



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

 ENTERED

JUL - 9 2013



Mr. J. R. Stroble  
Manager, National TRU Program  
Carlsbad Field Office  
U.S. Department of Energy  
P.O. Box 3090  
Carlsbad, NM 88221-3090

Dear Mr. Stroble:

On February 20, 2013, the U.S. Department of Energy (DOE), Carlsbad Field Office (CBFO) requested the U.S. Environmental Protection Agency (EPA) to approve, as a Tier 1 (T1) change, the addition of the following two contact-handled (CH) transuranic (TRU) debris waste types to the BN-510 waste stream. This waste is being characterized at the Advanced Mixed Waste Treatment Project's (AMWTP) by the Idaho Treatment Group (ITG):

- Direct shipment (uncompacted) and supercompaction of contact-handled (CH) debris [Summary Category Group (SCG) S5000]; and
- Direct shipment of homogenous solid waste (SCG S3000).

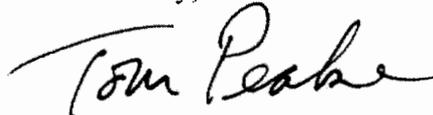
The T1 change request was only for the acceptable knowledge (AK) process being implemented by ITG at AMWTP, therefore, EPA review was limited to AK as discussed in the enclosed report (see EPA Docket No. A-98-49: II-A4-174). Per the October 3, 2006 baseline approval, no radiological and physical analyses of debris waste containers can occur until EPA approves AK for the debris waste containers from other TRU Sites (such as Hanford, LANL, ANLE and MFC) being added to the BN-510 waste originating at INL. With this approval of the AK, ITG may characterize physical and radiological contents of these two waste types using the equipment, processes and procedures that EPA approved during the October 2006 baseline approval (see EPA Docket No A-98-49: II-A4-66, October 3, 2006).

EPA's January 2013 approval of T1 changes for ANLE and MFC wastes required that NDA and NDE BDRs be submitted for EPA review prior to the first shipment of those wastes to Waste Isolation Pilot Plant (WIPP) for disposal. In this case, however, this requirement has been modified so that these BDRs can be submitted along with the Tier 2 changes AMWTP routinely submits on a quarterly basis. EPA has determined that ITG can adequately prepare BN-510 BDRs for recording radiological and physical contents of waste containers managed at the site. This determination was made at EPA's evaluation of NDA and NDE BDRs during the Continued Compliance Inspection of February 2013 and EPA's February 2013 review of the ANLE and MFC BDRs. Therefore, no BDR submission is necessary prior to the first shipment of the subject waste to WIPP for disposal.



If you have any questions regarding this approval, please contact Ed Feltcorn at (202) 343-9422 or Rajani Joglekar at (202) 343-9462.

Sincerely,

A handwritten signature in black ink that reads "Tom Peake". The signature is written in a cursive style with a long horizontal line extending from the top of the "T".

Tom Peake, Director  
Center for Waste Management and Regulations

Enclosure

cc: Electronic Distribution  
Joe Franco, CBFO  
Tom Morgan, CBFO NTP  
Marcus Pinzel, CBFO NTP  
Norma Castaneda, CBFO NTP  
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Ben Roberts, DOE ID  
Jerry Wells, DOE ID  
Dave Haar, AMWTP ITG  
Tim Hall, NMED  
Trais Kliphuis, NMED  
Raymond Lee, EPA HQ  
Site Documents

**DOCKET NO: A-98-49; II-A4-174**

**WASTE CHARACTERIZATION TIER 1 CHANGE REPORT:  
ADDITION OF CONTACT-HANDLED TRANSURANIC WASTE TO THE ADVANCED  
MIXED WASTE TREATMENT PROJECT APPROVED PROGRAM:  
PRE-1980 INL-EXHUMED SUBSURFACE DISPOSAL AREA  
SUMMARY CATEGORY GROUP S3000 AND S5000 WASTE**

**MAY 2013**

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

**July 2013**

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## ATTACHMENTS

Attachment A:	Approval Summary for Advanced Mixed Waste Treatment Project Contact-Handled Waste Characterization Program
Attachment B:	List of Documents Cited by EPA during the T1 Evaluation

## ABBREVIATIONS AND ACRONYMS

AK	acceptable knowledge
AKD	AK document
AKSR	AK summary report
Am	americium
AMWTP	Advanced Mixed Waste Treatment Project
ANLE	Argonne National Laboratory-East
BDR	batch data report
CBFO	Carlsbad Field Office
CFR	Code of Federal Regulations
CH	contact-handled
CIS	characterization information summary
DCR	document change request
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EWR	Early Waste Retrieval
HLW	high-level waste
IDC	item description code
IDR	Initial Drum Retrieval
INL	Idaho National Laboratory
INEL	Idaho National Engineering Laboratory
INEEL	Idaho National Engineering and Environmental Laboratory
ITG	Idaho Treatment Group, LLC
LWA	Land Withdrawal Act, as amended
MFC	Materials and Fuels Complex

nCi/g	nanocuries per gram
NDA	nondestructive assay
NDE	nondestructive examination
NWPA	Nuclear Waste Policy Act of 1982
PCB	polychlorinated biphenyl
Pu	plutonium
RFP	Rocky Flats Plant
RWMC	Radioactive Waste Management Complex
SCG	summary category group
SDA	Subsurface Disposal Area
SNF	spent nuclear fuel
T1	Tier 1
T2	Tier 2
TRU	transuranic
WAC	waste acceptance criteria
WAP	waste analysis plan
WIPP	Waste Isolation Pilot Plant
WMP	waste material parameter
WSPF	waste stream profile form

## 1.0 INTRODUCTION

This report supports the U.S. Environmental Protection Agency's (EPA's) approval of the proposed Tier 1 (T1) change to the EPA-approved transuranic (TRU) waste characterization program at the U.S. Department of Energy's (DOE's) Advanced Mixed Waste Treatment Project (AMWTP) at the Idaho National Laboratory (INL). This approval allows AMWTP to characterize pre-1980 INL-exhumed waste from two exhumations within the Subsurface Disposal Area (SDA) at INL: the Initial Drum Retrieval (IDR) and Early Waste Retrieval (EWR). This approval is for (a) direct shipment (waste in uncompact containers) and supercompaction of containers with contact-handled (CH) debris [Summary Category Group (SCG) S5000] and (b) direct shipment of homogenous solid waste (SCG S3000). Both exhumations also generated soil (SCG S4000) during excavation, but DOE anticipates that this soil will not be TRU waste; therefore, this approval does not include S4000 waste.

