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Phase II Final Status Survey Report Mallinckrodt Columbium-Tantalum Plant

St. Louis, Missouri

Chapter 5

Project No. 137131 **Revision 0**

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ABBREVIATIONS AND ACRONYMS

%	percent
σ	sigma; standard deviation
AECOM	AECOM Technical Services
C-T	Columbium-Tantalum
cm	centimeters
$DCGL_W$	derived concentration guideline level
DP	Decommissioning Plan
dpm/100 cm^2	disintegrations per minute per 100 square centimeters
DQI	data quality indicator
DQO	data quality objectives
Energy*Solutions*	Energy*Solutions*, LLC
FSS	final status survey
FSSR	Final Status Survey Report
FWHM	full-width half maximum
GPS	global position system
GWS	gamma-walkover survey
keV	kilo-electron volt
L	liter
m	meter
MDC	minimum detectable concentration
N/A	not applicable
NAD	North American Datum
NaI	sodium iodide
NRC	U.S. Nuclear Regulatory Commission
NIST	National Institute of Standards and Technology
pCi/g	picoCuries per gram
PHP	Project Health Physicist
QC	quality control
Ra	radium
SOF	sum of fractions
Th	thorium
U	uranium
USGS	United States Geological Survey

5.0 DATA QUALITY ASSESSMENT

Data quality assessment was performed in accordance with the Columbium-Tantalum (C-T) Phase II Decommissioning Plan (DP), Section 14.4.4. Data collection activities were performed in a controlled, deliberate manner by trained individuals with calibrated instruments following established protocols. Data were recorded and reviewed, and documentation is auditable upon request. Instrumentation capable of detecting the radiation types and energies of interest were selected, calibrated, and maintained for survey data collection.

Chapter 2 of this Final Status Survey Report (FSSR) discussed that two decommissioning contractors performed the remediation and final status surveys for Phase II of the C-T Plant decommissioning. The first decommissioning contractor was AECOM Technical Services (AECOM). The second decommissioning contractor was Energy*Solutions*, LLC (Energy*Solutions*). In general, the methodologies and performance criteria were consistent between the decommissioning contractors. When no distinction is made within this chapter of the FSSR, the discussion applies to both decommissioning contractors. When methodologies or performance criteria were different, they are described separately for each decommissioning contractor.

5.1 DATA QUALITY INDICATORS

Quality control (QC) measures were implemented to ensure data met known and suitable data quality criteria, i.e., data quality indicators (DQIs) including precision, accuracy, representativeness, comparability, and completeness. Variables related to data precision and accuracy were monitored by instrument response checks designed to track the performance of the instrumentation used to collect the data. Duplicate analyses were performed by the off-site laboratory and the results compared to on-site results. The representativeness of the data was ensured through the use of standardized data collection methods and techniques following industry standard protocols and guidance. The type and quantity of collected data were reviewed against project Data Quality Objectives (DQOs) to ensure data completeness.

5.2 PERSONNEL SELECTION AND TRAINING

The selection of project staff was based upon their experience on similar projects and their familiarity with the types of equipment being utilized, soil remediation logistics and survey protocols. All project staff received site specific training to the plans and procedures. Additional training was provided commensurate with the type of work each individual performed. This included general radiation worker training and training on personnel protective equipment, the final status survey (FSS) protocols, and sampling requirements.

5.3 FIELD SURVEY INSTRUMENTATION

Survey data were collected using commercially available instruments which were selected based on reliable operation, detection sensitivity, operating characteristics, and expected performance in the field. Field survey instrumentation calibration, set-up calculations, and daily response check data are available upon request. Table 5-1 lists the survey instrumentation for both decommissioning contractors.

