

ATTACHMENT ~~B~~ C
WASTE ANALYSIS PLAN

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WASTE ANALYSIS PLAN
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WASTE ANALYSIS PLAN

BC-0 Introduction and Attachment Highlights

This waste analysis plan (**WAP**) has been prepared for management, storage, or disposal activities to be conducted at the Waste Isolation Pilot Plant (**WIPP**) facility to meet requirements set forth in 20.4.1.500 NMAC (incorporating 40 CFR §264.13). Guidance in the most recent U.S. Environmental Protection Agency (**EPA**) manual on waste analysis has been incorporated into the preparation of this WAP (EPA, 1994). This WAP includes test methods, details of planned waste sampling and analysis for complying with the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.13), a description of the waste shipment screening and verification process, and a description of the quality assurance (**QA**)/quality control (**QC**) program. Before the Permittees manage, store, or dispose transuranic (**TRU**) mixed waste from a generator/storage site (**site**), the ~~Permittees~~ Department of Energy Carlsbad Field Office (**DOE**) shall require that site to implement the applicable requirements of this WAP.

TRU mixed waste that may be stored or disposed at WIPP are or were generated at DOE generator/storage sites by various specific processes and activities. Examples of the major types of operations that generate this waste include:

- Production of Nuclear Products—Production of nuclear products includes reactor operation, radionuclide separation/finishing, and weapons fabrication and manufacturing. The majority of the TRU mixed waste was generated by weapons fabrication and radionuclide separation/finishing processes. More specifically, wastes consist of residues from chemical processes, air and liquid filtration, casting, machining, cleaning, product quality sampling, analytical activities, and maintenance and refurbishment of equipment and facilities.
- Plutonium Recovery—Plutonium recovery wastes are residues from the recovery of plutonium-contaminated molds, metals, glass, plastics, rags, salts used in electrorefining, precipitates, firebrick, soot, and filters.
- Research and Development (**R&D**)—R&D projects include a variety of hot cell or glovebox activities that often simulate full-scale operations described above, producing similar TRU mixed wastes. Other types of R&D projects include metallurgical research, actinide separations, process demonstrations, and chemical and physical properties determinations.
- Decontamination and Decommissioning—Facilities and equipment that are no longer needed or usable are decontaminated and decommissioned, resulting in TRU mixed wastes consisting of scrap materials, cleaning agents, tools, piping, filters, Plexiglas™, gloveboxes, concrete rubble, asphalt, cinder blocks, and other building materials. These materials are expected to be the largest category by volume of TRU mixed waste to be generated in the future.

1 TRU mixed waste contains both TRU radioactive and hazardous components, as defined in
2 20.4.1.800 NMAC (incorporating 40 CFR, §268.35(d)), and in the Federal Facility Compliance
3 Act, Public Law 102- 386, Title 1, §3021(d). It is designated and separately packaged as either
4 contact-handled (**CH**) or remote-handled (**RH**), based on the radiological dose rate at the
5 surface of the waste container.

6 The hazardous components of the TRU mixed waste to be managed at the WIPP facility are
7 designated in Table **B.C-9**. Some of the waste may also be identified by unique state hazardous
8 waste codes or numbers. These wastes are acceptable at WIPP as long as the Treatment,
9 Storage, and Disposal Facility Waste Acceptance Criteria (**TSDF-WAC**) in Module II are met.
10 This WAP describes the measures that will be taken to ensure that the TRU mixed wastes
11 received at the WIPP facility are within the scope of Table **B.C-9** as established by 20.4.1.500
12 NMAC (incorporating 40 CFR §264), and that they comply with unit-specific requirements of
13 20.4.1.500 NMAC (incorporating 40 CFR §264.600), Miscellaneous Units.

14 Some TRU mixed waste is retrievably stored at the DOE generator/storage sites. Additional
15 TRU mixed waste will be generated and packaged into containers at these generator/storage
16 sites in the future. TRU mixed waste will be retrieved from storage areas at a DOE
17 generator/storage site. Retrievably stored waste is defined as TRU mixed waste generated after
18 1970 and before the New Mexico Environment Department (**NMED**) notifies ~~the Permittees~~
19 DOE, by approval of the final audit report, that the characterization requirements of the WAP at
20 a generator/storage site have been implemented. Newly generated waste is defined as TRU
21 mixed waste generated after NMED approves the final audit report for a generator/storage site.
22 Acceptable knowledge (**AK**) information is assembled for both retrievably stored and newly
23 generated waste. Waste characterization of retrievably stored TRU mixed waste will be
24 performed on an ongoing basis, as the waste is retrieved. Waste characterization of newly
25 generated TRU mixed waste is typically performed as it is generated, although some
26 characterization occurs post-generation. Waste characterization requirements for newly
27 generated and retrievably stored TRU mixed wastes differ, as discussed in Sections **B.C-3d(1)**
28 and **B.C-3d(2)**.

29 Waste characterization is defined in Module I as the activities performed by the waste generator
30 to satisfy the general waste analysis requirements of 20.4.1.500 NMAC (incorporating 40 CFR
31 §264.13(a)) before waste containers have been certified for disposal at WIPP. The
32 characterization process for WIPP waste is presented in Figure **B.C-2**. Generator site waste
33 characterization programs are first audited by ~~the Permittees~~ DOE, with NMED approving the
34 final audit report. After this, generator sites determine whether AK alone is sufficient for
35 characterization, or whether a sampling and analysis program in conjunction with AK is
36 necessary to adequately characterize wastes. If an AK Sufficiency Determination is sought,
37 information is provided to ~~the Permittees~~ DOE for their review and provisional approval; NMED
38 determination of adequacy of the AK information is required before final approval by ~~the~~
39 Permittees DOE. If the sampling and analysis route is chosen, sites proceed to sample and
40 analyze waste in conjunction with AK and in accordance with this WAP. Once an AK Sufficiency
41 Determination is obtained, or when required sampling and analysis data are obtained, sites
42 would then prepare and submit the Waste Stream Profile Form for ~~the Permittees'~~ DOE's
43 approval. Once the WSPF is approved, a site may ship waste to WIPP. ~~The Permittees~~ DOE
44 will perform waste confirmation prior to shipment of the waste from the generator/storage site to
45 WIPP as specified in Permit Attachment **B.C7**, by performing radiography or visual examination
46 of a representative subpopulation of certified waste containers, to ensure that the wastes meet
47 the applicable requirements of the TSDF-WAC.

