

ATTACHMENT B7

PERMITTEE LEVEL TRU WASTE CONFIRMATION PROCESSES

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ATTACHMENT B7

PERMITTEE LEVEL TRU WASTE CONFIRMATION PROCESSES

1 Introduction

2 This part of the Waste Analysis Plan (**WAP**) describes the actions that the Permittees will take
3 to approve and accept waste for storage and disposal at the Waste Isolation Pilot Plant (**WIPP**),
4 including waste confirmation activities.

5 The Permittees demonstrate compliance with the Permit by ensuring that the waste
6 characterization processes performed by generator/storage sites (**sites**) produce data compliant
7 with the WAP and through the waste screening and verification processes. Verification occurs at
8 three levels: 1) the data generation level, 2) the project level, and 3) the Permittee level. The
9 Permittees also examine a representative subpopulation of waste prior to shipment to confirm
10 that the waste contains no ignitable, corrosive or reactive waste; and that assigned
11 Environmental Protection Agency (**EPA**) hazardous waste numbers are allowed by the Permit.
12 The waste confirmation activities described herein occur prior to shipment of the waste from the
13 generator/storage site to WIPP.

14 B7-1 Permittee Confirmation of TRU Mixed Waste

15 Waste confirmation is defined in Module I as the activities performed by the Permittees to satisfy
16 the requirements specified in Section 310 of Pub. L. 108-447. Waste confirmation occurs after
17 waste containers have been certified for disposal at WIPP. The general confirmation process for
18 WIPP waste is presented in Figure B7-1.

19 B7-1a Permittees' Confirmation of a Representative Subpopulation of the Waste

20 The Permittees shall confirm that the waste contains no ignitable, corrosive, or reactive waste
21 through radiography (Section B7-1b) or the use of visual examination (Section B7-1c) of a
22 statistically representative subpopulation of the waste. Prior to shipment to WIPP, waste
23 confirmation will be performed on randomly selected containers from each CH and RH TRU
24 mixed waste stream shipment. Figure B7-1 presents the overall waste verification and
25 confirmation process.

26 The Permittees' waste confirmation encompasses ensuring that the physical characteristics of
27 the TRU mixed waste correspond with its waste stream description and that the waste does not
28 contain liquids in excess of TSDF-WAC limits or compressed gases. These techniques can
29 detect liquids that exceed 1 percent volume of the container and containerized gases, which are
30 prohibited from storage or disposal at the WIPP facility. The prohibition of liquids and
31 containerized gases prevents the storage or disposal of ignitable, corrosive, or reactive wastes.
32 Radiography and/or visual examination will ensure that the physical form of the waste matches
33 its waste stream description (i.e., Homogeneous Solids, Soil/Gravel, or Debris Waste). The
34 results of the Permittees' waste confirmation activities, including radiography and visual
35 examination records (data sheets, packaging logs, and/or video and audio recordings) will be

1 maintained in the WIPP facility operating record. Noncompliant waste identified during waste
2 confirmation will be managed as described in Section B7-2.

3 The Permittees shall randomly select at least 7 percent of each waste stream shipment for
4 waste confirmation. This equates to a minimum of one container from each fourteen containers
5 in each waste stream in each designated shipment. If there are less than fourteen containers
6 from a waste stream in a particular shipment, a minimum of one container from the waste
7 stream shipped will be selected. If the random selection of containers in a shipment occurs prior
8 to loading the waste containers into the Shipping Package, the randomly selected containers
9 may be consolidated into a single Type B package consistent with transportation requirements.
10 Documentation of the random selection of containers for waste confirmation will be placed in the
11 WIPP facility operating record.

12 B7-1a(1) Confirmation Training Requirements

13 Waste confirmation may be completed by performing actual radiography/visual examination on
14 the waste container(s) or by a review of radiography/visual examination media and records.

15 Waste confirmation personnel may be trained to either review of radiography/visual examination
16 media and records (Level 1) or to perform actual radiography/visual examination on the waste
17 container(s) (Level 2). Level 2 personnel may also perform waste confirmation by review of
18 media and records.

19 The Permittees management representative must be trained to the requirements of Level 2.

20 B7-1b Radiography Methods Requirements

21 Radiography has been developed by the Permittees specifically to aid in the examination and
22 identification of containerized waste. The Permittees shall describe all activities required to
23 achieve the radiography objectives in standard operating procedures (**SOPs**). These SOPs shall
24 include instructions specific to the radiography system(s) used by the Permittees at an off-site
25 facility (e.g., the generator/storage site). For example, to detect liquids, some systems require
26 the container to be rotated back and forth while other systems require the container to be tilted.