In accordance with Title 40 of the Code of Federal Regulations (40 CFR) 194.8(b), EPA conducted Baseline Inspection No. EPA-AMWTP-03.06-8 of the waste characterization program at AMWTP on March 28–30 and April 11–13, 2006. EPA's October 2006 baseline approval applied to (a) CH retrievably-stored SCG S3000 and SCG S5000 waste and (b) newly-generated SCG S5000 CH waste. The AMWTP baseline final inspection report (see EPA Docket No. A-98-49; II-A4-66, dated October 2006) documents EPA's approval of the acceptable knowledge (AK) and load management processes and several nondestructive assay (NDA) and nondestructive examination (NDE) systems for use in characterizing CH retrievably stored SCG S3000 and SCG S5000 waste and newly generated SCG S5000 waste. The baseline report defined inclusion of wastes from sources other than Mound Site, Rocky Flats Environmental Technology Site [or the Rocky Flats Plant (RFP)], Battelle Columbus Laboratories, and Bettis Atomic Power Laboratory (hereafter referred to as "Bettis") as an AK T1 change that required EPA approval before implementation. Wastes from the DOE sites listed above were specifically evaluated as part of the baseline inspection. Attachment A provides a table listing EPA's approvals of the AMWTP CH TRU waste characterization program.

On February 20, 2013, the Carlsbad Field Office (CBFO) requested EPA's approval of the addition of pre-1980 INL-exhumed SDA CH waste from SCGs S3000 and S5000 to the AMWTP baseline approval as a T1 change. EPA limited the scope of this review to the AK and load management processes. The review was necessary to determine whether AMWTP's AK documentation and records adequately include and cross-reference available historical waste generation and disposal records supporting inclusion of two categories of pre-1980 waste from two pre-1980 waste exhumations from the SDA at INL.

This evaluation did not consider the following waste characterization activities:

- Use of EPA-approved NDA and NDE processes to characterize these wastes. Upon generating two to three NDA and NDE batch date reports (BDRs) for these waste containers, AMWTP must provide these BDRs at the end of the quarter along with the quarterly submission of Tier 2 (T2) changes. EPA has required submission of NDA and NDE BDRs for those CH TRU wastes that EPA approved as T1 approvals since the baseline approval of October 2006.

- AK procedural adequacy, AMWTP procedural compliance, or drum or data traceability. EPA evaluated these elements as part of AMWTP's continued compliance evaluation which occurred on October 30–November 1, 2012. (See EPA Docket No. A-98-49; II-A4-173).

EPA did not identify any findings or concerns during this review. Based on this evaluation, EPA approves the addition of the specified pre-1980 INL-exhumed SDA SCG S3000 and SCG S5000 CH waste to AMWTP's EPA-approved program.

EPA's evaluation required certain changes to RPT-TRUW-91, Revision 0, "Acceptable Knowledge Document for Pre-1980 INL-Exhumed SDA Waste" [hereafter referred to as the AK document (AKD)]. AMWTP provided a document change request (DCR) for the revised AKD to EPA before the conclusion of this T1 evaluation. **EPA expects final versions of the following documents to be submitted as part of AMWTP's next quarterly submission (no later than the fiscal year 2013 fourth quarter submission) of T2 changes to EPA for review and concurrence:**

- RPT-TRUW-06, Revision 15.
- RPT-TRUW-07, Revision 19.
- RPT-TRUW-12, Revision 20.
- RPT-TRUW-83, Revision 6.
- RPT-TRUW-91, Revision 1.

Based on this evaluation, there is one substantive change to the AK T1 designations: pre-1980 INL-exhumed SDA waste as defined in RPT-TRUW-91 has been added to the list of approved waste sources. There are two substantive changes to the AK T2 designations: (1) addition of AMWTP AK document RPT-TRUW-06 and supercompacted Waste Stream BN510.1 AK summary report (AKSR) RPT-TRUW-83 to the list of example AKSRs and generator-site-specific AK documents and (2) notification to EPA upon completion of or revision to any item description code (IDC) inclusion memoranda. EPA also revised the tiering table to ensure completeness and consistency with recent EPA T1 approval reports. Table 1 shows the substantive T1 and T2 changes in bold text. T1 and T2 changes that were initiated during the baseline and subsequent T1 approvals remain in effect. The language in Table 1 regarding AK documentation applies to all AMWTP waste streams, including load-managed and direct-shipped waste streams.

This approval allows AMWTP to characterize the physical and radiological contents of containers for the pre-1980 INL-exhumed SDA SCG S3000 and SCG S5000 CH waste using the equipment, processes and procedures EPA approved as part of the baseline approval (see EPA Docket No. A-98-49; II-A4-66, October 3, 2006). As stated above, EPA requires submission of NDA and NDE BDRs for the subject wastes along with the applicable quarterly T2 submissions. This is different from EPA's requirement that the NDA and NDE BDRs for ANLE and MFC wastes be provided prior to the first shipments of these wastes (see EPA Docket No. A-98-49; II-A4-169, January 29, 2013). This is due to EPA's determination, based on reviews conducted during EPA's Continued Compliance Inspection of February 2013 and review of the ANLE and MFC BDRs received in February 2013, that AMWTP can adequately prepare BN-510 BDRs recording the radiological and physical contents of waste containers managed by the site. EPA

also requires that if SNF or HLW is identified during characterization of the pre-1980 INL-exhumed SDA waste, AMWTP will immediately notify EPA and provide EPA with information describing management of the identified SNF or HLW.

This report serves as EPA's public notification of the approval of this T1 change. This information will be provided through the EPA website and by sending emails to the WIPPNEWS list, in accordance with 40 CFR 194.8(b)(3).