1 BC-0a Waste Characterization

2 Characterization requirements for individual containers of TRU mixed waste are specified on a
3 waste stream basis. A waste stream is defined as waste material ~~generated from a single~~
4 ~~process or from an activity that 1)~~ is similar in material, physical form, and hazardous
5 constituents, and 2) is or was generated from a single process or activity. Waste streams are
6 grouped by Waste Matrix Code Groups related to the physical and chemical properties of the
7 waste. Generator/storage sites shall use the characterization techniques described in this WAP
8 to assign appropriate Waste Matrix Code Groups to waste streams for WIPP disposal. The
9 Waste Matrix Code Groups are solidified inorganics, solidified organics, salt waste, soils,
10 lead/cadmium metal, inorganic nonmetal waste, combustible waste, graphite, filters,
11 heterogeneous debris waste, and uncategorized metal. Waste Matrix Code Groups can be
12 grouped into three Summary Category groups: Homogeneous Solids (Summary Category
13 S3000), Soil/Gravel (Summary Category S4000), and Debris Waste (Summary Category
14 S5000).

15 TRU mixed wastes are initially categorized into the three broad Summary Category Groups that
16 are related to the final physical form of the wastes. Waste characterization requirements for
17 these groups are specified separately in Section B.C-2 of this WAP. Each of the three groups is
18 described below.

19 S3000 - Homogeneous Solids

20 Homogeneous solids are defined as solid materials, excluding soil, that do not meet the
21 NMED criteria for classification as debris (20.4.1.800 NMAC (incorporating 40 CFR
22 §268.2[g] and [h])). Included in the series of homogeneous solids are inorganic process
23 residues, inorganic sludges, salt waste, and pyrochemical salt waste. Other waste streams
24 are included in this Summary Category Group based on the specific waste stream types
25 and final waste form. This Summary Category Group is expected to contain toxic metals
26 and spent solvents. This category includes wastes that are at least 50 percent by volume
27 homogeneous solids.

28 S4000 - Soils/Gravel

29 This Summary Category Group includes S4000 waste streams that are at least 50 percent
30 by volume soil/gravel. This Summary Category Group is expected to contain toxic metals.

31 S5000 - Debris Wastes

32 This Summary Category Group includes heterogeneous waste that is at least 50 percent
33 by volume materials that meet the criteria specified in 20.4.1.800 NMAC (incorporating 40
34 CFR §268.2 (g)). Debris means solid material exceeding a 2.36 inch (in.) (60 millimeter)
35 particle size that is intended for disposal and that is:

- 36 1. a manufactured object, or
37 2. plant or animal matter, or
38 3. natural geologic material.

39 Particles smaller than 2.36 inches in size may be considered debris if the debris is a
40 manufactured object and if it is not a particle of S3000 or S4000 material.

41 If a waste does not include at least 50 percent of any given Summary Category Group by
42 volume, characterization shall be performed using the waste characterization process required

1 for the category constituting the greatest volume of waste for that waste stream (see Section-B
2 C-3d).

3 The most common hazardous constituents in the TRU mixed waste to be managed in the WIPP
4 facility consist of the following:

5 Metals

6 Some of the TRU mixed waste to be emplaced in the WIPP facility contains metals for
7 which 20.4.1.200 NMAC (incorporating 40 CFR §261.24), toxicity characteristics were
8 established (EPA hazardous waste numbers D004 through D011). Cadmium, chromium,
9 lead, mercury, selenium, and silver are present in discarded tools and equipment,
10 solidified sludges, cemented laboratory liquids, and waste from decontamination and
11 decommissioning activities. A large percentage of the waste consists of lead-lined
12 gloveboxes, leaded rubber gloves and aprons, lead bricks and piping, lead tape, and other
13 lead items. Lead, because of its radiation-shielding applications, is the most prevalent
14 toxicity-characteristic metal present.

15 Halogenated Volatile Organic Compounds

16 Some of the TRU mixed waste to be emplaced in the WIPP facility contains spent
17 halogenated volatile organic compound (**VOC**) solvents identified in 20.4.1.200 NMAC
18 (incorporating 40 CFR, §261.31) (EPA hazardous waste numbers F001 through F005).
19 Tetrachloroethylene; trichloroethylene; methylene chloride; carbon tetrachloride; 1,1,1-
20 trichloroethane; and 1,1,2-trichloro-1,2,2-trifluoroethane (EPA hazardous waste numbers
21 F001 and F002) are the most prevalent halogenated organic compounds identified in TRU
22 mixed waste that may be managed at the WIPP facility during the Disposal Phase. These
23 compounds are commonly used to clean metal surfaces prior to plating, polishing, or
24 fabrication; to dissolve other compounds; or as coolants. Because they are highly volatile,
25 only small amounts typically remain on equipment after cleaning or, in the case of treated
26 wastewaters, in the sludges after clarification and flocculation. Radiolysis may also
27 generate halogenated volatile organic compounds.

28 Nonhalogenated Volatile Organic Compounds

29 Xylene, methanol, and n-butanol are the most prevalent nonhalogenated VOCs in TRU
30 mixed waste that may be managed at the WIPP facility during the Disposal Phase. Like
31 the halogenated VOCs, they are used as degreasers and solvents and are similarly
32 volatile. The same analytical methods that are used for halogenated VOCs are used to
33 detect the presence of nonhalogenated VOCs. Radiolysis may also generate non-
34 halogenated volatile organic compounds.

35 The generator/storage sites shall characterize their waste in accordance with this WAP and
36 associated Permit Attachments, and ensure that waste proposed for storage and disposal at
37 WIPP meets the applicable requirements of the TSDf-WAC in Module II. The generator/storage
38 site shall assemble the Acceptable Knowledge (**AK**) information into an auditable record¹ for the

¹ "Auditable records" mean those records which allow the Permittees to conduct a systematic assessment, analysis, and evaluation of the Permittees' compliance with the WAP and this Permit.

1 waste stream as described in Permit Attachment B_C4. For those waste streams with an
2 approved AK Sufficiency Determination (see below), sampling and analysis per the methods
3 described in Permit Attachments B_C1 and B_C2 are not required.