27 A radiography system (e.g., real time radiography, digital radiography/computed tomography)
28 normally consists of an X-ray-producing device, an imaging system, an enclosure for radiation
29 protection, a waste container handling system, a video and audio recording system, and an
30 operator control and data acquisition station. Although these six components are required, it is
31 expected there will be some variation within a given component between radiography systems.
32 The radiography system shall have controls or an equivalent process which allow the operator
33 to control image quality. On some radiography systems, it should be possible to vary the
34 voltage, typically between 150 to 400 kilovolts (**kV**), to provide an optimum degree of
35 penetration through the waste. For example, high-density material should be examined with the
36 X-ray device set on the maximum voltage. This ensures maximum penetration through the
37 waste container. Low-density material should be examined at lower voltage settings to improve
38 contrast and image definition. The imaging system typically utilizes either a fluorescent screen
39 and a low-light television camera or x-ray detectors to generate the image.

1 To perform radiography, the waste container is scanned while the operator views the television
2 screen. A video and audio recording is made of the waste container scan and is maintained in
3 the WIPP facility operating record as a non-permanent record. A radiography data form is also
4 used to document the Waste Matrix Code, ensure that the waste container contains no
5 ignitable, corrosive, or reactive waste by documenting the absence of liquids in excess of TSDF-
6 WAC limits or compressed gases, and verify that the physical form of the waste is consistent
7 with the waste stream description documented on the WSPF. Containers whose contents
8 prevent full examination of the remaining contents shall be subject to visual examination unless
9 the Permittees certify that visual examination would provide no additional relevant information
10 for that container based on the acceptable knowledge information for the waste stream. Such
11 certification shall be documented in the WIPP facility operating record.

12 For containers that have been characterized using radiography by the generator/storage sites in
13 accordance with the method in Attachment B1, Section B1-3, the Permittees may perform
14 confirmation by review of the generator/storage site's radiography audio/video recordings.

15 For containers which contain classified shapes and undergo radiography, the radiography will
16 occur at a facility with appropriate security provisions and the video and audio recording will be
17 considered classified. The radiography data forms will not be considered classified.

18 B7-1b(1) Radiography Training

19 The radiography system involves qualitative and semiquantitative evaluations of visual displays.
20 Operator training and experience are the most important considerations for ensuring quality
21 controls in regard to the operation of the radiography system and for interpretation and
22 disposition of radiography results. Only trained personnel shall be allowed to operate
23 radiography equipment.

24 The Permittee radiography operators performing waste confirmation shall be trained in
25 accordance with the requirements of Permit Attachment H1.

26 B7-1b(2) Radiography Oversight

27 The Permittees shall be responsible for monitoring the quality of the radiography data and
28 calling for corrective action, when necessary.

29 A training drum with internal containers of various sizes shall be scanned biennially by each
30 Level 2 operator. The video and audio media shall then be reviewed by a radiography subject
31 matter expert to ensure that operators' interpretations remain consistent and accurate. Imaging
32 system characteristics shall be verified on a routine basis.

33 Independent replicate scans and replicate observations of the video output of the radiography
34 process shall be performed under uniform conditions and procedures. Independent replicate
35 scans shall be performed on one waste container per day or once per shipment, whichever is
36 less frequent. Independent observations of one scan (not the replicate scan) shall also be made
37 once per day or once per shipment, whichever is less frequent, by a qualified radiography
38 operator other than the individual who performed the first examination. When confirmation is

1 performed by review of audio/video recorded scans produced by the generator/storage site as
2 specified in Permit Attachment B1, Section B1-3, independent observations shall be performed
3 on two waste containers per shipment or two containers per day, whichever is less frequent.

4 B7-1c Visual Examination Methods Requirements

5 Visual examination (**VE**) may also be used as a waste confirmation method by the Permittees.
6 VE shall be conducted by the Permittees in accordance with written SOPs to describe the
7 contents of a waste container. The description shall clearly identify all discernible waste items,
8 residual materials, packaging materials, or waste material parameters. VE may be used by the
9 Permittees to examine a statistically representative subpopulation of the waste certified for
10 shipment to WIPP to confirm that the waste contains no ignitable, corrosive, or reactive waste.
11 This is achieved by confirming that the waste contains no residual liquids in excess of TSDF-
12 WAC limits or compressed gases, and that the physical form of the waste matches the waste
13 stream description documented on the WSPF. A VE data form is used to document this
14 information. During packaging, the waste container contents are directly examined by trained
15 personnel. This form of waste confirmation may be performed by the Permittees at a
16 generator/storage site. The VE may be recorded on video and audio media, or alternatively, by
17 using a second operator to provide additional verification by reviewing the contents of the waste
18 container to ensure correct reporting.