**Table 1. Tiering of CH TRU Waste Characterization Processes Implemented by AMWTP  
(Based on March 28–30 and April 11–13, 2006, Baseline Inspection and Subsequent T1 Evaluations, Updated July 2013)**

Process Elements	AMWTP CH Waste Characterization Processes – T1 Changes	AMWTP CH Waste Characterization Processes – T2 Changes*
Acceptable Knowledge, including Load Management	<p>Any new waste category</p> <p>Any waste from sources other than the Mound Site, Rocky Flats Environmental Technology Site, Battelle Columbus Laboratories, Bettis Atomic Power Laboratory, Argonne National Laboratory-East, the Materials and Fuels Complex, <b>and pre-1980 INL-exhumed Subsurface Disposal Area waste</b></p> <p>Load management of any new or unapproved waste stream</p>	<p>Notification to EPA upon completion of or substantive modification** to:</p> <ul style="list-style-type: none"> <li>• Implementation of procedures and related documentation that formalize NDA-AK communication requirements</li> <li>• AK accuracy reports (annually, at a minimum)</li> <li>• All final WSPFs with related attachments (e.g., CIS), including updates or additions to waste streams within approved SCGs and summaries of radiological data for those containers included on the CIS drum list</li> <li>• New and revised AKSRs and generator-site-specific AK documents (e.g., RPT-TRUW-79, RPT-TRUW-89, <b>RPT-TRUW-06, RPT-TRUW-83</b>)</li> <li>• <b>Item description code inclusion memoranda</b></li> <li>• The load management status of approved waste streams</li> <li>• Site procedures requiring CBFO approval</li> <li>• Any waste identified outside of the waste profiles included in the 2002 Transuranic Waste Baseline Inventory Report, when applicable</li> <li>• RPT-TRUW-05, RPT-TRUW-07 and RPT-TRUW-12</li> </ul>
Nondestructive Assay	<p>New equipment or substantive physical modifications to approved equipment**</p> <p>Extension of or changes to the approved calibration range for approved equipment</p>	<p>Notification to EPA upon substantive modification** to:</p> <ul style="list-style-type: none"> <li>• Site procedures requiring CBFO approval</li> <li>• Software for approved equipment</li> <li>• Operating ranges upon CBFO approval</li> </ul>
Real-Time Radiography	None	<p>Notification to EPA upon:</p> <ul style="list-style-type: none"> <li>• Substantive modification** to site procedures requiring CBFO approval</li> <li>• New equipment or substantive physical modifications** to approved equipment</li> </ul>
Visual Examination and Visual Examination Technique	Changes in the vendor performing visual examination or visual examination technique	<p>Notification to EPA upon:</p> <ul style="list-style-type: none"> <li>• Substantive modification** to site procedures requiring CBFO approval</li> <li>• Addition of a new waste category</li> <li>• Addition of a new procedure or site equipment identifier</li> </ul>
WIPP Waste Data System	Changes to Waste Data System algorithms specific to load management	<p>Notification to EPA upon substantive modification** to:</p> <ul style="list-style-type: none"> <li>• Site procedures requiring CBFO approval</li> <li>• The load management status of approved waste streams</li> </ul>

New T1s, T2s and significant modifications to existing T1s or T2s are in **bold** text; T1s or T2s that were only revised for style are not shown in bold.

\* AMWTP will report all T2 changes to EPA every three months.

\*\* “Substantive modification” refers to a change with the potential to affect AMWTP’s CH waste characterization processes or documentation of them, excluding changes that are solely related to the environment, safety and health; nuclear safety; or the Resource Conservation and Recovery Act; or that are editorial in nature or are required to address administrative concerns. EPA may request copies of new references that DOE adds during a document revision.

## **2.0 PURPOSE OF TIER 1 EVALUATIONS**

Certain changes to the waste characterization activities from the date of the site's baseline inspection must be reported to and, if applicable, approved by EPA according to the tiering requirements set forth in 40 CFR 194.8 and incorporated into the AMWTP CH baseline final report (see EPA Docket No. A-98-49; II-A4-66).

Under the changes to 40 CFR 194.8 promulgated in the July 16, 2004, Federal Register notice (Vol. 69, No. 136, pages 42571–42583), EPA must perform a single baseline inspection of a TRU waste generator site's waste characterization program. The purpose of EPA's baseline inspection is to approve the site's waste characterization 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 Waste Isolation Pilot Plant (WIPP).

Following EPA's baseline approval, EPA is authorized to evaluate and approve changes, if necessary, to the site's approved waste characterization program by conducting additional inspections under the authority of 40 CFR 194.24(h). Changes requiring EPA notification and approval prior to implementation (T1 changes) and those requiring post-implementation notification (T2 changes) are identified in the site-specific baseline inspection reports. When evaluating proposed T1 changes for approval, EPA may conduct a site inspection to observe implementation of the change or can opt to conduct a desktop review of information provided specific to a change. DOE may choose to characterize and dispose of any previously approved TRU waste using processes, procedures or equipment implemented as T2 changes at risk of subsequent EPA disapproval. EPA reviews T2 changes on a quarterly basis and will conduct continued compliance inspections to evaluate implemented T2 changes to verify their adequacy.

## **3.0 PURPOSE OF THIS REPORT**

This report presents the technical basis for and results of EPA's evaluation of the addition of SCG S3000 and SCG S5000 pre-1980 INL-exhumed SDA CH TRU waste to AMWTP's baseline approval as a T1 change. EPA's approval of pre-1980 INL-exhumed SDA SCG S3000 and SCG S5000 waste for characterization for emplacement at the WIPP has been conveyed to DOE separately by letter. EPA will also announce the decision on its website at [www.epa.gov/radiation/wipp](http://www.epa.gov/radiation/wipp), in accordance with 40 CFR 194.8(b)(3).