Table 5-1 Survey Instrumentation

Instrument	Detector	Radiation Detected	Calibration	Use
AECOM				
Ludlum Model 2221	Model 44-20 gamma scintillator	gamma	^{137}Cs	Gamma scans
Trimble GPS	N/A [a]	N/A	N/A	Scan surveys
Ludlum Model 2360	Model 43-37 gas flow proportional	Alpha Beta	^{230}Th ^{99}Tc	Surface scans
Ludlum Model 2360	Model 43-93 gas flow proportional	Alpha Beta	^{230}Th ^{99}Tc	Surface scans and direct measurements
Ludlum Model 2360	Model 43-68 gas flow proportional	Alpha Beta	^{230}Th ^{99}Tc	Surface scans and direct measurements
Genie 2K Gamma Spec	HPGe	gamma	Mixed gamma	Isotopic Analysis
Protean	Shielded gas-flow proportional	Alpha Beat	^{230}Th ^{99}Tc	Smear Counting and Air Samples
Ludlum Model 2929	Model 43-10-1	Alpha Beta	^{230}Th ^{99}Tc	Smear Counting
Ludlum Model 12	GM pancake	Beta	^{99}Tc	Personnel Frisking and Direct Surveys
Energy*Solutions*				
Ludlum Model 2350-1	Model 44-10 gamma scintillator	gamma	^{137}Cs	Gamma scans
Trimble GPS	N/A	N/A	N/A	Scan surveys
Eberline Model E-520	HP-270 GM probe	gamma	^{137}Cs	Waste and shipment surveys
Genie 2K Gamma Spec	HPGe	gamma	Mixed gamma	Isotopic Analysis
Ludlum Model 2929	Model 43-10-1	Alpha Beta	^{230}Th ^{99}Tc	Smear Counting
Protean	Shielded gas-flow proportional	Alpha Beat	^{230}Th ^{99}Tc	Smear Counting and Air Samples
Ludlum Model 3 and 12	GM pancake	Beta	^{99}Tc	Personnel Frisking and Direct Surveys
Ludlum Model 2350-1	Model 43-68 gas flow proportional	Alpha Beta	^{230}Th ^{99}Tc	Surface scans and direct measurements
Ludlum Model 2350-1	Model 43-37 gas flow proportional	Alpha Beta	^{230}Th ^{99}Tc	Surface scans

[a] Not applicable

5.4 CALIBRATION

Survey instruments were calibrated prior to use. Radiation detection instruments were calibrated for the radiation types and energies of interest. Radioactive sources used for calibration purposes were traceable to the National Institute of Standards and Technology (NIST). Instrumentation was inspected prior to use to ensure its proper working condition, and properly protected against inclement weather conditions during operation.

5.4.1 Instrument Response

Instrument response was checked before instrument use each day, at a minimum. A check source was used that emits the same type of radiation (e.g., gamma) as the radiation being measured and that gives a similar instrument response, as applicable. The source check was performed using a specified source-detector geometry that could be easily repeated. The specific instrument response procedures are summarized below for each decommissioning contractor.

5.4.1.1 AECOM

Radiological Instruments

Prior to initial instrument use, instrument baselines were established by collecting 20 one-minute measurements using a source representative of the radiation type (i.e., gamma). Twenty one-minute measurements were also made to determine the instrument's expected response to ambient background. The mean of the observed count rates were calculated from the initial source and background measurements. The daily acceptance criterion was set at two standard deviations (±2σ) from the mean for both the source and background counts.

GPS Unit

By design, the global position system (GPS) unit is self-checking, using data received from the satellite constellation to determine the precision and accuracy of its readings. Positional accuracy based on United States Geological Survey (USGS) maps was confirmed relative to known positions of site features.

5.4.1.2 Energy*Solutions*

Ratemeters

Instruments used to measure gross radiation levels such as friskers and dose rate meters received an initial instrument baseline and were source checked daily with an acceptance criterion of ±20% of the initial baseline measurement. For daily response checks that were not within the acceptance criteria, personnel rechecked the source geometry, source type, location of potential extraneous radiation sources, and re-performed a source response check. If the recount was within acceptance criteria, then the instrument was used. If the recount remained outside the acceptance criteria, then the Energy*Solutions* Project Health Physicist (PHP) was notified and the instrument removed from service. Results of daily checks were plotted on individual control charts, which were reviewed by the Energy*Solutions* PHP.

Scalar Counters

Field instruments and sample counters used in a scalar mode (i.e., integrated counts per unit time) received an initial instrument baseline of 10 to 20 individual background and source counts. The background counts were used to calculate the minimum detectable concentration (MDC) for the instrument at various count times while the initial source checks were used to calculate acceptance criteria for subsequent daily source checks based upon the mean and standard deviation of the data set. The daily acceptance criteria were then set at ±2σ or 3σ from the mean, as described below.

If a daily response checks fell outside 2σ of the mean but was within 3σ the instrument was used and the Energy*Solutions* PHP was notified and the instrument monitored. If a daily response check fell outside 3σ, the instrument was source checked two more times. If one of the two additional measurements fell outside 3σ, the instrument was removed from service. If they both fell within 3σ, the instrument was used and the PHP was notified and the instrument monitored. Results were plotted on individual instrument control charts, which were reviewed by the Energy*Solutions* PHP.