19 In order to keep radiation doses as low as reasonably achievable at generator/storage sites, the
20 Permittees may use their own trained VE operators to perform VE for waste confirmation by
21 reviewing video media prepared by the generator/storage site during their VE of the waste. If the
22 Permittees perform waste confirmation by review of video media, the video record of the VE
23 must be sufficiently complete for the Permittees to confirm the Waste Matrix Code and waste
24 stream description, and verify the waste contains no residual liquids in excess of TSDF-WAC
25 limits or compressed gases. Generator/storage site VE video/audio media subject to review by
26 the Permittees shall meet the following minimum requirements:

- 27 • The video/audio media shall record the waste packaging event for the container
28 such that all waste items placed into the container are recorded in sufficient
29 detail that a trained Permittee VE expert can determine what the waste items are
30 and their associated waste material parameter.
- 31 • The video/audio media shall capture the waste container identification number.
- 32 • The personnel loading the waste container shall be identified on the video/audio
33 media or on packaging records traceable to the loading of the waste container.
- 34 • The date of loading of the waste container will be recorded on the video/audio
35 media or on packaging records traceable to the loading of the waste container.

36 The Permittees may also use their own trained VE operators to perform VE for waste
37 confirmation by reviewing VE data forms or packaging logs prepared by the generator during
38 their packaging of the waste. To be acceptable, the generator/storage site VE data must be
39 signed by two generator/storage site personnel who witnessed the packaging of the waste and
40 must provide sufficient information for the Permittees to determine that the waste container

1 contents match the waste stream description on the WSPF and the waste contains no liquids in
2 excess of TSDF-WAC limits or compressed gases. The Permittees will document their review of
3 generator/storage site VE data on Permittee VE data forms. Generator/storage site VE forms or
4 packaging logs subject to review by the Permittees shall meet the following minimum
5 requirements:

- 6 • At least two generator site personnel shall approve the data forms or packaging
7 logs attesting to the contents of the waste container.
- 8 • The data forms or packaging logs shall contain an inventory of waste items in
9 sufficient detail that a trained Permittee VE expert can identify the associated
10 waste material parameters.
- 11 • The waste container identification number shall be recorded on the data forms or
12 packaging logs.

13 VE video media of containers which contain classified shapes shall be considered classified
14 information. VE data forms will not be considered classified information.

15 B7-1c(1) Visual Examination Training

16 The Permittees' VE operators performing waste confirmation shall be trained in accordance with
17 the requirements of Permit Attachment H1.

18 B7-1c(2) Visual Examination Oversight

19 The Permittees shall designate at least one VE expert. The VE expert shall be familiar with the
20 processes that were used to generate the waste streams being confirmed using VE. The VE
21 expert shall be responsible for the overall direction and implementation of the Permittees' VE
22 program. The Permittees shall specify the selection, qualification, and training requirements of
23 the visual examination expert in an SOP.

24 B7-1d Quality Assurance Objectives (QAOs) for Radiography and Visual Examination

25 The QAOs the Permittees must meet for radiography and visual examination are detailed in this
26 section. If the QAOs described below are not met, then corrective action as specified in Permit
27 Attachment B3, Section B3-13 shall be taken.

28 B7-1d(1) Radiography QAOs

29 The QAOs for radiography are detailed in this section. If the QAOs described below are not met,
30 then corrective action shall be taken.

31 Data to meet these objectives must be obtained from a video and audio recorded scan provided
32 by trained radiography operators. Results must also be recorded on a radiography data form.
33 The precision, accuracy, representativeness, completeness, and comparability objectives for
34 radiography data are presented below.

1 Precision

2 Precision is maintained by reconciling any discrepancies between two radiography operators
3 with regard to the waste stream waste confirmation, identification of liquids in excess of TSDF-
4 WAC limits, and identification of compressed gases through independent replicate scans and
5 independent observations.

6 Accuracy

7 Accuracy is obtained by using a target to tune the image for maximum sharpness and by
8 requiring operators to successfully identify 100 percent of the required items in a training
9 container during their initial qualification and subsequent requalification.

10 Representativeness

11 Representativeness is ensured by performing radiography on a random sample of waste
12 containers from each waste stream in each shipment.

13 Completeness

14 A video and audio media recording of the radiography examination and a validated radiography
15 data form will be obtained for 100 percent of the waste containers subject to radiography.

16 Comparability

17 The comparability of radiography data from different operators shall be enhanced by using
18 standardized radiography procedures and operator qualifications.