DOE documents that EPA reviewed for this evaluation are cited in different sections throughout the report and are listed in Attachment B. Any of these documents can be requested from the following address:

Manager, National TRU Program  
Carlsbad Field Office  
U.S. Department of Energy  
P O Box 3090  
Carlsbad, NM 88221-3090

#### 4.0 SCOPE OF THIS TIER 1 EVALUATION

The scope of this T1 evaluation was the addition of SCG S3000 and SCG S5000 pre-1980 INL-exhumed SDA CH waste to the AMWTP baseline approval as a T1 change. EPA determined the scope of its review in part based on the knowledge that AMWTP expects to supercompact all of the pre-1980 INL-exhumed SDA SCG S5000 waste and segregate most if not all of the SCG S3000 waste to existing RFP waste streams. EPA limited the scope of this review to the AK and load management processes to determine whether AMWTP's pre-1980 INL-exhumed SDA AKD and records are sufficient to support inclusion of the pre-1980 INL-exhumed SDA SCG S3000 and SCG S5000 waste in the approved program. This review did not address AK, NDA or NDE procedural adequacy, AMWTP procedural compliance, or NDA and NDE equipment because EPA evaluated these elements during its continued compliance evaluation of AMWTP on October 30–November 1, 2012, and February 26, 2013 (EPA Docket No. A-98-49; II-A4-173).

#### 5.0 TIER 1 EVALUATION PERSONNEL

EPA and its support personnel conducted interviews with AMWTP personnel by telephone. Table 2 lists the EPA evaluation team members and the AMWTP personnel contacted, with their affiliations and function. This list includes personnel present at meetings conducted as part of this evaluation.

**Table 2. Tier 1 Evaluation Personnel**

<b>Name</b>	<b>Affiliation &amp; Function</b>
Rajani Joglekar	Lead Inspector, EPA
Ed Feltcorn	Inspector, EPA
Connie Walker	Technical Evaluator – Acceptable Knowledge, SC&A
Patrick Kelly	Technical Evaluator – Acceptable Knowledge/Radiological, SC&A
Tim Venneman	Acceptable Knowledge Expert, AMWTP-ITG <sup>1</sup>
Steve Carpenter	Acceptable Knowledge Expert, AMWTP-ITG
George Byram	TRU Programs Manager, AMWTP-ITG

#### 6.0 TECHNICAL EVALUATION OF ACCEPTABLE KNOWLEDGE AND LOAD MANAGEMENT

##### 6.1 Subsurface Disposal Area Waste-Generating Activities

The SDA at INL was used from the mid-1950s to 1970 for disposal of waste from various DOE and non-DOE sites. Waste has been and is currently being retrieved from the SDA for subsequent storage and ultimate post-characterization shipment to WIPP. This T1 encompasses wastes exhumed from the INL SDA before 1980; specifically, drums from two retrieval activities: the 1974–1978 INL IDR project and the 1976–1978 INL EWR project. The IDR and EWR projects exhumed approximately 18,841 containers, including both 55-gallon and 30-gallon drums. The exhumed wastes were overpacked into cargo containers, fiberglass boxes, M-

<sup>1</sup> In October 2011, Idaho Treatment Group (ITG), a DOE CBFO contractor, took over AMWTP's TRU waste characterization program from the previous contractor.

III bins (Department of Transportation 7A steel bins) or 83- or 85-gallon drums. The containers were shipped to the Transuranic Storage Area-Retrieval Enclosure and placed into retrievable storage. The majority of containers were exhumed during the IDR project (18,024 containers), 91% of which were intact. Of the approximately 820 containers exhumed during the EWR project, approximately 30% were intact (References C1069A, P652S, P653S, P654S, P655S, P664A, P753A, P1404A, P1411S, P1412S, RPT-TRUW-05 and RPT-TRUW-91, Revision 1).

Waste from the IDR project originated from Pits 11 and 12, while EWR-project waste originated from Pits 1 and 2, Trenches 1, 5, 7 and 8, and possibly Pits 9 and 10. The AKD states that pits were predominantly used for the disposal of RFP waste, while trenches were used to dispose of INL-generated or non-RFP offsite waste. AMWTP representatives stated that they cannot verify with certainty the generator sites that contributed to the IDR- and EWR-project waste, although RFP is suspected to be the main contributor based on overall SDA information (References C842S, P443A, P647A, P758A, RPT-TRUW-07, Revision 19a, and RPT-TRUW-12, Revision 20C).

## **6.2 Documents Provided**

EPA evaluated the AMWTP documentation that supported inclusion of the SCG S3000 and SCG S5000 pre-1980 INL-exhumed SDA CH waste in AMWTP's approved characterization program. Attachment B lists all documentation cited in this report.

## **6.3 Waste Characterization Element Description**

EPA limited the scope of the T1 review to the following elements related to the use of AK for CH waste characterization:

- Waste identification and description, including radiological and physical characteristics and verification that the subject SCG S5000 waste is suitable for inclusion in supercompacted Waste Stream BN510.1.<sup>2</sup>
- Sufficiency of AK reports, including integration of source documents.
- Verification that the subject waste is of defense origin and is not high-level waste (HLW) or spent nuclear fuel (SNF).
- Load management.

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<sup>2</sup> AMWTP intends to incorporate the pre-1980 INL-exhumed SDA SCG S5000 waste into supercompacted debris Waste Stream BN510.1 [see Item (1)] for shipment to the WIPP facility.

## 6.4 Technical Evaluation

- (1) Information regarding the waste-generating processes and radiological and physical characteristics was evaluated to determine whether wastes were appropriately identified for future development of direct-ship waste streams and for inclusion of SCG S5000 waste in supercompacted Waste Stream BN510.1. Information evaluated was adequate for this purpose.

The pre-1980 INL-exhumed SDA waste was generated at several sites across the country and shipped to INL for disposal in the SDA, including in waste trenches and pits. Waste emplaced in Pits 1, 2, 11 and 12 and Trenches 1, 5, 7, 8, 9 and 10 include solid and debris waste. Soil waste was generated primarily through the removal of solid and debris waste, but AMWTP personnel stated that drums of soil from generator sites are also expected. AMWTP representatives stated that soil (SCG S4000) is not expected to be TRU waste, so EPA did not include SCG S4000 in this review.

The AKD, Revision 0, provided conflicting information about the percentage of waste in each SCG, but AMWTP representatives prepared a DCR to clarify that 60% of the waste is expected to be debris, 30% solids and the remaining 10% soils (References P847S, P1391A, P1392A and P1403S).

