012 (ML12187A121)

NRC letter dated April 5, 2013, "*U.S. Nuclear Regulatory Commission Review of Westinghouse Hematite's Final Status Survey Plan for Piping,"* HDP-PO-FSS-800 (ML13031A452)

HDP-PR-EM-012, "Water Quality Field Measurements"

HDP-PR-EM-011, "Low Flow Well Sampling"

FINAL REPORT-INDEPENDENT CONFIRMATORY SURVEY SUMMARY AND RESULTS FOR SURVEY UNITS LSA 10-03 AND LSA 10-04 AND SCAN SURVEY RESULTS FOR LSA 10-01 AND LSA 10-02 FOR THE HEMATITE DECOMMISSIONING PROJECT, FESTUS, MISSOURI (RFTA NO. 14-003); DCN 5184-SR-05-0 (ML16111B050)

FINAL INTERIM REPORT-INDEPENDENT CONFIRMATORY SURVEY SUMMARY AND RESULTS FOR SURVEY UNITS LSAs 02-01, 02-02, AND 02-03 FOR THE HEMATITE DECOMMISSIONING PROJECT, FESTUS, MISSOURI (RFTA NO. 14-003); DCN 5184-SR-06-0 (ML16082A071)

FINAL REPORT-INDEPENDENT CONFIRMATORY SURVEY SUMMARY AND RESULTS FOR SURVEY UNITS LSAs 08-06, 08-11, AND 08-17 FOR THE HEMATITE DECOMMISSIONING PROJECT, FESTUS, MISSOURI (RFTA NO. 14-003); DCN 5184-SR-07-0 (ML16144A018)

ORISE CONTRACT NO. DE-AC05-060R23100 SUBJECT: LETTER REPORT FOR ANALYTICAL RESULTS FOR THIRTY SIX SOIL SAMPLES ASSOCIATED WITH THE WESTINGHOUSE HEMATITE DECOMMISSIONING PROJECT IN FESTUS, MISSOURI [TAC NO. 07000036/2015003] [DOCKET NO. 070-00036] (RFTA NO. 16-001) DCN: 5279-LR-OI-O (ML16034A089)

SwRI (i.e., SwRI 2015 Analytical Report: Unknown Identification, Southwest Research Institute, San Antonio, Texas, October 20, 2015) (ML16165A229)

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As is Reasonably Achievable
CFR	Code of Federal Regulations
CHP	Certified Health Physicist
CPM	Counts per Minute
DCGL	Derived Concentration Guideline Level
DNMS	Division of Nuclear Materials Safety
DP	Decommissioning Plan
FSS	Final Status Survey
GWS	Gamma Walkover Survey
IFI	Inspection Followup Item
IP	Inspection Procedure
IR	Inspection Report
ISFSI	Independent Spent Fuel Storage Installation
LLW	Low-Level Waste
LSA	Land Survey Area
ML	ADAMS Accession Number (Main Library)
MDNR	Missouri Department of Natural Resources
NRC	U.S. Nuclear Regulatory Commission
ORAU	Oak Ridge Associated Universities
PQP	Project Quality Plan
ROC	Radioisotope-of-Concern
SNM	Special Nuclear Material
SOF	Sum-of-Fraction
SU	Survey Unit
URI	Unresolved Item
VIO	Violation
VOC	Volatile Organic Compound
WEC	Westinghouse Electric Company