19 B7-1d(2) Visual Examination QAOs

20 Results must be recorded on a VE data form. The precision, accuracy, representativeness,
21 completeness, and comparability objectives for VE data are presented below.

22 Precision

23 Precision is maintained by reconciling any discrepancies between the operator and the
24 independent technical reviewer with regard to the waste stream waste confirmation,
25 identification of liquids in excess of TSDF-WAC limits, and identification of compressed gases.

26 Accuracy

27 Accuracy is maintained by requiring operators to pass a comprehensive examination and
28 demonstrate satisfactory performance in the presence of the VE expert during their initial
29 qualification and subsequent requalification.

1 Representativeness

2 Representativeness is ensured by performing VE on a random sample of waste containers
3 within each waste stream in each shipment.

4 Completeness

5 A validated VE data form will be obtained for 100 percent of the waste containers subject to VE.

6 Comparability

7 The comparability of VE data from different operators shall be enhanced by using standardized
8 VE procedures and operator qualifications.

9 B7-1e Review and Validation of Radiography and Visual Examination Data Used for Waste
10 Examination

11 This section describes the requirements for review and validation of radiography and VE data by
12 the Permittees.

13 B7-1e(1) Independent Technical Review

14 The radiography and/or VE confirmation data for each shipment shall receive an independent
15 technical review. This review will be performed before the affected waste shipment is shipped to
16 the WIPP facility. The review shall be performed by an individual other than the data generator
17 who is qualified to have performed the work. The review will be performed in accordance with
18 approved Permittee SOPs and will be documented on a review checklist. The reviewer(s) must
19 approve the data as evidenced by signature, and as a consequence, ensure the following:

- 20 ● Data generation and reduction were conducted in a technically correct manner in
21 accordance with the methods used (procedure with revision). Data were reported
22 in the proper units and correct number of significant figures.
- 23 ● The data have been reviewed for transcription errors.
- 24 ● Radiography video and audio media recordings have been reviewed
25 (independent observation) on a waste container basis at a minimum of once per
26 shipment or once per day of operation, whichever is less frequent. The
27 radiography video/audio recording will be reviewed against the data reported on
28 the Permittees' radiography form to ensure that the data are correct and
29 complete. If review of radiography scans recorded by the generator/storage site
30 was used to perform confirmation, two observations must be performed for each
31 shipment or two observations per day, whichever is less frequent.

1 B7-1e(2) Permittee Management Review

2 The radiography and/or visual examination data for each shipment shall receive a Permittee
3 management review. This review will be performed before the affected waste shipment is
4 disposed of at the WIPP. The review shall be performed by a designated member of Permittee
5 management. The review will be performed in accordance with approved Permittee SOPs and
6 will be documented on a review checklist. The reviewer(s) must approve the data as evidenced
7 by signature, and as a consequence, ensure the following:

- 8 ● The data are technically reasonable based on the technique used.
- 9 ● The data have received independent technical review.
- 10 ● The data indicate that the waste examined contained no ignitable, corrosive, or
11 reactive waste and that the physical form of the waste was consistent with the
12 waste stream description in the WSPF.
- 13 ● QC checks have been performed (e.g., replicate scans, image quality checks).
- 14 ● The data meet the established QAOs

15 Upon completion of the Permittee management review, the waste confirmation data for the
16 shipment shall be submitted to the WIPP facility operating record as non-permanent records.
17 Waste confirmation data includes radiography and VE data forms, video/audio media, and
18 review checklists.

19 B7-2 Noncompliant Waste Identified During Waste Confirmation

20 If the Permittees identify noncompliant waste during waste confirmation at a generator/storage
21 site (i.e., the waste does not match the waste stream description documented in the WSPF or
22 there are liquids in excess of TSDF-WAC limits or compressed gases) the waste will not be
23 shipped. The Permittees will suspend further shipments of the affected waste stream and issue
24 a CAR to the generator/storage site. Shipments of affected waste streams shall not resume until
25 the CAR has been closed. NMED will be notified within 24 hours of any suspension of waste
26 stream shipments due to the identification of noncompliant waste during waste confirmation.

27 As part of the corrective action plan in response to the CAR, the generator/storage site will
28 evaluate whether the waste characterization information documented in the Characterization
29 Information Summary and/or WSPF for the waste stream must be updated because the results
30 of waste confirmation for the waste stream indicated that the TRU mixed waste being examined
31 did not match the waste stream description. The generator/storage site will thoroughly evaluate
32 the potential impacts on waste that has been shipped to WIPP. The Permittees will evaluate the
33 potential that prohibited items were shipped to WIPP and what remedial actions should occur, if
34 any. The results of these evaluations will be provided to NMED before shipments of affected
35 waste streams resume. If the Characterization Information Summary and/or WSPF requires
36 revision, shipments of the affected waste stream shall not resume until the revised waste stream
37 waste characterization information has been reviewed and approved by the Permittees.