The AKD and references (e.g. References P443A, P647A, P758A and P847S) indicate that waste in the SDA as a whole is composed primarily of combustible and noncombustible debris, as well as a variety of materials including but not limited to metals, glass, decontamination material, electrical instruments, equipment, glovebox waste, graphite, filters and other debris. Waste may also include solids, such as RFP roaster oxide, soils and masonry, organic sludge (e.g., RFP Organic Setups [74A- and 743-series]) and reactor debris. Also, residues from recovery, sewage sludge, solidified and absorbed solutions and sources are expected (References P647A, P1403S and RPT-TRUW-91, Revision 1). AMWTP representatives stated that, although the AKD did not say so, AMWTP examined real-time radiography records for several IDR containers and determined that the physical composition of debris was consistent with the anticipated Waste Stream BN510.1 waste material parameter (WMP) ranges.

Detailed WMP percentages identifying the cellulose, plastic and rubber contents of waste containers are necessary to complete characterization. EPA, therefore, expects that future AKSRs for each direct shipped pre-1980 INL-exhumed SDA waste stream will include sufficiently detailed WMP percentages and distributions.

The original waste-generating processes are as varied as the sites generating the waste and include but are not limited to (References C842S, P443A, P647A, P758A, P847S, P1389A, P1390A, P1391A, P1392A and P1393A):

- Weapons production and support (e.g., RFP).
- Project Pluto (e.g., Coors Porcelain Company).
- Unspecified research (Colorado School of Mines).
- Non-DOE government operations.
- Uranium-233 recovery operations (Idaho Nuclear Technology and Engineering Center).

- Fuel examination and related activities (e.g., Naval Reactor Facility).
- INL research support (e.g., Test Area North).
- Decontamination and decommissioning (e.g., INL, sitewide).
- Test reactor support (Test Reactor Area, now the INL Reactor Technology Complex).
- Lawrence Berkeley Laboratory.
- U.S. Nuclear Regulatory Commission, San Francisco, originating from cleanup activities.

Waste placed in the SDA originated from several different processes, but the exhumation activities may commingle waste when containers are breached or compromised. Waste evaluation is ongoing, and AMWTP expects all debris to be transferred to Waste Stream BN510.1 and many of the SCG S3000 waste containers to be transferred to existing RFP S3000 waste streams. Consequently, process characteristics of pre-1980 INL-exhumed SDA direct-shipped waste cannot be ascertained at this time. EPA expects that future waste streams will be developed in accordance with the definition of “waste stream” presented in the WIPP waste analysis plan (WAP)<sup>3</sup> and waste acceptance criteria (WAC).<sup>4</sup>

AMWTP expects that, because waste from the EWR and IDR projects originated primarily from RFP, 95% of the activity will be from americium-241 (<sup>241</sup>Am), plutonium-239 (<sup>239</sup>Pu), <sup>240</sup>Pu and <sup>241</sup>Pu; the most prevalent radionuclides are expected to be <sup>241</sup>Pu and <sup>241</sup>Am. Because significant waste segregation is expected with respect to RFP solids and debris to be supercompacted, these estimates may not hold true when or if direct-shipped waste streams are identified. EPA expects that the radiological composition of direct-shipped waste streams will be evaluated in more detail when the waste streams are determined. The anticipated radiological composition of supercompacted waste fits within the radiological envelope identified in RPT-TRUW-83, Revision 3, “Acceptable Knowledge Summary for Supercompacted Debris Waste (BN510.1).”

AMWTP expects to supercompact all of the pre-1980 INL-exhumed SDA SCG S5000 waste and segregate most if not all of the SCG S3000 waste to existing RFP waste streams. If this is not possible, AMWTP may decide to direct ship pre-1980 INL-exhumed SDA SCG S3000 and SCG S5000 waste. EPA determined that AK information presented in reviewed documents is adequate to support the development of direct-shipped AKSRs and verified that the debris waste fit within the identified Waste Stream BN510.1 waste envelope. Notification to EPA upon completion of or revision to AKSRs and waste stream profile forms (WSPFs), including those for any direct-shipped waste streams, continues to be a T2 change (see Table 1). See Item (4) for additional requirements related to payload management of direct-shipped waste.

- (2) The acceptable knowledge reports and related documentation were assessed and found to be adequate.

AMWTP prepares multiple documents that together summarize the available information for pre-1980 INL-exhumed SDA CH TRU waste. AMWTP’s AK characterization process,

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<sup>3</sup> New Mexico Environment Department, “Waste Isolation Pilot Plant Hazardous Waste Facility Permit,” Waste Analysis Plan, Santa Fe, New Mexico, June 29, 2010.

<sup>4</sup> U.S. DOE CBFO, “Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant,” DOE/WIPP-02-3122, Revision 7.2, Carlsbad, New Mexico, June 13, 2011.

procedure MP-TRUW-8.13, Revision 24,<sup>5</sup> states that the process begins with development of generator-site-specific AK documents. In the case of this T1 request, AMWTP prepared one AKD: RPT-TRUW-91, Revision 0, "Acceptable Knowledge Document for Pre-1980 INL-Exhumed SDA Waste." The AK document is very general and includes data from the entire SDA, not just the area from which the pre-1980 INL-exhumed SDA waste was extracted. EPA identified several issues associated with the AK document. Specifically, EPA identified errors in the number of waste containers listed under each SCG, the trenches that contributed waste to the EWR project, the justification for waste comingling based on lack of container integrity (i.e., since the majority of containers extracted are apparently intact), and other typographical and text clarifications related to packaging and management of EWR- and IDR-project wastes. On May 21, 2013, AMWTP provided EPA with a DCR and draft Revision 1 of the AK document that addressed these issues. EPA expects a fully approved revision of RPT-TRUW-91 (Revision 1) to be included in the next quarterly T2 report (no later than the fiscal year 2013 fourth quarter report).

According to procedure MP-TRUW-8.13, information from the generator-site-specific AK document is then used to update other AMWTP summary reports. AMWTP provided the following reports to EPA as evidence of this process:

- RPT-TRUW-05, Revision 31, "Waste Matrix Code Reference Manual."
- RPT-TRUW-07, draft Revision 19a, "Determination of Radioisotopic Content in TRU Waste Based on Acceptable Knowledge."
- RPT-TRUW-12, draft Revision 20C, "AMWTP Waste Stream Designations."