4 All waste characterization activities specified in this WAP and associated Permit Attachments
5 shall be carried out at generator/storage sites and Permittee-DOE approved laboratories in
6 accordance with this WAP. The Permittees-DOE will audit generator/storage site waste
7 characterization programs and activities as described in Section B_C-3. Waste characterization
8 activities at the generator/storage sites include the following, although not all these techniques
9 will be used on each container, as discussed in Section B_C-3:

- 10 • Radiography, which is an x-ray technique to determine physical contents of containers
- 11 • Visual examination of opened containers as an alternative way to determine their
12 physical contents
- 13 • Headspace-gas sampling to determine VOC content of gases in the void volume of the
14 containers
- 15 • Sampling and analysis of waste forms that are homogeneous and can be
16 representatively sampled to determine concentrations of hazardous waste constituents
17 and toxicity characteristic contaminants of waste in containers
- 18 • Compilation of AK documentation into an auditable record

19 BC-0b AK Sufficiency Determination

20 Generator/storage sites may submit a request to the Permittees-DOE for an AK Sufficiency
21 Determination (**Determination Request**) to meet all or part of the waste characterization
22 requirements. The contents of the Determination Request are specified in Permit Attachment B
23 C4, Section B_C4-3d. The Determination Request may take one of the following forms:

- 24 Scenario 1 Radiography or visual examination (**VE**) of the waste stream is not required,
25 and chemical sampling and analysis is not required;
- 26 Scenario 2 Radiography or VE of the waste stream is not required, but chemical
27 sampling and analysis of a representative sample of the waste stream is
28 required; or
- 29 Scenario 3 Chemical sampling and analysis is not required, but radiography or VE of
30 100% of the containers in the waste stream is required.

31 The Permittees-DOE shall evaluate the Determination Request for completeness and technical
32 adequacy. This evaluation shall include, but not be limited to whether the Determination
33 Request is technically sufficient for the following:

- 34 • The Determination Request must include all information specified in Permit Attachment
35 B_C4, Section B_C4-3d

- 1 • The AK Summary must identify relevant hazardous constituents, and must correctly
2 identify all toxicity characteristic and listed hazardous waste numbers.
- 3 • All hazardous waste number assignments must be substantiated by supporting data
4 and, if not, whether this lack of substantiation compromises the interpretation.
- 5 • Resolution of data discrepancies between different AK sources must be technically
6 correct and documented.
- 7 • The AK Summary must include all the identification of waste material parameter
8 weights by percentage of the material in the waste stream, and determinations must
9 be technically correct.
- 10 • All prohibited items specified in the TSDF-WAC should be addressed, and conclusions
11 drawn must be technically adequate and substantiated by supporting information.
- 12 • If the AK record includes process control information specified in Permit Attachment-B
13 C4, Section-B C4-3b, the information should include procedures, waste manifests, or
14 other documentation demonstrating that the controls were adequate and sufficient.
- 15 • The site must provide the supporting information necessary to substantiate technical
16 conclusions within the Determination Request, and this information must be correctly
17 interpreted.

18 | ~~The Permittees-DOE~~ will review the Determination Request for technical adequacy and
19 compliance with the requirements of the Permit, using trained and qualified individuals in
20 accordance with standard operating procedures that shall, at a minimum, address all of the
21 technical and procedural requirements listed above. ~~The Permittees-DOE~~ shall resolve
22 comments with the generator/storage site, and ~~the Permittees-DOE~~ may change the scope of
23 the Determination Request to one of the three scenarios. If ~~the Permittees-DOE~~ determines
24 that the AK is sufficient, they will provisionally approve the Determination Request and forward it
25 along with all relevant information submitted with the Determination Request to NMED for an
26 evaluation that the provisional approval made by ~~the Permittees-DOE~~ is adequate. Within five
27 (5) days of submitting a Determination Request to NMED, the Permittees will post a link to the
28 transmittal letter to NMED on the WIPP Home Page and inform those on the e-mail notification
29 list. Based on the results of NMED's evaluation, ~~the Permittees-DOE~~ will notify the
30 generator/storage sites whether the AK information is sufficient and the Determination Request
31 is approved. ~~The Permittees-DOE~~ will not approve a Determination Request that NMED has
32 determined to be inadequate unless the generator/storage site resolves the inadequacies and
33 provides the resolution to NMED for evaluation of adequacy. Should the inadequacies not be
34 resolved to NMED's satisfaction, ~~the Permittees-DOE~~ shall not submit a Determination Request
35 for the same waste stream at a later date.

36 | In the event ~~the Permittees-DOE~~ disagrees, in whole or in part, with an evaluation performed by
37 NMED resulting in a determination by NMED that ~~the Permittees'-DOE's~~ provisional approval for
38 a particular waste stream is inadequate, ~~the Permittees-DOE~~ may seek dispute resolution. The
39 dispute resolution process is specified in ~~Module-I Part 1~~.

1 If a generator/storage site does not submit a Determination Request, or if ~~the Permittees-DOE~~
2 ~~does~~ not approve a Determination Request, or if NMED finds that ~~the Permittees' DOE's~~
3 provisional approval of a Determination Request is inadequate, the generator/storage site shall
4 perform radiography or VE on 100% of the containers in a waste stream and chemical sampling
5 and analysis on a representative sample of the waste stream using headspace gas sampling
6 and analysis (for debris waste) or solids sampling and analysis (for homogeneous solid or
7 soil/gravel waste) as specified in Permit Attachments ~~B_C1~~ and ~~B_C2~~.

8 If a generator/storage site submits a Determination Request, ~~the Permittees-DOE~~ provisionally
9 approves the Determination Request as Scenario 1, and NMED finds that ~~the Permittees'~~
10 ~~DOE's~~ provisional approval is adequate, neither radiography or VE nor chemical sampling and
11 analysis of the waste stream is required.

12 If a generator/storage site submits a Determination Request, ~~the Permittees-DOE~~ provisionally
13 approves the Determination Request as Scenario 2, and NMED finds that ~~the Permittees'~~
14 ~~DOE's~~ provisional approval is adequate, chemical sampling and analysis of a representative
15 sample of the waste stream is required, but radiography or VE is not required.

16 If a generator/storage site submits a Determination Request, ~~the Permittees-DOE~~ provisionally
17 approves the Determination Request as Scenario 3, and NMED finds that ~~the Permittees'~~
18 ~~DOE's~~ provisional approval is adequate, radiography or VE of 100% of the containers in the
19 waste stream is required, but chemical sampling and analysis is not required.

