DOCKET NO: A-98-49, II-A4-72

WASTE CHARACTERIZATION INSPECTION REPORT

EPA BASELINE INSPECTION NO. EPA-INL-CCP-RH-6.06-8 OF THE CENTRAL CHARACTERIZATION PROJECT REMOTE-HANDLED TRANSURANIC WASTE CHARACTERIZATION PROGRAM AT THE IDAHO NATIONAL LABORATORY

June 12–16, and August 9 and 29, 2006

U.S. Environmental Protection Agency
Office of Radiation and Indoor Air
Center of Federal Regulations
1200 Pennsylvania Avenue, NW
Washington, DC 20460

January 2007

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ATTACHMENTS

1.0 EXECUTIVE SUMMARY

In accordance with 40 CFR 194.8(b), the U.S. Environmental Protection Agency (EPA or the Agency) conducted Baseline Inspection No. EPA-INL-CCP-RH-6.06-8 of the Central Characterization Project's (CCP) waste characterization (WC) program for remote-handled (RH) transuranic (TRU) waste at the U.S. Department of Energy's (DOE) Idaho National Laboratory (INL) located outside of Idaho Falls, Idaho. EPA conducted a baseline inspection of the site's program to characterize RH TRU wastes proposed for disposal in the Waste Isolation Pilot Plant (WIPP). This inspection occurred in three segments:

- On-site inspection at INL on June 12–16, 2006
- Follow-up inspection on August 9, 2006, at DOE's Carlsbad Area Field Office (CBFO), for the purpose of assessing mass spectrometry data used to support one element of the INL RH WC program
- Follow-up inspection at CBFO on August 29, 2006, for the purpose of resolving open issues from the previous two inspections

Additionally, there were ongoing technical discussions during July and August 2006 between members of the EPA inspection team and CBFO technical contractors related to technical aspects of the INL-CCP RH WC program.

On November 2006, EPA issued a Federal Register (FR) notice (71 FR 65488, November 8, 2006) announcing the proposed approval of the RH waste characterization (WC) program implemented at INL by CCP. The FR notice opened a 45-day comment period to solicit public comment on the proposed approval of INL-CCP's RH WC program and the INL Baseline Inspection Report (EPA Air Docket A98-49, II-A4-69). The comment period ended December 26, 2006. EPA received one set of public comments. (See EPA Docket ID No. EPA-HQ-OAR-2006-0881). EPA evaluated and responded to the public comments (see Attachment C of this report), and made changes to the proposed approval decision, where appropriate. This report discusses EPA's approval of the RH waste characterization (WC) program implemented at INL by CCP.

EPA must verify compliance with 40 CFR 194.24 before waste may be disposed of at the WIPP, as specified in Condition 3 of the Agency's certification of the WIPP's compliance with disposal regulations for TRU radioactive waste (63 *Federal Register* (FR) 27354 and 27405, May 18, 1998). This was the first inspection of RH WC activities conducted by EPA at INL-CCP. EPA Baseline Inspection No. EPA-INL-CCP-RH-6.06-8 was performed in accordance with the provisions of 40 CFR 194.8(b), as issued in a July 16, 2004, FR notice (Vol. 69, No. 136, pp. 42571–42583). The purpose of the INL-CCP RH WC inspection was to evaluate the adequacy of the site's WC programs for one (1) RH debris waste stream to be disposed of at the WIPP. The activities examined during the inspection and approved for implementation included the following:

- Acceptable knowledge (AK) for RH retrievably-stored TRU debris waste (S5000).
- Radiological characterization as described in this report for RH retrievably-stored TRU debris waste (S5000).
- Visual examination (VE) of audio/video media for RH retrievably-stored TRU debris waste (S5000) containers.

EPA's inspection team determined that INL-CCP's RH WC program activities were technically adequate. EPA is approving the INL-CCP RH WC program in the configuration observed during the baseline and follow-up inspections, described in this report, and documented in detail in the checklists in Attachment A. The approval includes the following:

(1) The AK process for RH retrievably-stored TRU debris in one waste stream, designated by INL as INL Waste Stream No. ID-ANLE-S5000, Lots 1 through 20, which are defined by INL-CCP as a debris waste stream in CCP-AK-INL-500, Revision 3

(2) The radiological characterization process using dose-to-curie (DTC) and modeling-derived scaling factors for assigning radionuclide values to one RH waste stream for which the scaling factors are applicable, as described in CCP-AK-INL-501, Revision 1

(3) The VE of audio/video media process used for a total of nineteen (19) retrievably-stored RH debris waste drums included in three batch data reports (BDRs) – BDR Nos. RHINLVE60001, RHINLVE60002, and RHINLVE60003. (See Section 8.3 for further explanation.)