These reports plus their supporting source documents contain the information required by the WIPP WAC and WIPP WAP. AMWTP revised each document in whole or in part to address the pre-1980 INL-exhumed SDA waste, as discussed below. The waste stream definition and documentation of physical and radiological components are discussed further in Item (1) above. The defense origin of the waste and the absence of SNF and HLW are discussed further in Item (3) below.

The waste matrix code reference manual, RPT-TRUW-05, contains detailed information, listed by generator site IDC and WMC, about the physical characteristics of all waste that is handled by AMWTP, including low-level waste. RPT-TRUW-05 includes information for all the IDCs identified in the pre-1980 INL-exhumed SDA AK document. RPT-TRUW-05 is also the primary source of information about the prohibited-item content of each IDC, because the AK document (RPT-TRUW-91, Revision 1) does not include this information. RPT-TRUW-05 appropriately distinguishes between the EWR and IDR projects' waste packaging configurations (References P652S, P653S, P654S, P655S, P664A and P753A). EPA reviewed RPT-TRUW-05, Revision 31, and found that the report does not yet include information about primary WMPs. This lack of information corresponds with a similar lack of detail in the AK document. RPT-TRUW-05 must be updated to present the physical characteristics of each IDC in the pre-1980 INL-exhumed

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<sup>5</sup> AMWTP, "Collection, Review, and Management of Acceptable Knowledge Documentation," MP-TRUW-8.13, Revision 24, Idaho Falls, Idaho, December 12, 2011.

SDA CH waste. Notification to EPA upon the availability of a revised RPT-TRUW-05 continues to be a T2 change (see Table 1).

RPT-TRUW-07 presents radiological information for EPA-approved waste sites, i.e. RFP, Mound Site, Battelle Columbus Laboratories, Bettis, the Hanford Site, and AMWTP supercompacted and newly generated (not supercompacted) wastes. RPT-TRUW-07, Revision 19a, includes Chapter 10 and Appendix H that address pre-1980 INL-exhumed SDA waste; AMWTP also revised parts of other sections and chapters to include pre-1980 INL-exhumed SDA waste. The pre-1980 INL-exhumed SDA radiological information presented in RPT-TRUW-07 is very general and reflects AMWTP's determination that the pre-1980 INL-exhumed SDA waste will be composed primarily of RFP waste. EPA pointed out that the report included typographical errors in the anticipated quantities of pre-1980 INL-exhumed SDA waste for each SCG. AMWTP did not provide a draft revision of RPT-TRUW-07 or a DCR to rectify SCG errors or clarify the anticipated radiological composition of the pre-1980 INL-exhumed SDA waste as a whole. EPA assumes that RPT-TRUW-07 will be further refined to better reflect the radiological and physical composition of the pre-1980 INL-exhumed SDA waste, particularly if pre-1980 INL-exhumed SDA wastes are singled out for direct shipment. Notification to EPA upon the availability of a revised RPT-TRUW-07 remains a T2 change (see Table 1). See Item (4) for additional information about payload management.

RPT-TRUW-12 is limited to descriptions of AMWTP-approved waste streams that originated at EPA-approved waste sites but are shipped to WIPP as AMWTP waste streams. RPT-TRUW-12 is typically used to identify the waste's hazardous constituents by IDC. AMWTP updated RPT-TRUW-12 (to draft Revision 20C) to include the chemical composition of pre-1980 INL-exhumed SDA waste as a whole for each SCG. The report also indicates that SDA waste can be subdivided into additional IDCs beyond those identified in the AK document (i.e., SDA wastes that are presumably not pre-1980 in origin are IDCs SD-704, -705 and -706). AMWTP representatives indicated that additional IDCs may be assigned to address, for example, polychlorinated biphenyl (PCB) versus non-PCB-bearing waste. RPT-TRUW-12, Revision 20C, adequately addresses SCG S5000 and SCG S3000 pre-1980 INL-exhumed SDA waste. Notification to EPA upon the availability of a revised RPT-TRUW-12 continues to be a T2 change (see Table 1).

Information about all AMWTP-generated waste, including supercompacted Waste Stream BN510.1, is presented in RPT-TRUW-06 (the AMWTP AK document). RPT-TRUW-83 (the Waste Stream BN510.1 AKSR) includes information about all feed material to the supercompacted waste stream. AMWTP did not provide updated versions of either RPT-TRUW-06 or RPT-TRUW-83 to EPA for review because edits to both documents were in progress at the time of this evaluation. EPA examined earlier versions of both documents (RPT-TRUW-06, Revision 14, and RPT-TRUW-83, Revision 3) to ensure that the proposed T1 pre-1980 INL-exhumed SDA waste fit within the Waste Stream BN510.1 envelope. Notification to EPA upon the availability of revised RPT-TRUW-06 and RPT-TRUW-83 remains a T2 change (see Table 1).

- (3) The generator-site-specific acceptable knowledge document was examined and indicates that data are available to determine that the wastes are defense in origin and are not high-level waste or spent nuclear fuel.

TRU waste to be emplaced in the WIPP must be defense in origin. DOE guidance defines waste as defense in origin if it was generated in whole or part by one of the atomic energy defense activities listed in section 10101(3) of the Nuclear Waste Policy Act of 1982 (NWPAA).<sup>6</sup> The WIPP Land Withdrawal Act (LWA), as amended,<sup>7</sup> prohibits the disposal of SNF and HLW as defined by the NWPAA at the WIPP.

The AK document indicates that waste from several non-defense waste generators has been disposed of at the SDA. This waste when exhumed should not be comingled with defense TRU CH debris as direct-shipped or supercompacted containers for disposal at the WIPP. EPA expects AMWTP to ensure that only defense debris waste will be included in direct-shipped waste streams in accordance with DOE guidance (Reference C329A). When this occurs the disposition of segregated non-defense waste should be properly recorded in the AK as IDC memoranda.