20 BC-0c Waste Stream Profile Form Completion

21 After a complete AK record has been compiled and either a Determination Request has been
22 approved by ~~the Permittees-DOE~~ or the generator/storage site has completed the applicable
23 representative sampling and analysis requirements specified in Permit Attachments ~~B_C1~~ and ~~B~~
24 ~~C2~~, the generator/storage site will complete a Waste Stream Profile Form (WSPF) and
25 Characterization Information Summary (CIS). The requirements for the completion of a WSPF
26 and a CIS are specified in Permit Attachment ~~B_C3~~, Sections ~~B_C3-12b(1)~~ and ~~B_C3-12b(2)~~
27 respectively.

28 The WSPF and the CIS for the waste stream resulting from waste characterization activities
29 shall be transmitted to ~~the Permittees DOE~~, reviewed for completeness, and screened for
30 acceptance prior to loading any TRU mixed waste into the Contact-Handled or Remote-Handled
31 Packaging at the generator facility, as described in Section ~~B_C-4~~. The review and approval
32 process will ensure that the submitted waste analysis information is sufficient to meet the Data
33 Quality Objectives (DQOs) for AK in Section ~~B_C-4a(1)~~ and allow ~~the Permittees-DOE~~ to
34 demonstrate compliance with the requirements of this WAP. Only TRU mixed waste and TRU
35 waste that has been characterized in accordance with this WAP and that meets the **TSDF-WAC**
36 specified in this Permit will be accepted at the WIPP facility for disposal in a permitted
37 Underground Hazardous Waste Disposal Unit (HWDU). ~~The Permittees-DOE~~ will provide NMED
38 with copies of the approved WSPF and accompanying CIS prior to waste stream shipment.
39 Upon notification of approval of the WSPF by ~~the Permittees DOE~~, the generator/storage site
40 may be authorized to ship waste to WIPP.

41 In the event ~~the Permittees-DOE~~ requests detailed information on a waste stream, the site will
42 provide a Waste Stream Characterization Package (Section ~~B_C3-12b(2)~~). For each waste
43 stream, this package will include the WSPF, the CIS, and the complete AK summary. The

1 Waste Stream Characterization Package will also include specific Batch Data Reports (**BDRs**)
2 and raw analytical data associated with waste container characterization as requested by ~~the~~
3 Permittees DOE.

4 BC-0d Waste Confirmation

5 ~~The Permittees DOE~~ will perform waste confirmation on a representative subpopulation of each
6 waste stream shipment after certification and prior to shipment as described in Permit
7 Attachment BC7. ~~The Permittees DOE~~ will use radiography, review of radiography audio/video
8 recordings, **VE**, or review of VE records (e.g., VE data sheets or packaging logs) to examine at
9 least 7 percent of each waste stream shipment to confirm that the waste does not contain
10 ignitable, corrosive, or reactive waste. Waste confirmation will be performed by ~~the Permittees~~
11 DOE prior to shipment of the waste from the generator/storage site to WIPP.

12 BC-1 Identification of TRU Mixed Waste to be Managed at the WIPP Facility

13 BC-1a Waste Stream Identification

14 TRU mixed waste destined for disposal at WIPP will be characterized on a waste stream basis.
15 Generator/storage sites will delineate waste streams using acceptable knowledge. Required
16 acceptable knowledge is specified in Section BC-3b and Permit Attachment BC4.

17 All of the waste within a waste stream may not be accessible for sampling and analysis at one
18 time. Permit Attachment BC2 addresses the requirements for selecting waste containers used
19 for characterization of waste streams as they are generated or retrieved.

20 BC-1b Waste Summary Category Groups and Hazardous Waste Accepted at the WIPP Facility

21 Once a waste stream has been delineated, generator/storage sites will assign a Waste Matrix
22 Code to the waste stream based on the physical form of the waste. Waste streams are then
23 assigned to one of three broad Summary Category Groups; S3000-Homogeneous Solids,
24 S4000-Soils/Gravel, and S5000-Debris Wastes. These Summary Category Groups are used to
25 determine further characterization requirements.

26 ~~The Permittees DOE~~ will only allow generators to ship those TRU mixed waste streams with
27 EPA hazardous waste numbers listed in Table BC-9. Some of the waste may also be identified
28 by unique state hazardous waste codes or numbers. These wastes are acceptable at WIPP as
29 long as the TSDf-WAC are met. ~~The Permittees DOE~~ will require sites to perform
30 characterization of all waste streams as required by this WAP. If during the characterization
31 process, new EPA hazardous waste numbers are identified, those wastes will be prohibited for
32 disposal at the WIPP facility until a permit modification has been submitted to and approved by
33 NMED for these new EPA hazardous waste numbers. Similar waste streams at other
34 generator/storage sites will be examined by ~~the Permittees DOE~~ to ensure that the newly
35 identified EPA hazardous waste numbers do not apply to those similar waste streams. If the
36 other waste streams also require new EPA hazardous waste numbers, shipment of these similar
37 waste streams will also be prohibited for disposal until a permit modification has been submitted
38 to and approved by NMED.

1 BC-1c Waste Prohibited at the WIPP Facility

2 The following TRU mixed waste are prohibited at the WIPP facility:

- 3 • liquid waste is not acceptable at WIPP. Liquid in the quantities delineated below is
4 acceptable:
- 5 – Observable liquid shall be no more than 1 percent by volume of the outermost
6 container at the time of radiography or visual examination
- 7 – Internal containers with more than 60 milliliters or 3 percent by volume observable
8 liquid, whichever is greater, are prohibited
- 9 – Containers with Hazardous Waste Number U134 assigned shall have no
10 observable liquid
- 11 – Overpacking the outermost container that was examined during radiography or
12 visual examination or redistributing untreated liquid within the container shall not be
13 used to meet the liquid volume limits
- 14 • non-radionuclide pyrophoric materials, such as elemental potassium
- 15 • hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-
16 mixed hazardous wastes)
- 17 • wastes incompatible with backfill, seal and panel closures materials, container and
18 packaging materials, shipping container materials, or other wastes
- 19 • wastes containing explosives or compressed gases
- 20 • wastes with polychlorinated biphenyls (**PCBs**) not authorized under an EPA PCB
21 waste disposal authorization
- 22 • wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA
23 Hazardous Waste Numbers of D001, D002, or D003)
- 24 • waste that has ever been managed as high-level waste and waste from tanks specified
25 in Table BC-8, unless specifically approved through a Class 3 permit modification
- 26 • any waste container from a waste stream (or waste stream lot) which has not
27 undergone either radiographic or visual examination of a statistically representative
28 subpopulation of the waste stream in each shipment, as described in Permit
29 Attachment BC7
- 30 • any waste container from a waste stream which has not been preceded by an
31 appropriate, certified WSPF (see Section BC-1d)