1 If a generator/storage site certifies noncompliant waste more than once during a running 90-day
2 period, the Permittees will suspend acceptance of that site's waste until the Permittees find that
3 all corrective actions have been implemented and the site complies with all applicable
4 requirements of the WAP.

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1

FIGURES

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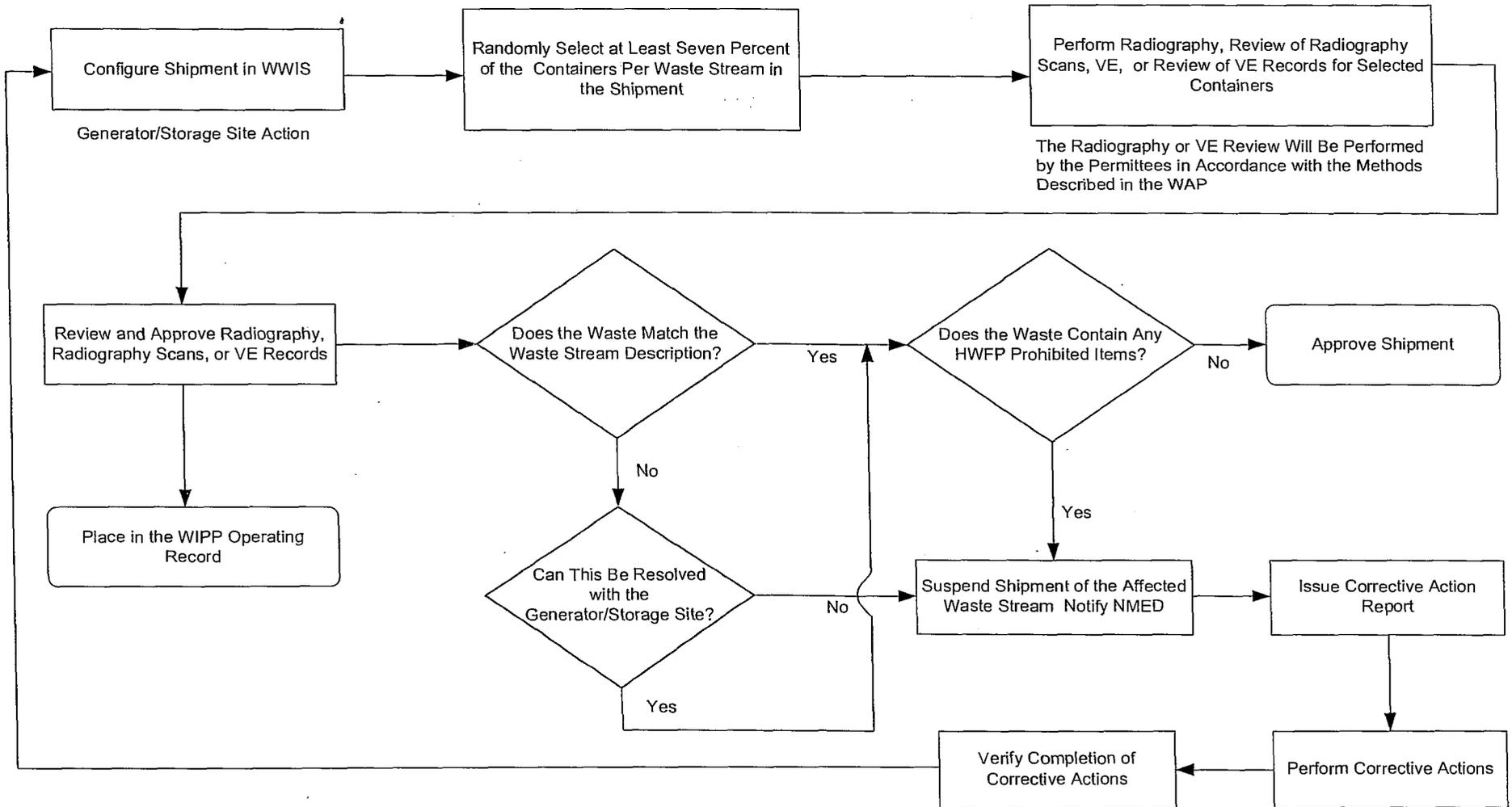


Figure B7-1
 Overview of Waste Confirmation