Similarly, while HLW and SNF are not expected, historical AK documentation does indicate that fuel may have been disposed of in the SDA pits and trenches. For example, Reference C842S states that Experimental Breeder Reactor-1 Mark III Fuel may be in Idaho Chemical Processing Plant waste in SDA Pit 12. However, the AK document indicates that SNF was not included in the IDR- or EWR-project wastes that had been shipped to AMWTP for packaging as a WIPP compliant waste. If AMWTP does identify SNF or HLW during future waste management operations of pre-1980 INL-exhumed SDA waste, AMWTP will segregate and handle the SNF or HLW waste on a case-by-case basis and must manage it separately from defense TRU CH waste destined for WIPP. In such an event, AMWTP will immediately notify EPA and provide EPA with information describing management of the identified SNF or HLW.

As a result of an EPA concern identified during the 2012–2013 AMWTP continued compliance inspection (EPA Docket No. A-98-49; II-A4-173), AMWTP will prepare IDC inclusion memoranda documenting the evaluations performed on each new IDC to be included in Waste Stream BN510.1. These memoranda will document that the IDCs meet the requirements of the LWA restrictions with respect to non-defense waste, SNF and HLW. Notification to EPA upon completion of or revision to IDC inclusion memoranda is a new T2 change (see Table 1).

- (4) Load management was found to be acceptable.

The WIPP WAC allows payload management in which a payload container may include drums that measure less than 100 nanocuries per gram (nCi/g) so long as the payload in total is greater than 100 nCi/g. The WAC defines a payload container as “the outermost container [(e.g., drum, Standard Large Box 2, standard waste box, 10-drum overpack, canister)] for TRU waste material that is placed in a reusable Type B shipping container (e.g., TRUPACT-II, TRUPACT-III,

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<sup>6</sup> U.S. Code, Title 42, “The Public Health and Welfare,” Chapter 108, “Nuclear Waste Policy Act of 1982.”

<sup>7</sup> Public Law 102-579, The Waste Isolation Pilot Plant Land Withdrawal Act, October 30, 1992, as amended by Public Law 104-201, September 23, 1996.

HalfPACT, RH-TRU 72-B, or 10-160B) for transport.” The AKSR for each waste stream selected for payload management must include an estimate of the total waste volume and percentage of the waste volume that is above and below 100 nCi/g. Each drum selected for payload management must also contain at least one TRU isotope whose activity exceeds the lower limit of detection of the radioassay system used to characterize the waste, and each drum may only be overpacked into a payload container with other containers from the same TRU waste stream.

AMWTP includes WAC payload documentation in RPT-TRUW-07 instead of in individual AKSRs. Supercompacted waste is payload managed because the 100-gallon drum in which supercompacted silver drums are placed is considered to be the payload container. Pre-1980 INL-exhumed SDA waste that is direct shipped from AMWTP may also be payload managed so long as the appropriate WAC requirements are met. AMWTP updated RPT-TRUW-07 (to Revision 19a) to include pre-1980 INL-exhumed SDA waste, but AMWTP needs to make additional changes to the estimated quantities for each SCG to incorporate the changes presented in RPT-TRUW-91, draft Revision 1. Notification to EPA upon availability of a revised RPT-TRUW-07 incorporating modifications to the quantities of pre-1980 INL-exhumed SDA waste remains a T2 change.

## **7.0 FINDINGS AND CONCERNS**

The EPA inspection team did not identify any findings or concerns during this T1 evaluation. There are no open issues related to this T1 evaluation.

## **8.0 CONCLUSIONS**

### **Changes to Tiering**

Notification to EPA upon revision to AMWTP reports RPT-TRUW-05, RPT-TRUW-06, RPT-TRUW-07, RPT-TRUW-12 and RPT-TRUW-83 remains a T2 change. Table 1 was modified to update the list of approved waste sources to include pre-1980 INL-exhumed SDA waste, to explicitly list modifications to RPT-TRUW-06 and RPT-TRUW-83 as examples of T2 changes. Notification of any IDC inclusion memoranda associated with changes to RPT-TRUW-83 is a new T2 change. EPA also revised the tiering table to ensure completeness and consistency with recent EPA T1 approval reports. Table 1 shows the substantive T1 and T2 changes in bold text. T1 and T2 changes that were initiated during the baseline approval remain in effect; these are listed as applicable in section 6.0. The language in Table 1 regarding AK documentation applies to all AMWTP waste streams, including load-managed and direct-shipped waste streams.

### **Approval**

This T1 change consisted of the use of AK to characterize pre-1980 INL-exhumed SDA SCG S3000 and SCG S5000 waste. With this approval of the AK aspect of the characterization process, AMWTP may characterize physical and radiological contents of these two waste types using the equipment, processes and procedures that EPA approved during the October 2006 baseline approval (see EPA Docket No A-98-49: II-A4-66, October 3, 2006). As stated above, EPA requires submission of NDA and NDE BDRs for the subject wastes along with the applicable quarterly T2 submissions. This is different from EPA’s requirement that the NDA and

NDE BDRs for ANLE and MFC wastes be provided prior to the first shipments of these wastes (see EPA Docket No. A-98-49; II-A4-169, January 29, 2013). This is due to EPA's determination, based on reviews conducted during EPA's Continued Compliance Inspection of February 2013 and review of the ANLE and MFC BDRs received in February 2013, that AMWTP can adequately prepare BN-510 BDRs recording the radiological and physical contents of waste containers managed by the site. EPA also requires that if SNF or HLW is identified during characterization of the pre-1980 INL-exhumed SDA waste, AMWTP will immediately notify EPA and provide EPA with information describing management of the identified SNF or HLW.