32 Before accepting a container holding TRU mixed waste, ~~the Permittees DOE~~ will perform waste
33 confirmation activities on each waste stream shipment to confirm that the waste does not
34 contain ignitable, corrosive, or reactive waste and the assigned EPA hazardous waste numbers

1 are allowed for storage and disposal by this Permit. Waste confirmation activities will be
2 performed on at least 7 percent of each waste stream shipped, equating to examination of at
3 least one of fourteen containers in each waste stream shipment. If a waste stream shipment
4 contains fewer than fourteen containers, one container will be examined to satisfy waste
5 confirmation requirements. Section B C-4 and Permit Attachment B C7 include descriptions of
6 the waste confirmation processes that ~~the Permittees-DOE~~ will conduct prior to receiving a
7 shipment at the WIPP facility.

8 Containers are vented through filters, allowing any gases that are generated by radiolytic and
9 microbial processes within a waste container to escape, thereby preventing over pressurization
10 or development of conditions within the container that would lead to the development of
11 ignitable, corrosive, reactive, or other characteristic wastes.

12 To ensure the integrity of the WIPP facility, waste streams identified to contain incompatible
13 materials or materials incompatible with waste containers cannot be shipped to WIPP unless
14 they are treated to remove the incompatibility. Only those waste streams that are compatible or
15 have been treated to remove incompatibilities will be shipped to WIPP.

16 BC-1d Control of Waste Acceptance

17 Every waste stream shipped to WIPP shall be preceded by a WSPF (Figure B C-1) and a CIS.
18 The required WSPF information and the CIS elements are found in Section B C3-12b(1) and
19 Section B C3-12b(2).

20 Generator/storage sites will provide the WSPF to ~~the Permittees-DOE~~ for each waste stream
21 prior to its acceptance for disposal at WIPP. The WSPF and the CIS will be transmitted to ~~the~~
22 ~~Permittees-DOE~~ for each waste stream from a generator/storage site. If continued waste
23 characterization reveals discrepancies that identify different hazardous waste numbers or
24 indicates that the waste belongs to a different waste stream, the waste will be redefined to a
25 separate waste stream and a new WSPF submitted. Generator/storage sites will develop criteria
26 to determine the specific circumstances under which a WSPF is revised versus when a new
27 WSPF is required. These criteria will be evaluated by DOE during site audits (Attachment C6).

28 ~~The Permittees-DOE~~ is responsible for the review of WSPFs and CISs to verify compliance
29 with the restrictions on TRU mixed wastes for WIPP disposal. ~~The Permittees-DOE~~ will submit
30 completed WSPFs to NMED prior to waste stream shipment. The Permittees will ~~also~~ be
31 responsible for the review of shipping records (Section B C-5) to ~~confirm~~ ensure that each waste
32 container has been prepared and characterized in accordance with applicable provisions of this
33 WAP. Waste characterization data shall ensure the absence of prohibited items specified in
34 Section B C-1c.

35 As stated in the Introduction of this WAP, any time ~~the Permittees-DOE~~ requests additional
36 information concerning a waste stream, the generator/storage site will provide a Waste Stream
37 Characterization Package (Section B C3-12b(2)). The option for ~~the Permittees-DOE~~ to request
38 additional information ensures that the waste being offered for disposal is adequately
39 characterized and accurately described on the WSPF.

1 BC-1e Waste Generating Processes at the WIPP Facility

2 Waste generated as a result of the waste containers handling and processing activities at the
3 WIPP facility is termed “derived” waste. Because derived wastes can contain only those RCRA-
4 regulated materials present in the waste from which they were derived, no additional
5 characterization of the derived waste is required for disposal purposes. In other words, the
6 generator/storage site’s characterization data and knowledge of the processes at the WIPP
7 facility will be used to identify and characterize hazardous waste and hazardous constituents in
8 derived waste. The management of derived waste is addressed in Permit Attachment MA1.

9 BC-2 Waste Characterization Program Requirements and Waste Characterization Parameters

10 ~~The Permittees-DOE~~ shall require the sites to develop the procedure(s) which specify their
11 programmatic waste characterization requirements. ~~The Permittees-DOE~~ will evaluate the
12 procedures during audits conducted under the ~~Permittees’-DOE~~ Audit and Surveillance Program
13 (Section BC-5a(3)) and may also evaluate the procedures as part of the review and approval of
14 the WSPF. Sites must notify ~~the Permittees-DOE~~ and obtain approval prior to making data-
15 affecting modifications to procedures (Permit Attachment BC3, Section BC3-15). Program
16 procedures shall address the following minimum elements:

- 17 • Waste characterization and certification procedures for retrievably stored and newly
18 generated wastes to be sent to the WIPP facility
- 19 • Methods used to ensure prohibited items are documented and managed. These will
20 include procedures for performing radiography, VE, or treatment, if these methods are
21 used to ensure prohibited items are not present in the waste prior to shipment of the
22 waste to WIPP.
- 23 • Procedures used to verify packaging configurations to determine the correct drum age
24 criteria (**DAC**) if headspace gas sampling and analysis is used to collect waste
25 characterization information per Section BC1-1a(1) of the WAP.
- 26 • Identify the organization(s) responsible for compliance with waste characterization and
27 certification procedures.
- 28 • Identify the oversight procedures and frequency of actions to verify compliance with
29 waste characterization and certification procedures.
- 30 • Develop training specific to waste characterization and certification procedures.
- 31 • Ensure that personnel may stop work if noncompliance with waste characterization or
32 certification procedures is identified.
- 33 • Develop a nonconformance process that complies with the requirements in Permit
34 Attachment BC3 of the WAP to document and establish corrective actions.
- 35 • As part of the corrective action process, assess the potential time frame of the
36 noncompliance, the potentially affected waste population(s), and the reassessment
37 and recertification of those wastes.