GPS Unit

By design, the GPS unit does not require calibration, using data received from the satellite constellation to determine the precision and accuracy of its readings. To provide additional QC for this system, the GPS system was checked daily against a designated landmark or reference point. The reference point selected upon commencement of fieldwork was a fire hydrant adjacent to Building 121.

Prior to initial GPS use, ten static positional readings were obtained at the reference point. From these positional readings, a mean horizontal position was determined. This position was expressed in units of northing/easting using the North American Datum (NAD 83). Thereafter, the GPS unit was checked against the reference location, at least daily when used. The acceptance criterion for GPS daily checks was within one meter of the reference point. Results of the daily checks were recorded and posted to a GPS control chart, which was reviewed by a qualified engineer.

5.4.2 Minimum Detectable Concentration

Minimum detectable concentrations (MDCs) were calculated for both scanning and stationary measurements. The MDCs for alpha, beta, and gamma scanning and alpha and beta stationary measurements are discussed for each decommissioning contractor below, as applicable.

5.4.2.1 AECOM

Alpha Scanning

Based on the type of instrumentation used by AECOM in Table 5-1 and similar survey techniques as implemented by Energy*Solutions*, the alpha scanning sensitivity was considered to be consistent with Energy*Solutions*' alpha scanning sensitivity as presented in Section 5.4.2.2.

Beta Scanning

Based on the type of instrumentation used by AECOM in Table 5-1 and similar survey techniques as implemented by Energy*Solutions*, the beta scanning sensitivity was considered to be consistent with Energy*Solutions*' beta scanning sensitivity as presented in Section 5.4.2.2.

Gamma Scanning

The scan speed, distance above ground surface, radionuclides of concern, and detector characteristics were considered in the calculation. The scan MDC for the gamma-walkover survey (GWS), based on radium-226 (^{226}Ra), was estimated to be 1.9 picoCuries per gram (pCi/g).[1]

Alpha Stationary Measurements

Based on a review of AECOM surveys the typical MDC for their fixed point alpha measurements was approximately 40-50 dpm/100 cm^2.

Beta Stationary Measurements

Based on a review of AECOM surveys the typical MDC for their fixed point beta measurements was approximately 400-500 dpm/100 cm^2.

5.4.2.2 Energy*Solutions*

Alpha Scanning

Alpha scans were performed on asphalt released for recycling as well as structural concrete prior to use as backfill. Scan speeds did not exceed one detector width per second while maintaining the detector as close to the surface as possible while scanning. Scan sensitivities were calculated following the guidance provided in NUREG-1507, *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*. The scan MDC for the Ludlum model 43-37 and 43-68 gas flow proportional detectors is approximately 600 disintegrations per minute per 100 square centimeters (dpm/100 cm^2) for typical background.

Beta Scanning

Beta scans were performed on asphalt released for recycling as well as structural concrete prior to use as backfill. Scan speeds did not exceed one detector width per second while maintaining the detector as close to the surface as possible while scanning. Scan sensitivities were calculated following the guidance provided in NUREG-1507, *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*. The scan MDCs for the Ludlum model 43-37 and 43-68 gas flow proportional detectors were approximately 5,200 and 2,600 dpm/100 cm^2 respectively for typical background.

Gamma Scanning

The scan speed, distance above ground surface, radionuclides of concern, and detector characteristics were considered in the calculation. Scan sensitivities were calculated following the guidance provided in NUREG-1507, *Minimum Detectable Concentrations with Typical*

[1] Appendix E of the AECOM Preliminary FSSR (AECOM 2012) for Plant 5 subsurface survey units SU01, SU02, and SU03 presents the MDC for the GWS.

Radiation Survey Instruments for Various Contaminants and Field Conditions. The scan MDCs for a 2-inch by 2-inch sodium iodide (NaI) detector were (Energy*Solutions* 2012): 1.6 pCi/g for thorium-232 (^{232}Th, in equilibrium with progeny), 2.2 pCi/g for ^{226}Ra (in equilibrium with progeny), and 53.1 pCi/g for uranium-238 (^{238}U).

<u>Alpha Stationary Measurements</u>

Direct alpha measurements were performed on asphalt released for recycling as well as structural concrete prior to use as backfill. Detection sensitivities were calculated following the guidance provided in NUREG-1507, *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*. The typical MDC for the Ludlum model 43-68 gas flow proportional detector was approximately 60 dpm/100 cm^2 for typical background.