During the comment period for the proposed approval, INL-CCP provided EPA with additional information related to an improved VE technique as well as an additional VE BDR. (See EPA's response to Comments Nos. 8 and 12 in Attachment C of this report.) EPA has begun this evaluation and the results of the Tier 1 (T1) evaluation will be provided upon completion separately. If appropriate, EPA could expand its approval to the VE process evaluated as a T1 change.

EPA is not approving the WIPP Waste Information System (WWIS) for entry and tracking of the waste contents of RH debris wastes at this time. Although the WWIS is currently approved by EPA for tracking contact-handled (CH) waste, INL-CCP had not demonstrated its adequacy to enter and track RH waste contents during this baseline inspection. During the comment period for the proposed approval CBFO notified EPA that the WWIS was operational for RH wastes and was ready for EPA evaluation as a T1 change. EPA has begun this evaluation and the results of EPA's T1 evaluation will be provided upon completion separately.

EPA is also not approving real-time radiography (RTR) at this time. INL-CCP did not have an operational RTR unit in place at the time of the inspection. This final baseline inspection requires the use of RTR as a T1 change. Therefore, INL-CCP cannot ship RH waste to the WIPP using RTR as a WC technique until it is approved by EPA. EPA received a request for an evaluation and approval of a RTR process. Once the evaluation is complete, the results of the T1 evaluation will be provided separately.

Any changes to the WC activities from the date of the baseline inspection must be reported to and, if applicable, approved by EPA, according to Table 1. Please note that each T1 and Tier 2 (T2) change listed in Table 1 is followed by a reference to the report section where the technical basis for the T1 or T2 designation is presented.

In October 2006, EPA concurred with CBFO's request for allowing INL-CCP to submit T2 changes implemented at the EPA-approved TRU sites four times a year at the end of each fiscal quarter. (See EPA letter to CBFO dated October 26, 2006; EPA Air Docket No. A-98-49, II-A4-76). INL-CCP may submit all T2 changes discussed in this report on the same schedule.

Table 1. Tiering of RH TRU WC Processes Implemented by INL-CCP (Based on June 12–16 Baseline and August 9 & 29, 2006, Follow-Up Inspections)

RH WC Process Elements	INL-CCP RH WC Process - T1 Changes	INL-CCP RH WC Process - T2 Changes*
Acceptable Knowledge (AK)	Modification of the approved waste stream ID-ANLE-S5000 to include additional containers, i.e., K Cell or other debris wastes; AK (1) and AK (5) Any new waste streams not approved under this baseline; AK (1) and AK (7) Substantive modification(s)*** that have the potential to affect the characterization process: CCP-AK-INL-500, CCP-AK-INL-501, or CCP-AK-INL-502; AK (6) and AK (7) Load management for any RH waste stream; AK (16)	Notification to EPA when updates to CCP-INL-AK-500, CCP-INL-AK-501, and CCP-INL-AK-502 are approved by CBFO; AK (4) Notification to EPA when changes to AK documentation as a result of WCPIP revisions** have been made (e.g., CRR); AK (7) and AK (9) Notification to EPA when a Correlation or Surrogate Summary Form is completed for each of the RH containers in this waste stream identified as CH based upon measured dose rates that present NDA results for assayed containers; AK (10), AK (14) and RC (8.2.2) Notification to EPA once waste stream data package for debris waste stream, and any modifications to the WSPF including the CRR and AK Summary are completed; AK (14) Notification to EPA that the final DTC determination is complete for RH containers numbers 728 through 737, as identified in AK Reference P030; all other AK accuracy reports prepared annually at a minimum; AK (15)
Radiological Characterization, including Dose-to-Curie (DTC)	Application of new scaling factors for isotopic determination other than those documented in CCP-AK-INL-501; RC (8.2.2 and 8.2.3) Use of any alternate radiological characterization procedure other than DTC with established scaling factors as documented in CCP-TP-504 or substantive modification of the DTC procedure***; RC (8.2.2 and 8.2.3) Any new waste stream not approved under this baseline or addition of containers to Waste Stream ID-ANLE-S5000 that requires changing the established radionuclide scaling factors; RC (8.2.3)	Revisions of CCP-AK-INL-501or CCP-TP-504 that require CBFO approval; RC (8.2.2 and 8.2.3)
Visual Examination of audio/video media (VE)	Implementation of VE following this baseline approval; if INL-CCP decides to use VE in the future, EPA approval is necessary	None
Real-Time Radiography (RTR)	Any use of RTR requires EPA approval	None
WIPP Waste Information System (WWIS)	Any use of WWIS requires EPA approval prior to RH waste disposal	None

* Upon receiving EPA approval, INL-CCP will report all T2 changes to EPA every three months.