- 1 • A listing of all approved hazardous waste numbers which are acceptable at WIPP are
2 included in Table BC-9.

3 For those waste streams or containers that are not amenable to radiography (e.g., RH TRU
4 mixed waste, direct loaded ten-drum overpacks (TDOPs)) for waste confirmation by ~~the~~
5 Permittees-DOE as described in Permit Attachment BC7, generator/storage site VE data may
6 be used for waste acceptance. In those cases, ~~the Permittees-DOE~~ will review the
7 generator/storage site VE procedures to ensure that data sufficient for ~~the Permittees'-DOE's~~
8 waste acceptance activities as described in Permit Attachment BC7 will be obtained and the
9 procedures meet the minimum requirements for visual examination specified in Permit
10 Attachment BC1, Section BC1-3.

11 The following waste characterization parameters shall be obtained from the generator/storage
12 sites:

- 13 • Determination whether TRU mixed waste streams comply with the applicable
14 provisions of the TSDF-WAC
- 15 • Determination whether TRU mixed wastes exhibit a hazardous characteristic
16 (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart C)
- 17 • Determination whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating
18 40 CFR §261 Subpart D)
- 19 • Estimation of waste material parameter weights

20 Tables BC-1, BC-2, BC-3 and BC-4 provide the parameters of interest for the various
21 constituent groupings and analytical methodologies. The following sections provide a
22 description of the acceptable methods to evaluate these parameters for each waste Summary
23 Category Group.

24 BC-3 Generator Waste Characterization Methods

25 The characterization techniques used by generator/storage sites includes acceptable
26 knowledge and may also include, as necessary, headspace-gas sampling and analysis,
27 radiography, visual examination, and homogeneous waste sampling and analysis. All
28 characterization activities are performed in accordance with the WAP. Table BC-5 provides a
29 summary of the characterization requirements for TRU mixed waste.

30 BC-3a Sampling and Analytical Methods

31 BC-3a(1) Headspace Gas Sampling and Analysis

32 Representative headspace gas sampling and analysis shall be used by generator/storage sites
33 to determine the types and concentrations of VOCs in the void volume of randomly selected
34 waste containers in order to resolve the assignment of EPA hazardous waste numbers for those
35 debris waste streams for which an AK Sufficiency Determination Request has not been
36 approved by ~~the Permittees-DOE~~. In addition, VOC constituents will be compared to those
37 assigned by acceptable knowledge, which may include an analysis of radiolytically derived
38 VOCs. The generator/storage sites may also consider radiolysis and packaging materials when

1 assessing the presence of hazardous constituents in the headspace gas results, and whether
2 radiolysis would generate wastes which exhibit the toxicity characteristic. Refer to Permit
3 Attachment-B C4 for additional clarification regarding hazardous waste number assignment and
4 headspace gas results. The methods for random selection of containers for headspace gas
5 sampling and analysis are specified in Permit Attachment-B C2. Headspace gas sampling and
6 analysis shall be subject to the Permittees' DOE Audit and Surveillance Program (Permit
7 Attachment-B C6).

8 In accordance with EPA convention, identification of hazardous constituents detected by gas
9 chromatography/mass spectrometry methods that are not on the list of target analytes shall be
10 reported. These compounds are reported as tentatively identified compounds (**TICs**) in the
11 analytical BDR and shall be added to the target analyte list if detected in a given waste stream,
12 if they appear in the 20.4.1.200 NMAC (incorporating 40 CFR §261) Appendix VIII, and if they
13 are reported in 25% of the waste containers sampled from a given waste stream. The
14 headspace gas analysis method Quality Assurance Objectives (**QAOs**) are specified in Permit
15 Attachment-B C3.

16 BC-3a(2) Homogeneous and Soil/Gravel Waste Sampling and Analysis

17 Representative homogeneous and soil/gravel waste sampling and analysis shall be used by
18 generator/storage sites to resolve the assignment of EPA hazardous waste numbers for
19 homogeneous and soil/gravel waste streams for which an AK Sufficiency Determination
20 Request has not been approved by ~~the~~ Permittees DOE. Sampling of homogeneous and
21 soil/gravel wastes shall result in the collection of a sample that is used to resolve the
22 assignment of hazardous waste numbers. Sampling is accomplished through coring or other
23 EPA approved sampling, which is described in Permit Attachment-B C1. For those waste
24 streams defined as Summary Category Groups S3000 or S4000 on page-B C-3, debris that may
25 also be present within these wastes need not be sampled. The waste containers for sampling
26 and analysis are to be selected randomly from the population of containers for the waste
27 stream. The random selection methodology is specified in Permit Attachment-B C2.
28 Homogeneous and soil/gravel sampling and analysis shall be subject to the Permittees' DOE
29 Audit and Surveillance Program (Permit Attachment-B C6).

30 Totals or TCLP analyses for VOCs, SVOCs, and RCRA-regulated metals are used to determine
31 waste parameters in soils/gravels and solids that may be important to the performance within
32 the disposal system (Tables-B C-3 and-B C-4). To determine if a waste exhibits a toxicity
33 characteristic for compounds specified in 20.4.1.200 NMAC (incorporating 40 CFR §261,
34 Subpart C), TCLP may be used instead of total analyses. The generator will use the results from
35 these analyses to determine if a waste exhibits a toxicity characteristic. The mean concentration
36 of toxicity characteristic contaminants are calculated for each waste stream such that it can be
37 reported with an upper 90 percent confidence limit (**UCL₉₀**). The UCL₉₀ values for the mean
38 measured contaminant concentrations in a waste stream will be compared to the specified
39 regulatory levels in 20.4.1.200 NMAC (incorporating 40 CFR §261 Subpart C), expressed as
40 total/TCLP values, to determine if the waste stream exhibits a toxicity characteristic. A
41 comparison of total analyses and TCLP analyses is presented in Appendix C3 of the WIPP
42 RCRA Part B Permit Application (DOE, 1997), and a discussion of the UCL₉₀ is included in
43 Permit Attachment-B C2. If toxicity characteristic (**TC**) wastes are identified, these will be
44 compared to those determined by acceptable knowledge and TC waste numbers will be revised,
45 as warranted. Refer to Permit Attachment-B C4 for additional clarification regarding hazardous
46 waste number assignment and homogeneous solid and soil/gravel analytical results.