<u>Beta Stationary Measurements</u>

Direct beta measurements were performed on asphalt released for recycling as well as structural concrete prior to use as backfill. Detection sensitivities were calculated following the guidance provided in NUREG-1507, *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*. The typical MDC for the Ludlum model 43-68 gas flow proportional detector was approximately 650 dpm/100 cm^2 for typical background.

5.5 SAMPLE ANALYSIS

One of the most important aspects of data quality assessment was to ensure the validity and reliability of the sample analyses. The following sections discuss the key elements for sample analysis.

5.5.1 Collection

5.5.1.1 AECOM

Samples approximately 1 liter (L) in volume were collected to a depth of 30 centimeters (cm). Samples that could not be collected to the full 30 cm depth due to subsurface obstructions were collected over a wider and shallower area. Visually identifiable non-soil components such as stones, twigs, and foreign objects were manually separated in the field; however, no screening or sifting of sample material was performed in the field. Sampling equipment (e.g., hand and power tools, mixing utensils, and homogenizing bowls) was decontaminated between samples to prevent cross contamination of sample media.

5.5.1.2 Energy*Solutions*

Volumetric samples were collected that are representative of the sampled media and of sufficient size, to allow the on-site and off-site laboratories to achieve the desired detection level. As a general rule, approximately 1,000 grams of material was collected per sample. Surface soil samples were collected to a depth of approximately 30 cm. Where sample depth could not be reached, samples were collected over a wider, shallower area. In the event groundwater prevented direct access to sample the bottom of an excavation, an alternative was to backfill as much as 1 meter (m) and perform core sampling through the backfill into the unexcavated bottom. Visually identifiable non-soil components such as stones, twigs, and foreign objects were manually separated in the field; however, no screening or sifting of sample material was performed in the field. Sampling equipment (e.g., hand and power tools, mixing utensils, and homogenizing bowls) was decontaminated between samples to prevent cross contamination of sample media.

5.5.2 Chain-of-Custody

5.5.2.1 AECOM

Samples were bagged in one-gallon ZipLock® bags, numbered, logged, and transferred to the on-site laboratory for analysis. Following collection, samples remained under control of the person collecting the sample until custody of the samples was transferred to the on-site laboratory. When sample custody was transferred (e.g., when samples are sent for laboratory analysis), a sample chain of custody record accompanied the samples for tracking purposes. The chain of custody record documents the custody of the sample from the point of measurement or collection until final results are obtained.

5.5.2.2 Energy*Solutions*

Samples were bagged, numbered and transferred to the on-site laboratory for analysis under a field data sheet and the samples logged into the laboratories sample log book. Following collection, sample collection was documented on the field data sheet and remained under control until they were logged into the on-site laboratory and stored in a secure facility. When sample custody was transferred (e.g., when samples are sent for off-site laboratory analysis), a chain of custody record accompanied the sample(s) for tracking purposes. The chain of custody record documented the custody of the sample from the Energy*Solutions*' on-site laboratory until final results were obtained.

5.5.3 Preparation

Samples were processed by drying and sifting through a No. 4 sieve to remove larger stones and debris. The samples were then packaged and sealed in sample containers for analysis in the same geometry as the system was calibrated. This was to ensure uniformity in the samples and to most closely match the system calibration. Additionally, sample spoils were monitored to ensure no activity was discarded.

5.6 Laboratory Analytical Performance

QC standards were included in routine on-site and off-site laboratory analyses to provide measures of accuracy, precision and comparability of the data generated. Specific QC measures for both laboratories as well as inter-laboratory comparisons are discussed below.

5.6.1 On-Site Laboratory QC

5.6.1.1 AECOM

Initial energy and efficiency calibrations of the on-site gamma spectroscopy system were performed using a mixed-gamma, NIST-traceable calibration standard that contains isolated singlet peaks over the entire energy range of interest. An initial background spectrum was accumulated, and a daily background count performed. The total activity of the calibration standard was used to check the energy and efficiency calibrations and the general operating parameters of the system on a daily basis. Where either the daily background or total activity counts fell outside a ±2σ control band, system performance was assessed and new energy and efficiency calibrations performed and a new background spectrum accumulated. On-site laboratory QC documentation is available upon request.[2]

5.6.1.2 Energy*Solutions*

Initial energy and efficiency calibrations of the on-site gamma spectroscopy system were performed using a mixed-gamma, NIST-traceable calibration standard that contains isolated singlet peaks over the entire energy range of interest. A series of initial baseline counts were collected for both background and the mixed gamma source and standard statistics determined including the mean and standard deviation for the peak activity and full-width half max for a low energy and high energy peak as well as the mean of the peak location. These statistical parameters were used to establish control charts and acceptance criteria for the daily system checks.