** Excluding changes that are editorial in nature or are required to address administrative concerns.

*** *Substantive modification* refers to a change with the potential to affect INL-CCP's RH WC process, e.g., the use of an inherently different type of measurement instrument or the use of the high-range probe as described in CCP-TP-504.

EPA will notify the public of the results of its evaluations of T1 and T2 changes established as part of today's approval through the EPA Web site and by sending e-mails to the WIPPNEWS list (see Section 2.0, below, for a brief discussion of tiering). All T1 changes must be submitted for approval before their implementation and will be evaluated by EPA. Upon approval, EPA will post the results of the evaluations through the EPA Web site and the WIPPNEWS list, as described above.

2.0 PURPOSE OF INSPECTIONS

On May 18, 1998, EPA certified that the WIPP will comply with the radioactive waste disposal regulations in 40 CFR Part 191. In this certification, EPA also included Condition 3, which states that "the Secretary shall not allow shipment of any waste from…any waste generator site other than LANL [Los Alamos National Laboratory] for disposal at the WIPP until the Agency has approved the processes for characterizing those waste streams for shipment using the process set forth in §194.8." The approval process described at 40 CFR 194.8 requires DOE to (1) provide EPA with information on AK[1] for waste streams proposed for disposal at the WIPP, and (2) implement a system of controls used to confirm that the total amount of each waste component that will be emplaced in the WIPP will not exceed limits identified in the WIPP Compliance Certification Application (CCA).

Under the changes to 40 CFR 194.8 promulgated in the July 16, 2004, FR notice, EPA must perform a baseline inspection of a TRU waste generator site's WC program. The purpose of the baseline inspection is to approve the site's WC program based on the demonstration that the program's components, with applicable conditions and limitations, can adequately characterize TRU wastes and comply with the regulatory requirements imposed on TRU wastes destined for disposal at the WIPP. An EPA inspection team conducts an on-site inspection to verify that the site's system of controls is technically adequate and properly implemented. Specifically, EPA's inspection team verifies compliance with 40 CFR 194.24(c)(4), which states the following:

> *Any compliance application shall: . . . Provide information which demonstrates that a system of controls has been and will continue to be implemented to confirm that the total amount of each waste component that will be emplaced in the disposal system will not exceed the upper limiting value or fall below the lower limiting value described in the introductory text of paragraph of this section.*[2] *The system of controls shall include, but shall not be limited to: measurement; sampling; chain of custody records; record keeping systems; waste loading schemes used; and other documentation.*

[1] As of the FR notice of July 16, 2004, EPA has replaced the term *process knowledge* with *acceptable knowledge*. Acceptable knowledge refers to any information about the process used to generate waste, material inputs to the process, and the time period during which the wastes were generated, as well as data resulting from the analysis of waste conducted prior to or separate from the waste certification process authorized by an EPA certification decision to show compliance with Condition 3 of the certification decision.

[2] The introductory text of 40 CFR 194.24(c) states, "For each waste component identified and assessed pursuant to [40 CFR 194.24(b)], the Department shall specify the limiting value (expressed as an upper or lower limit of mass, volume, curies, concentration, etc.), and the associated uncertainty (i.e., margin of error) for each limiting value, of the total inventory of such waste proposed for disposal in the disposal system."

In other words, the purpose of the baseline inspection is to implement the requirements of 40 CFR 194 by assessing whether DOE sites that characterize TRU waste prior to disposal at the WIPP are capable of characterizing and tracking the waste. EPA may also conduct follow-up inspections to address issues remaining from the baseline inspection or to seek further clarification/discussion related to WC processes evaluated during a baseline inspection. By approving the WC systems and processes at INL-CCP applied to retrievably-stored RH debris waste, EPA confirms that the Agency has evaluated the capabilities of systems and processes implemented by a site to accomplish two tasks: (1) the identification and measurement of waste components (such as plutonium (Pu)) that must be tracked for compliance,[3] and (2) the confirmation that the waste in any given container has been properly identified as belonging to the group of approved waste streams.

Based on the adequacies of the WC processes demonstrated during the baseline inspection, including all conditions and limitations, EPA specifies which subsequent WC program changes or modifications must undergo further EPA inspection or approval under 40 CFR 194.24. This is accomplished by assigning a tier level to each aspect of the characterization program, i.e., T1 and T2 activities. T1 activities have more stringent reporting and EPA notification requirements and require EPA approval prior to implementation. T2 activities are reported to EPA based on the frequency established in the inspection report. DOE may choose to characterize and dispose of the waste from T2 activities at risk while EPA considers the T2 changes. If INL-CCP contemplates a change that is not identified in this report, EPA recommends that the site, in consultation with CBFO, discuss the nature of the change with EPA. This would minimize the possibility of EPA not approving the site-assigned tiers. The rule applying to this baseline inspection can be found in the FR (Vol. 69, No. 136, pp. 42571–42583, July 16, 2004).