## ATTACHMENT A

### APPROVAL SUMMARY FOR ADVANCED MIXED WASTE TREATMENT PROJECT CONTACT-HANDLED WASTE CHARACTERIZATION PROGRAM

Approved Activity	EPA Inspection Number, Approval Dates	EPA Docket Number
AMWTP CH Baseline Approval	EPA-AMWTP-03.06-8 October 2006	A-98-49; II-A4-66
T1 Change – Addition of Four Hanford Legacy Debris Waste Streams to the BN510 Super-Compacted Debris Waste Stream	June 2010	A-98-49; II-A4-127
Unannounced Continued Compliance Inspection	March 2011	A-98-49; II-A4-143
T1 Change – Addition of ANLE-generated SCG S3000 and S5000 CH Waste and MFC-generated SCG S5000 CH Waste	January 2013	A-98-49; II-A4-169
Continued Compliance Inspection	April 2013	A-98-49; II-A4-173

## ATTACHMENT B

### LIST OF DOCUMENTS CITED BY EPA DURING THE T1 EVALUATION

- C329A, Correspondence from Frank Marcinowski to EM-13 (Stan Wolf, 301-903-7962), Process for TRU Waste Defense Determination, February 2005
- C842S, Email correspondence, between Tim Venneman (AMWTP) and Kirk Green (ICP), Pits 11 and 12 disposals, October 20, 2009
- C1069A, Estimated Waste Stream Volumes for Pre-1980 INL-Exhumed SDA wastes, TV-TV-002-12
- P443A, Historical Background Report for Rocky Flats Plant Waste Shipped to the INEEL and Buried in the SDA from 1954 to 1971, North Wind, Inc. TRU Program Technical Services, ICP/EXT-04-00248, Revision 1, March 2005
- P647A, Central Characterization Project Acceptable Knowledge Summary Report for Waste Retrieved from Designated Areas within the Subsurface Disposal Area at the Idaho National Laboratory, CCP-AK-INL-001, ICP/EXT-06-01203, Revision 2
- P652S, Initial Drum Retrieval Final Report, EG&G Idaho, Kirk B. McKinley and Joseph D. McKinney, TREE-1286, August 1978
- P653S, Initial Drum Retrieval Interim Report, EG&G Idaho, D.H. Card and D.K. Wang, TREE-1079, May 1977
- P654S, Early Waste Retrieval Final Report, EG&G Idaho, James R. Bishoff and Robert J. Hudson, TREE-1321, August 1979
- P655S, Containment of Transuranic Contamination at the Early Waste Retrieval Project, Joseph L. Harness and Joseph D. McKinney, TREE-1061, January 1977
- P664A, Early Waste Retrieval Interim Report, EG&G Idaho, D.H. Card, Manager, Retrieval Operations, TREE-1047, February 1977
- P753A, Early Waste Retrieval Interim Report, EG&G Idaho, Kirk B. McKinley and Joseph D. McKinney, TREE-1265, May 1978
- P758A, Solid Radioactive Waste Retrieval Test, R.J. Thompson, Allied Chemical Corporation, Idaho Chemical Programs, Operations Office, National Reactor Testing Station, ACI-120, May 1972
- P847S, Subsurface Disposal Area (SDA) Waste Identification (1952–1970 Emphasis), M.J. Vigil, INEL Environmental Restoration Program, EGG-WM-8727, Revision 2, January 24, 1990

P1389A, A Comprehensive Inventory of Radiological and Nonradiological Contaminants in Waste Buried in the Subsurface Disposal Area of the INEL RWMC During the Years 1952–1983, Volume 1, INEL-95/0310 (Formerly EGG-WM-10903), Revision 1, August 1995

P1390A, A Comprehensive Inventory of Radiological and Nonradiological Contaminants in Waste Buried in the Subsurface Disposal Area of the INEL RWMC During the Years 1952–1983, Volume 2, INEL-95/0310 (Formerly EGG-WM-10903), Revision 1, August 1995

P1391A, A Comprehensive Inventory of Radiological and Nonradiological Contaminants in Waste Buried in the Subsurface Disposal Area of the INEL RWMC During the Years 1952–1983, Volume 3, INEL-95/0310 (Formerly EGG-WM-10903), Revision 1, August 1995

P1392A, A Comprehensive Inventory of Radiological and Nonradiological Contaminants in Waste Buried in the Subsurface Disposal Area of the INEL RWMC During the Years 1952–1983, Volume 4, INEL-95/0310 (Formerly EGG-WM-10903), Revision 1, August 1995

P1393A, A Comprehensive Inventory of Radiological and Nonradiological Contaminants in Waste Buried in the Subsurface Disposal Area of the INEL RWMC During the Years 1952–1983, Volume 5, INEL-95/0310 (Formerly EGG-WM-10903), Revision 1, August 1995

P1403S, A Brief Analysis and Description of Transuranic Wastes in the Subsurface Disposal Area of the Radioactive Waste Management Complex at INEL, D.A. Arrenholz and J.L. Knight, EGG-WTD-9438, Revision 1, November 22, 1991

P1404A, Management of Transuranic Contaminated Material, U.S. Department of Energy, DOE O 5820.1, 1982

P1411S, Overview of an Integrated Comprehensive Environmental Response, Compensation and Liability Act Evaluation of the Subsurface Disposal Area at the Idaho National Engineering and Environmental Laboratory, K.J. Holdren, August 4, 2002

P1412S, Radioactive Waste Management Complex Investigation Report, Volumes 1 through 4, M.L. Paarmann, EGG-WM-9707, December 1991

Document Change Request for RPT-TRUW-91, Revision 0, Advanced Mixed Waste Treatment Project, DCR-12333, provided to EPA May 21, 2013

RPT-TRUW-05, Waste Matrix Code Reference Manual, Advanced Mixed Waste Treatment Project, Revision 31, January 31, 2013

RPT-TRUW-06, Acceptable Knowledge Baseline Document for AMWTP Waste, Revision 14, July 5, 2012

RPT-TRUW-07, Determination of Radioisotopic Content in TRU Waste Based on Acceptable Knowledge, Advanced Mixed Waste Treatment Project, Revision 18, March 19, 2013, Revision 19a, draft provided to EPA May 1, 2013

RPT-TRUW-12, AMWTP Waste Stream Designations, Advanced Mixed Waste Treatment Project, Revision 19, November 13, 2012, Revision 20C, draft provided to EPA May 1, 2013

RPT-TRUW-83, Acceptable Knowledge Summary for Supercompacted Debris Waste (BN510.1), Advanced Mixed Waste Treatment Project, Revision 3, September 17, 2012

RPT-TRUW-91, Acceptable Knowledge Document for Pre-1980 INL-Exhumed SDA Waste, Revision 0, February 14, 2013, Revision 1, draft provided to EPA May 21, 2013