The system was checked daily, when in use, by measuring and tracking the peak energy, peak resolution, and net peak area for a high and low energy peak. Instrument control charts were generated and evaluated in accordance with the following acceptance criteria:

- peak energies must be within ±1 kilo-electron volt (keV) of the expected peak energy,
- the investigation limits for peak resolution (full-width half maximum [FWHM]) was ±2σ and the corresponding action limits were set at ±3σ.
- the investigation limits for photo peak count rates were ±2σ and the corresponding action limits were set at ±3σ.

If the QC parameters were within the investigation level, the system was ready for use. If any parameter fell outside the investigation level, but within the action level, the check was repeated once. If the second count was still outside the investigation level, or any count was outside the action level, the detector was taken out of service until the problem was resolved. After the problem was resolved, the system must have passed two consecutive checks prior to being placed back in operation or the system re-calibrated. The QC data and each spectral data report

[2] A limited set of on-site laboratory reports was provided in Appendix F of the AECOM Preliminary FSSR (AECOM 2012) for Plant 5 subsurface survey units SU01, SU02, and SU03.

were reviewed for trends and corrective actions taken in response to out of control conditions. On-site laboratory QC documentation is available upon request.

5.6.2 Off-Site Laboratory QC

Three types of QC samples were analyzed to evaluate off-site laboratory performance:

- Laboratory control samples to evaluate potential bias in the measurement results,
- Duplicate samples to evaluate precision and reproducibility, and
- Method blank samples to evaluate the potential for laboratory contamination.

The off-site laboratory reviewed the data for consistency and reasonableness and determined program requirements were satisfied. The QC sample results are found with the off-site laboratory analytical results, which can be provided upon request.[3]

5.6.3 On-Site vs. Off-Site Laboratory Comparison

A comparison of laboratory analytical performance was conducted to ensure on-site laboratory consistency with off-site laboratory results. A separate comparison was completed by each decommissioning contractor.

5.6.3.1 AECOM

A comparison of laboratory analytical performance (see Appendix G) was conducted to ensure onsite laboratory consistency with offsite laboratory results.[4] A total of 104 soil samples collected from Plant 5 subsurface survey units SU01 through SU06 were analyzed by gamma spectroscopy at the on-site laboratory. The soil samples were sent to the off-site laboratory where they were prepared and analyzed for ^{226}Ra by emanation (in-growth).

The comparison concluded that the on-site laboratory produced reliable results relative to the off-site laboratory. It found that, on the whole, the on-site laboratory reported slightly higher sum of fractions (SOF) results (by about 8%). Further evaluation on a radionuclide-specific basis revealed the on-site laboratory slightly, but consistently, over-reported the activity concentration of ^{226}Ra and consistently under-reported the activity concentration of ^{232}Th. The systematic addition of 0.051 to the ^{232}Th derived concentration guideline level ($DCGL_W$) fraction (i.e., ^{232}Th activity concentration divided by its $DCGL_W$) was recommended to ensure the on-site laboratory reporting for ^{232}Th remains representatively conservative. This recommendation was implemented with on-site analyses beginning on November 30, 2011. The comparison did not reveal a readily identifiable trend for ^{238}U.

[3] A limited set of off-site laboratory reports was provided in Appendices A, B, and C of the AECOM Preliminary FSSR (AECOM 2012) for Plant 5 subsurface survey units SU01, SU02, and SU03.

[4] Appendix G of the AECOM Preliminary FSSR (AECOM 2012) for Plant 5 subsurface survey units SU01, SU02, and SU03 contains the laboratory comparison.

5.6.3.2 Energy*Solutions*

A comparison of laboratory analytical performance was conducted to ensure on-site laboratory consistency with off-site laboratory results. All FSS surface samples for survey units SU10, SU11, SU12, SU13, and SU19 were sent for offsite analysis under chain of custody as well as the majority of borehole and bias samples with SOF exceeding 0.5. A total of 147 samples were sent to the off-site laboratory where they were prepared and analyzed for ^{226}Ra by emanation (in-growth) for verification.

The comparison concluded that the on-site laboratory produced reliable and conservative results relative to the off-site laboratory. It found that, on the whole, the on-site laboratory reported higher SOF results (by about 45%).

5.7 RECORDS MANAGEMENT

Copies of quality records were maintained on-site through the duration of the project. All quality records were peer reviewed, including the on-site and off-site analysis results. Specific records are available upon request.