Following EPA's approval of WC processes evaluated during the baseline inspection, EPA can conduct additional inspections to evaluate and approve, if necessary, changes to the site's approved WC program under the authority of 40 CFR 194.24(h). Under 40 CFR 194.24, EPA also has the authority to conduct continued compliance inspections to verify that the site continues to use only the approved WC processes to characterize the waste and remains in compliance with all the regulatory requirements.

3.0 PURPOSE OF THIS REPORT

This report documents the basis for EPA's approval decision and explains the results of Baseline Inspection No. EPA-INL-CCP-RH-6.06-8 in terms of findings or concerns. Specifically, this report does the following:

[3] The potential contents of a single waste stream or group of waste streams determine which processes can adequately characterize the waste. For example, if AK suggests that the waste form is heterogeneous, the site should select the matrix-appropriate radiological characterization technique to obtain adequate radionuclide measurements. VE serves to confirm and quantify waste components, such as cellulosics, rubbers, plastics, and metals. Once the nature of the waste has been confirmed, characterization techniques quantify selected radionuclides in the waste. In some cases, a TRU waste generator site may be able to characterize a range of heterogeneous waste streams or only a few. A site's stated limits on the applicability of proposed WC processes govern the scope of EPA's inspection.

- Describes the characterization systems proposed for approval
- Provides objective evidence of the approval basis for all WC systems
- Identifies all relevant limitations and or conditions for each WC system
- Provides objective evidence of outstanding findings or concerns in the form of documentation, as applicable
- Describes any tests or demonstrations completed during the course of the inspection and their relevance to EPA's approval decision

The completed checklists attached to this report in conjunction with the listings in each section reference the documents that the EPA inspection team members reviewed in support of the technical determination. To see or obtain copies of any items identified in the attached checklists, write to the following address:

Quality Assurance Manager
USDOE/Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221

EPA's final approval decision regarding the INL-CCP WC program is conveyed to DOE separately by letter. This information is also available on EPA's Web site at http://www.epa.gov/radiation/WIPP, in accordance with 40 CFR 194.8(b)(3).

4.0 SCOPE OF INSPECTION

The scope of Baseline Inspection No. EPA-INL-CCP-RH-6.06-8 included the technical adequacy of the WC systems in use at INL-CCP to characterize RH TRU wastes. These systems were evaluated with respect to their ability to perform the following:

- Identify and quantify the activities of the 10 WIPP-tracked radionuclides (^{241}Am, ^{137}Cs, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{242}Pu, ^{90}Sr, ^{233}U, ^{234}U, and ^{238}U) using a combination of AK and radiological characterization, including DTC and radionuclide scaling factors derived from modeling
- Assign waste material parameters (WMPs) correctly using VE for RH retrievably-stored debris waste

Specifically, these systems consisted of the following components:

- The AK process that supports retrievably-stored S5000 debris wastes from one (1) RH debris waste stream (INL Waste Stream No. ID-ANLE-S5000, Lots 1 through 20)
- The system of radiological characterization including DTC and the application of radionuclide scaling factors derived by modeling for one RH debris waste stream (INL Waste Stream No. ID-ANLE-S5000)
- VE for retrievably-stored S5000 RH debris wastes

During an inspection, EPA does not approve characterization data; that function is the sole responsibility of the site being evaluated during the inspection, in this case INL-CCP. EPA evaluated the WC processes implemented by the site to characterize RH retrievably-stored debris waste. The evaluation consists of interviewing personnel, observing equipment operations that are controlled through site procedures, and inspecting records related to each of the WC processes within the inspection's scope. An important aspect of this evaluation is the objective evidence that documents the effectiveness of the WC processes. Objective evidence typically takes the form of BDRs for radiological characterization and VE, AK accuracy reports, and VE tapes. During an inspection, EPA typically selects samples of each of these items, based on the number and variety of items that were completed and available for each WC process, consistent with standard auditing techniques. Because the RH TRU characterization program is new, there was initially only one completed BDR for VE and radiological characterization available for the EPA inspection team's evaluation. By the end of the inspection process, INL-CCP had produced two more VE BDRs for a total of three. The EPA inspection team evaluated all of the drums in the three VE packages and the one radiological characterization package. Based on the evaluation of the WC processes in conjunction with the objective evidence, EPA determined the technical adequacy of the WC processes within the inspection's scope.