1 | BC-3a(3) Laboratory Qualification

2 | ~~The Permittees DOE~~ will ensure that generator/storage sites conduct analyses using
3 | laboratories that are qualified through participation in the Performance Demonstration Program
4 | (PDP) (DOE, 2003, 2005). Required QAOs are specified in Permit Attachment B C3. In addition,
5 | methods and supporting performance data demonstrating QAO compliance shall be ensured by
6 | ~~the Permittees DOE~~ during the annual certification audit of the laboratories.

7 | Analytical methods used by the laboratories shall: 1) satisfy all of the appropriate QAOs, and 2)
8 | be implemented through laboratory-documented standard operating procedures. These
9 | analytical QAOs are discussed in detail in Permit Attachment B C3.

10 | BC-3b Acceptable Knowledge

11 | Acceptable knowledge (AK) is used in TRU mixed waste characterization activities in five ways:

- 12 | • To delineate TRU mixed waste streams
- 13 | • To assess whether TRU mixed wastes comply with the TSDF-WAC
- 14 | • To assess whether TRU mixed wastes exhibit a hazardous characteristic (20.4.1.200
15 | NMAC, incorporating 40 CFR §261 Subpart C)
- 16 | • To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating 40
17 | CFR §261 Subpart D)
- 18 | • To estimate waste material parameter weights

19 | Acceptable knowledge is discussed in detail in Permit Attachment B C4, which outlines the
20 | minimum set of requirements and DQOs which shall be met by the generator/storage sites in
21 | order to use acceptable knowledge. In addition, Section B C-5a(3) of this permit attachment
22 | describes the assessment of acceptable knowledge through the ~~Permittees' DOE~~ Audit and
23 | Surveillance Program.

24 | BC-3c Radiography and Visual Examination

25 | Radiography and visual examination (VE) are nondestructive qualitative and quantitative
26 | techniques used to identify and verify waste container contents as specified in Permit
27 | Attachment B1. Generator/storage sites shall perform radiography or VE of 100 percent of CH
28 | TRU mixed waste containers in waste streams except for those waste streams for which ~~the~~
29 | ~~Permittees DOE~~ approves a Scenario 1 or Scenario 2 Determination Request. No RH TRU
30 | mixed waste will be shipped to WIPP for storage or disposal without documentation of
31 | radiography or VE of 100 percent of the containers as specified in Permit Attachment B C1.
32 | Radiography and/or VE will be used, when necessary, to examine a waste container to verify its
33 | physical form. These techniques can detect observable liquid in excess of TSDF-WAC limits
34 | and containerized gases, which are prohibited for WIPP disposal. The prohibition of liquid in
35 | excess of TSDF-WAC limits and containerized gases prevents the shipment of corrosive,
36 | ignitable, or reactive wastes. Radiography and/or VE are also able to ~~confirm~~ verify that the
37 | physical form of the waste matches its waste stream description (i.e. Homogeneous Solids,
38 | Soil/Gravel, or Debris Waste [including uncategorized metals]). If the physical form does not

1 match the waste stream description, the waste will be designated as another waste stream and
2 assigned the preliminary hazardous waste numbers associated with that new waste stream
3 assignment. That is, if radiography and/or VE indicates that the waste does not match the waste
4 stream description arrived at by acceptable knowledge characterization, a non-conformance
5 report (**NCR**) will be completed and the inconsistency will be resolved as specified in Permit
6 Attachment **B C**4, and the NCR will be dispositioned as specified in Permit Attachment **B C**3,
7 Section **B C**3-13. The proper waste stream assignment will be determined (including
8 preparation of a new WSPF), the correct hazardous waste numbers will be assigned, and the
9 resolution will be documented. Refer to Permit Attachment **B C**4 for a discussion of acceptable
10 knowledge and its verification process.

11 For generator/storage sites that use VE, the detection of any liquid in non-transparent internal
12 containers, detected from shaking the internal container, will be handled by assuming that the
13 internal container is filled with liquid and adding this volume to the total liquid in the container
14 being characterized using VE. The container being characterized using VE would be rejected
15 and/or repackaged to exclude the internal container if it is over the TSDf-WAC limits. When
16 radiography is used, or visual examination of transparent containers is performed, if any liquid in
17 internal containers is detected, the volume of liquid shall be added to the total for the container
18 being characterized using radiography or VE. Radiography, or the equivalent, will be used as
19 necessary on the existing/stored waste containers to verify the physical characteristics of the
20 TRU mixed waste correspond with its waste stream identification/waste stream Waste Matrix
21 Code and to identify prohibited items. Radiographic examination protocols and QA/QC methods
22 are provided in Permit Attachment **B C**1. Radiography and VE shall be subject to the
23 **Permittees' DOE** Audit and Surveillance Program (Permit Attachment **B C**6).

24 **BC-3d Characterization Techniques and Frequency for Newly Generated and Retrievably**
25 **Stored Waste**

26 Generator/storage sites will use acceptable knowledge to delineate all TRU mixed waste
27 containers into waste streams for the purposes of grouping waste for further characterization.
28 The analyses performed may differ based on the waste stream and the physical form of the
29 waste (i.e., heterogeneous debris waste cannot be sampled for totals analyses). Both
30 retrievably stored and newly generated wastes will be delineated in this fashion, though the
31 types of acceptable knowledge used may differ. Section **B C**3b discusses the use of acceptable
32 knowledge, sampling, and analysis in more detail. Acceptable knowledge is discussed more
33 completely in Permit Attachment **B C**4. Every TRU mixed waste stream will be assigned
34 hazardous waste numbers based upon acceptable knowledge, and the generator/storage sites
35 may resolve the assignment of hazardous waste numbers using headspace gas (Summary
36 Category Group S5000 only) and solid sampling and analysis (Summary Category Groups
37 S3000 and S4000 only).

38 In the CIS for each waste stream, the generator/storage site will be required to document their
39 methods, and the findings from those methods, for determining the physical form of the waste
40 and the presence or absence of prohibited items for both retrievably stored and newly
41 generated waste. Radiography and/or VE may be used to verify the physical form of retrievably
42 stored TRU mixed waste. For newly generated waste, physical form and prohibited items may
43 either be documented during packaging using VE or verified after packaging using radiography
44 or VE.