5.8 NRC INSPECTIONS AND CONFIRMATORY SURVEYS

Summaries of the U.S. Nuclear Regulatory Commission (NRC) inspections performed over the course of the remediation project are provided in Table 5-2. Discussions of confirmatory surveys completed by the NRC's contractor are provided in subsequent chapters of this FSSR as they apply to each individual survey unit (i.e., SU01, SU02, and SU03).

Table 5-2 Summary of NRC Inspections

Inspection Report [a]	Dates of Inspection	Scope [b]	Conclusion
040-06563/2010-001 (ML110680213)	01/31/2011 and 02/23/2011	On-site inspection performed on January 31, 2011 including an in-office review on February 23, 2011. Reviewed the licensee's contractor mobilization and their preparation and start of work in Plant 5. Reviewed the contractor's on-site laboratory, radiological survey instrumentation program, and project plans. Interviewed select contractor and licensee management.	No violations were identified. No findings of significance were identified.
04006563/2011001 (ML111430673)	4/28/2011	Evaluated the on-site laboratory, which was used to guide excavation. Observed licensee's contractor conducting final status surveys, NRC's contractor ORISE conducting confirmatory surveys, and the licensee's contractor analyzing laboratory samples.	No violations were identified.
040-06563/2011-002 (ML111721708)	06/01/2011 and 06/02/2011	Observed NRC's contractor ORISE complete confirmatory surveys of SU01, SU02, and SU03. Observed licensee's contractor conducting final status surveys, excavation, and remediation. Reviewed the licensee's FSS sampling results for SU02 and verified material greater than ¼-inch included in sample analysis. Observed FSS sample collection from SU01 and SU03, sample processing for laboratory analyses, and excavation remediation activity guided by action levels based on gamma scans. Evaluated the licensee's contractor on-site including laboratory and radiological survey instrumentation quality assurance programs. Inspectors conducted independent confirmatory gamma scans of SU01, SU02, and SU03.	No violations were identified. No findings of significance were identified.
040-06563/11-003 (ML12181A332)	12/15/2011 through 05/31/2012	Examined decommissioning activities conducted under site-specific work plans and NRC-approved DP, including the review of decommissioning documents and representative records, observations of activities, and interviews with personnel. Reviewed FSS data packages for SU05, SU06, SU07, and SU20. Reviewed comparative analysis of on-site gamma spectroscopy with off-site confirmatory results, and did not identify any problems with the results. Reviewed sampling results of core boring from SU11, SU15, and SU21. Inspectors conducted independent radiological surveys of SU09 and SU17.	No violations were identified. The licensee conducted decommissioning activities in accordance with the NRC approved DP, work plans, procedures, and NRC regulations.

Table 5-2 Summary of NRC Inspections (continued)

Inspection Report [a]	Dates of Inspection	Scope [b]	Conclusion
040-06563/11-003 (ML12209A203)	N/A	Errata for document ML12181A332. No errata applicable to FSS.	N/A
04006563/12001 (ML13039A359)	6/1/2012 through 1/23/2013	Reviewed the change in the licensee's decommissioning contractor and the contractor's transition plan. Change-over from AECOM to Energy*Solutions* was completed on July 10, 2012. Performed confirmatory radiological surveys of SU11 and collected three samples for analysis by the NRC's contract laboratory. Reviewed FSS data packages for SU10, SU11, and SU19. Reviewed comparative analysis of on-site gamma spectroscopy with confirmatory sampling results.	No findings of significance were identified, including review of the licensee's change in decommissioning contractor.
04006563/13001 (ML13101A108)	3/15/2013	On-site inspection of completed decommissioning activities, including final status surveys. No remediation or final status surveys were being conducted at the time of the inspection. Performed confirmatory radiological surveys of the backfilled and affected areas within and around the Plant 5 area. Discussed status of non-C-T related radioactive contaminated material identified in the ground next to Building 240. This non-C-T material was not addressed or accounted for in the DP or license.	No findings of significance were identified. Based on the independent confirmatory surveys, the licensee conducted the decommissioning of Plant 5 in accordance with the DP and license requirements.

[a] Available from http://adams.nrc.gov/wba/ using the Accession Number provided in parenthesis.
[b] Only items from the inspection report applicable to the FSS are summarized.

5.9 REFERENCES

AECOM, *Phase II Decommissioning Mallinckrodt C-T Plant, St. Louis, Missouri, Preliminary Final Status Survey Report: Plant 5 Survey Units 01, 02, and 03*, March 2012.

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