5.0 INSPECTION-RELATED DEFINITIONS

During the course of an inspection, EPA inspectors may encounter items or activities that require further inquiry for their potential to adversely affect WC and/or isolation within the repository. The two main categories relevant to WC inspections are identified below:

Finding: A determination that a specific item or activity does not conform to 40 CFR 194.24(c)(4). A finding requires a response from CBFO.

Concern: A judgment that a specific item or activity may or may not have a negative effect on compliance and, depending on the magnitude of the issue, may or may not require a response. (Concerns not requiring a response do not have to be addressed prior to program approval.)

6.0 PERSONNEL

6.1 EPA Inspection Team

The members of the EPA WC inspection team are identified in Table 2.

Table 2. EPA Inspection Team Members

Inspection Team Member	Position	Affiliation
Ms. Rajani Joglekar	Inspection Team Leader	U.S. EPA ORIA
Mr. Ed Feltcorn	Inspector	U.S. EPA ORIA
Ms. Connie Walker	Inspector	S. Cohen & Associates, Inc.
Ms. Dorothy Gill	Inspector	S. Cohen & Associates, Inc.
Mr. Patrick Kelly	Inspector	S. Cohen & Associates, Inc.

6.2 Personnel Contacted

EPA and its support personnel conducted interviews with INL-CCP personnel in several disciplines. The personnel contacted represented a sample of the CH TRU WC staff, and they are listed in Table 3, along with their affiliation and technical area.

Table 3. Personnel Contacted During Inspection

Personnel	Affiliation	Area of Expertise
Eric D'Amico	CCP	AK, DTC, SPM
Jene Vance	CCP	AK/DTC; Scaling Factors-MS Data
Lisa Price	CCP	AK, AKE
Larry Porter	CCP	AK, SPM; Scaling Factors-MS Data
Steve Schafer	CCP	AK, AKE
Kevin Peters	CCP	AK, AKE
Lee Smith	CCP	RTR, SME & Operator
Ed Gulbransen	CCP	DTC, SME
Mark Doherty	CCP/WTS	DTC & Scaling Factors-MS Data
Joe Harvill	CCP/WTS	DTC & Scaling Factors
Keith B. Farmer	CWI	DTC, Nuclear Facility Manager
Ken Pierce	CWI	DTC, Shift Manager
Chris Davis	CWI	DTC, Dose-Rate Operator
Suay Andrews	CWI	DTC, Dose-Rate Operator
Mark Hawker	CWI	DTC, Rad Con Technician
Swami Raman	CCP	VE, Operator/ITR
Tommy Mojica	CCP	Operator/ITR, SME/OJT, VEE
Patrick Boyd	CCP	Operator/ITR
John Hegsted	CCP	Operator/ITR
Irene Quintana	WTS	SPM

During the baseline inspection, INL-CCP provided a list of RH TRU WC personnel from which EPA selected the individuals to be interviewed. The EPA inspectors reviewed the qualifications and training records of these individuals relative to their WC responsibilities. Based on this evaluation, EPA determined that INL-CCP WC personnel responsible for characterizing RH TRU waste and certifying it as TRU waste were qualified and had received adequate training to perform their assigned function. If key WC personnel changes occur, EPA may request qualification and training records of the new individuals identified as key WC personnel. EPA will review these records and may interview the personnel to determine their abilities to produce quality data. This personnel qualification evaluation and review of training records would be the equivalent of the evaluation done by the EPA inspection team on site during this inspection.

7.0 PERFORMANCE OF THE INSPECTION

Site Background and History

INL is located in southeastern Idaho, about 60 miles outside of Idaho Falls, Idaho. The site encompasses approximately 890 square miles. The U.S. government established INL in 1949 as the National Reactor Testing Station, and its original mission was the design, construction, and

testing of prototype nuclear reactors. Over the years, site activities have shifted from reactor development to multi-program research, hazardous and radioactive waste management and cleanup, and the development of environmental technologies. In January 1997, the site, then known as the Idaho National Engineering Laboratory (INEL), changed its name to the Idaho National Engineering and Environmental Laboratory (INEEL) to highlight its role in developing waste cleanup and other environmental technologies. In February 2005, the site's name was changed to the Idaho National Laboratory (INL)[4] to better reflect its role in the development of nuclear-related technologies.

The 2004 Compliance Recertification Application[5] states that there are eight individual RH waste streams currently in storage at INL. These wastes originated from a variety of DOE generators, including Argonne National Laboratory-East (ANL-E) and Argonne National Laboratory-West (ANL-W), Battelle Columbus Laboratories, and INL[6]. The wastes are expected to consist primarily of debris, including metal waste, laboratory wastes, Pu-neutron source metallic wastes and heterogeneous debris; one RH sludge waste stream is identified. INL has approximately 202 cubic meters (m^3) of RH TRU waste in storage, and it is projected that no additional RH waste streams will be generated. It is worth noting that the number of actual waste streams may change as a function of the requirements of the WC Program Implementation Plan (WCPIP).

Inspection Process Overview

EPA Inspection No. EPA-INL-CCP-RH-6.06-8 occurred in three segments:

- On-site inspection at INL on June 12–16, 2006
- Follow-up inspection on August 9, 2006, at DOE's CBFO for the purpose of assessing mass spectrometry data used to support one element of the INL-CCP RH WC program
- Follow-up inspection at DOE's CBFO on August 29, 2006, for the purpose of resolving open issues from the above-listed inspections

The inspection had the scope described in Section 4.0, above, for the purpose of determining the site's compliance with 40 CFR 194.24. The inspection was conducted in the following steps:

(1) Obtaining and reviewing site procedures, reports, and other technical information related to RH WC activities at INL-CCP in advance of the inspection

(2) Preparing draft checklists and technical questions specific to WC areas prior to the inspection, as appropriate

[4] Documentation cited in this report may bear an identification number from INL, INEEL, or INEL, depending on the document's time of generation. These distinctions are not significant.

[5] Appendix data, Attachment F, Annex J

[6] As a result of the incorporation of the facility formerly known as ANL-W into INL, the facility in Argonne, Illinois, that was formerly known as ANL-E is now called ANL. The ANL-W facility is now called the Materials and Fuel Complex. The terms ANL-E and ANL-W may be used in this report to maintain consistency with specific references.

(3) Evaluating INL-CCP's implementation of WC processes for adequacy and demonstrating compliance with 40 CFR 194.24 requirements

(4) Participating in several conference calls with CBFO technical support contractors to brief the EPA inspection team members regarding technical details related to the INL-CCP RH WC program

(5) Interacting with CBFO and INL-CCP personnel to arrange inspection logistics

(6) Conducting initial baseline inspection visit at INL-CCP to verify the technical adequacy or qualifications of RH WC personnel, procedures, processes, and equipment by means of interviews, observation, and demonstrations, and recording the results

(7) Making one follow-up visit to CBFO headquarters in Carlsbad, New Mexico, to perform an independent technical evaluation of analytical data used to support the development of radionuclide scaling factors

(8) Making one follow-up visit to CBFO headquarters in Carlsbad, New Mexico, to complete the evaluation of specific RH WC technical aspects

(9) Holding ongoing technical discussions between members of the EPA inspection team and INL-CCP technical support contractors for the purpose of clarifying technical aspects of the RH WC program

(10) Recording all concerns on EPA issue-tracking forms, which were completed and provided to CBFO and site personnel as they were generated (see Attachment B)

(11) Communicating all pertinent information with CBFO and INL-CCP personnel on site and in other meetings, as appropriate

(12) Pursuing resolution of all identified issues prior to completion of the inspection and after the inspection by discussions with CBFO and INL-CCP personnel

(13) Conducting entrance, exit, and daily briefings for CBFO and INL-CCP management personnel at INL and CBFO, as appropriate

(14) Preparing the draft inspection report

8.0 TECHNICAL WASTE CHARACTERIZATION AREAS

8.1 Acceptable Knowledge

EPA examined the AK process and associated information to determine whether the INL-CCP RH program demonstrated compliance with 40 CFR 194.8 requirements for RH retrievably-stored debris waste.

Waste Characterization Element Description

As part of the inspection, EPA reviewed the following with respect to the use of AK for WC:

- Waste stream definition and identification, including radiological content
- Identification of high-level waste, TRU versus non-TRU, spent nuclear fuel

- Role of AK in the characterization methodology (including alternative characterization methods related to AK)
- Compilation of AK documentation and assembly of required information
- Adequacy of WCPIP AK process implementation and AK Summary Report
- AK data traceability
- AK source document sufficiency
- WCPIP interpretation with respect to AK qualification
- Confirmatory Test Plan preparation and plan adequacy
- Characterization Reconciliation Report preparation and report adequacy
- Correlation and Surrogate Summary Form and contact-handled (CH)-RH correlation
- Personnel training
- Traceability of mass spectrometry data used to support radionuclide scaling factors
- Nonconformance reports (NCRs) and AK discrepancy resolution
- AK accuracy
- Implementation of load management
- Identification of the method for determining data quality objectives (DQOs) including those to be attained by AK qualification
- Attainment of DQOs

The checklist included as Attachment A.1 identifies the objective evidence reviewed by the EPA inspector. AK is used to provide information regarding several aspects of TRU wastes at INL-CCP, including the following:

- Defense waste status
- Material parameters
- Waste stream
- Radionuclide composition
- Waste matrix codes (WMCs)

Documents, Waste Containers, and Batch Data Reports Reviewed

- DOE/WIPP-02-3214, Remote Handled TRU Waste Characterization Program Implementation Plan, Revision 0D, October 30, 2003
- DOE/WIPP-02-3122, Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plan, Revision 5, effective date TBD
- CCP-PO-002, CCP Transuranic Waste Certification Plan, Revision 16, approved May 8, 2006
- CCP-QP-002, CCP Training and Qualification Plan, Revision 20, effective date May 3, 2006
- CCP-AK-INL-500, Central Characterization Project Acceptable Knowledge Summary Report for Remote-Handled Transuranic Debris Waste from Argonne National Laboratory-East Stored at the Idaho National Laboratory, Waste Stream ID-ANLE-S5000, Revision 2, June 1, 2006 and Revision 3, July 7, 2006

- CCP-AK-INL-501, Central Characterization Project Remote-Handled Transuranic Radiological Characterization Technical Report for Remote-Handled Transuranic Debris Waste from Idaho National Laboratory, Revision 1, June 6, 2006
- CCP-AK-INL-502, Central Characterization Project Confirmatory Test Plan for Waste Stream: ID-ANLE-S5000, Revision 0, May 5, 2006
- CCP-AK-INL-502, Central Characterization Project Confirmatory Test Plan for Waste Stream ID-ANLE-S5000, Revision 1, May 31, 2006
- CCP-TP-506, CCP Preparation of the Remote-Handled Transuranic Waste Acceptable Knowledge Characterization Reconciliation Report, Revision 1, effective date May 5, 2006
- Interoffice correspondence (for audit demonstration purposes only), to I. Quintana from A.J. Fisher, Acceptable Knowledge Accuracy Report: Idaho National Laboratory Waste Stream Number ID-ANLE-S5000 Lot 1, June 8, 2006
- EDF-6946, Engineering Design File Project No. 23048, Identification of Additional Fuel Elements/Materials Examined in the Alpha Gamma Hot Cell Facility for ANL-E TRU Waste, Revision ID:0, effective date May 19, 2006
- FUEL PIN data source documents (CD), provided June 2006
- P593, Engineering Design File, Quantifying Special Actinides in RH-TRU Waste from Irradiated Fuel Examined at ANL-E, EDF-2555, Revision 0, December 16, 2002
- P592, Evaluation of Radionuclide contents in RH-TRU Waste Drums 728 through 737 Based on Reported Irradiated Fuel Examination INEEL/EXT-02-00168, Revision 0, September 2003
- Fuel Element Examination Sheets (Fuel Element Examined at Argonne National Laboratory), AG Nos. 421A, 429A
- Drum number list, Waste Stream INL-ANL-E-S5000, provided June 2006
- EDF-6685, Engineering Design File, Project No. 23048, Information on Fuel Elements Examined at the AGHCF[7] at ANL from November 1971 to August 7, 1995, Based on Waste Consolidation Records, Revision ID:0, effective date May 19, 2006
- Characterization Reconciliation Report (CRR), draft, for Waste Stream CRR-INL-AGHCF-S5000-001 and for Waste Stream ID-ANLE-S5000, June 9, 2006
- AK Qualification Card, Kevin Peters, August 6, 2003
- NCR-RHINL-0004-06, Revision 0 (note reason for NCR not provided on sheets)
- Waste Can Inventory Sheets, Can Nos. 105, 107, and 108, March 31, 1993
- Waste Package Data Sheet, Drum Nos. 00739 (top can 107, bottom can 105), April 22, 1993
- Waste Can Inventory Sheets, Can Nos. 118 and 119, March 26, 1993
- Waste Package Data Sheet, Drum Nos. 00743 (top can 118, bottom can 119), April 30, 1993

[7] AGHCF is the Alpha-Gamma Hot Cell Facility at ANL-E.

- Waste Package Data Sheet, Drum Nos. 00742 (top can 117, bottom can 115), April 30, 1993
- Waste Can Inventory Sheets, Can Nos. 117 and 115, April 30, 1993
- Waste Package Data Sheet, Drum Nos. 00741 (top can 110, bottom can 112), April 23, 1993
- Waste Can Inventory Sheets, Can Nos. 110 and 112, April 2, 1993
- Waste Package Data Sheet, Drum Nos. 00740 (top can 109, bottom can 108), April 23, 1993
- Waste Can Inventory Sheet, Can No. 109, April 2, 1993
- Waste Package Data Sheet, Drum No. 00738 (top can 102, bottom can 104), April 17, 1993
- Waste Can Inventory Sheets, Can Nos.102 and 104, April 1, 1993 (camera was off for No.104)
- DR11, Waste Requisition and Video Discrepancies, June 13, 2006
- DR10, Discrepancy Resolution Regarding the Volume of 7-Gallon Waste Cans, K. Peters, June 6, 2006
- Source Documents Reference List (CCP-TP-005, Revision 17, Attachment 4), June 13, 2006
- Sample/Fuel Element and Other AK Data for Index 293 (see EDF-6685, Revision 11, page 23)
- Data for AG No. 421A, UBA-15, end installation date April 19, 1990
- ICP/EXT-05-0886, Project 23048, ILTSG Drum Retrieval Completion Report, Revision 0, October 2005
- ID-ANLE-S5000, Draft Waste Stream Profile Form for Audit Purposes Only, June 2006
- DTC BDR and related attachments: (1) CCP-TP-504, Revision 2, Attachment 8, SPM Checklist for BDR INL RH DTC 06001; (2) CCP-QP-005, CCP NCR Report RHINL-0500-06, for containers 00745 and 00746 (with container rejected because dose rate less than 10 times background), Revision 10; (3) CCP-TP-504, Revision 2, Attachment 4, BDR Cover Sheet INL RH DTC 06001; Attachment 5, BDR Table of Contents; Attachment 6, BDR Narrative Summary; Attachment 7, ITR Review Checklist; Attachment 1, Measurement Control Reports (various dates); Attachment 2, Individual Container Data Sheets for Containers 771, 70, 73, 739, 743, 738, 742, 744, 747, 740, 741, 745, and 746; Waste Container Dose-to-Curie Conversion Record (same container numbers); (4) NCR-RHINL-0004-06, measured container dose rate not at least 10 times greater than background for Container 00763
- RH TRU Waste Correlation and Surrogate Summary Form for ID-ANLE-S5000, undated and unsigned
- Solid Radioactive Waste Disposal Requisition Date Sheets, various containers, provided June 2006
- C003, Intralaboratory Memorandum to H. Welsh Re: Dimensions of Intermediate TRU Waste Containers, prepared by D. Donahue, September 14, 1989

- P002, Central Characterization Project Acceptable Knowledge Report for Argonne National Laboratory-East Contact Handled TRU Waste Facility Maintenance and Laboratory Operations; CCP-AK-ANLE-001, Revision 11, December 31, 2003
- C024, Intralaboratory Memorandum to W.C. Kettman from L.A. Neimark IPR, Clarification of 00 No. 29 with Regard to Inventory of 8 Inch Storage Holes, December 7, 1993
- C058, Intralaboratory Memorandum to R. Boule from R. Ditch, Re: Needs Prior to Shipment of Neimark's TRU-RH Drums to Idaho, March 1, 1990
- C060, Intralaboratory Memorandum to R. Boule from A.C. Smith, Re: Status: Resumption of Shipments of TRU Waste to INEL, March 30, 1990
- C066, Record of Communication between B. Kettman and D. Donahue, Re: AGHCF Operations and Waste Packaging, recorded by J. Whitworth and M. Wyco, August 7, 2001
- C067, Record of Communication with F. Pausche and T. Bray, by J. Whitworth and M. Wyco, Re: Calculation of U/Pu Ratios in Waste Containers, August 8, 2001
- C084, Intralaboratory Memorandum to Building 212 Personnel, Re: Disposal of Solid Radioactive Waste, F.P. Marchetti, February 4, 1986
- C108, Correspondence to J.T. Case, USDOE Idaho Field Office from T.L. Clements, TLC-224, 92, Re: Strategy Plan for Long-Term Management and Storage of Remote-Handled (RH) Transuranic (TRU) Waste, November 30, 1992
- C121, Record of Communication with L. Neimark, A. Cohen, and F. Pausche by J. Whitworth and J. Biedscheld, and P. Kuan, R. Bhatt, and S. Kheriche, Re: ACHCF Radiological Characterization of RH-TRU Waste Shipped to INEEL, December 19, 2001
- C330, Memorandum to I. Triay, CBFO from F. Marcinowski, Determination and Findings, Defense Origin of Nuclear Waste, Kerr-McGee Waste, April 15, 2005
- C331, Memorandum to CCP Central Records from K. Peters, Re: Evaluation of Kerr-McGee Production and FFTF History, June 26, 2004
- C332, Memorandum to CCP Central Records from D.B. Becker, Re: Assessment of Waste Material Parameters for Waste Stream ID-ANLE-S5000, January 3, 2006
- C333, Memorandum to CCP Central Records from D.B. Becker, Re: Assessment of Waste Material Parameters for Waste Stream AERHDM, January 2006