1 | For debris waste streams that do not have an AK Sufficiency Determination approved by ~~the~~
2 | ~~Permittees DOE~~, containers selected in accordance with Permit Attachment ~~B C~~2 from those
3 | waste streams must be sampled and analyzed for VOCs in the headspace gas. Likewise, a
4 | statistically selected portion of homogeneous solids and soil/gravel waste streams must be
5 | sampled and analyzed for RCRA-regulated total VOCs, SVOCs, and metals when those waste
6 | streams do not have an AK Sufficiency Determination approved by ~~the Permittees DOE~~.
7 | Sampling and analysis methods used for waste characterization are discussed in Section ~~B C~~-
8 | 3a.

9 | In the process of performing organic headspace and solid sample analyses, nontarget
10 | compounds may be identified. These compounds will be reported as TICs. TICs reported in
11 | 25% of the samples and listed in 20.4.1.200 NMAC (incorporating 40 CFR §261) Appendix VIII,
12 | will be compared with acceptable knowledge data to determine if the TIC is in a listed
13 | hazardous waste in the waste stream. TICs identified through headspace gas analyses that
14 | meet the Appendix VIII list criteria and the 25 percent reporting criteria for a waste stream will
15 | be added to the headspace gas waste stream target list, regardless of the hazardous waste
16 | listing associated with the waste stream. TICs subject to inclusion on the target analyte list that
17 | are toxicity characteristic parameters shall be added to the target analyte list regardless of origin
18 | because the hazardous waste designation for these numbers is not based on source. However,
19 | for toxicity characteristic and non-toxic F003 constituents, the site may take concentration into
20 | account when assessing whether to add a hazardous waste number. TICs reported from the
21 | Totals VOC or SVOC analyses may be excluded from the target analyte list for a waste stream
22 | if the TIC is a constituent in an F-listed waste whose presence is attributable to waste packaging
23 | materials or radiolytic degradation from acceptable knowledge documentation. If the TIC
24 | associated with a total VOC or SVOC analysis cannot be identified as a component of waste
25 | packaging materials or as a product of radiolysis, the generator/storage site will add these TICs
26 | to the list of hazardous constituents for the waste stream (and assign additional EPA listed
27 | hazardous waste numbers, if appropriate). A permit modification will be submitted to NMED for
28 | their approval to add these constituents (and waste numbers), if necessary. For toxicity
29 | characteristic compounds and non-toxic F003 constituents, the generator/storage site may
30 | consider waste concentration when determining whether to change a hazardous waste number.
31 | Refer to Permit Attachment ~~B C~~3 for additional information on TIC identification.

32 | Waste characterization solid sampling and analysis activities may differ for retrievably stored
33 | waste and newly generated waste. The waste characterization processes used by the
34 | generator/storage sites for both retrievably stored and newly generated waste streams will be
35 | evaluated during ~~the Permittees' DOE's~~ audit of the site. The typical waste characterization data
36 | collection design used by the generator/storage sites for each type of waste is described in the
37 | following sections. Table ~~B C~~-1 provides a summary of hazardous waste characterization
38 | requirements for all TRU mixed waste by waste characterization parameters.

39 | Table ~~B C~~-5 summarizes the parameters, methods, and rationales for stored and newly
40 | generated CH TRU mixed wastes according to their waste forms.

41 | WIPP may accept TRU mixed waste that has been repackaged or treated. Treated waste shall
42 | retain the original waste stream's listed hazardous waste number designation.

1 BC-3d(1) Newly Generated Waste

2 The RCRA-regulated constituents in newly generated wastes will typically be documented at the
3 time of generation based on acceptable knowledge for the waste stream. Newly generated TRU
4 mixed waste characterization typically begins with verification that processes generating the
5 waste have operated within established written procedures. Waste containers are delineated
6 into waste streams using acceptable knowledge. ~~The Permittees DOE~~ will require that the
7 generator/storage sites document the methods used to delineate waste streams in the
8 acceptable knowledge record and Acceptable Knowledge Summary Report. Determination that
9 the physical form of the waste (Summary Category Group) corresponds to the physical form of
10 the assigned waste stream may be accomplished either using VE during packaging or by
11 performing radiography as specified in Permit Attachment ~~BC~~1, Section ~~BC~~1-3 for retrievably
12 stored waste. Instead of using a video/audio tape and a single operator, the VE method for
13 newly generated waste (or repackaged retrievably stored waste) may use a second operator,
14 who is equally trained to the requirements stipulated in Permit Attachment ~~BC~~1, to provide
15 additional verification by reviewing the contents of the waste container to ensure correct
16 reporting. If the second operator cannot provide concurrence, corrective actions² will be taken
17 as specified in Permit Attachment ~~BC~~3. The subsequent waste characterization activities
18 depend on the assigned Summary Category Group, since waste within the Homogeneous
19 Solids and Soils/Gravel Summary Category Groups may be characterized using different
20 techniques than the waste in the Debris Waste Summary Category Group. The packaging
21 configuration, type and number of filters, and rigid liner vent hole presence and diameter
22 necessary to determine the appropriate drum age criteria (**DAC**) in accordance with Permit
23 Attachment ~~BC~~1, Section ~~BC~~1-1, may be documented as part of the characterization
24 information collected during the packaging of newly generated waste or repackaging of
25 retrievably stored waste for those containers of debris waste that will undergo headspace gas
26 sampling and analysis.

27 BC-3d(1)(a) Sampling of Newly Generated Homogeneous Solids and Soil/Gravel

28 When a Determination Request has not been approved by ~~the Permittees DOE~~, sampling and
29 analysis of newly generated homogeneous solid and soil/gravel waste streams shall be
30 conducted in accordance with the requirements specified in Permit Attachment ~~BC~~1, Section ~~BC~~
31 ~~C~~1-2. The number of newly generated homogeneous solid and soil/gravel waste containers to
32 be sampled will be determined using the procedure specified in Section ~~BC~~2-1, wherein a
33 statistically selected portion of the waste will be sampled.

34 BC-3d(2) Retrievably Stored Waste

35 All retrievably stored waste containers will first be delineated into waste streams using
36 acceptable knowledge. ~~The Permittees DOE~~ will require that the generator/storage sites
37 document the methods used to delineate waste streams in the acceptable knowledge record
38 and Acceptable Knowledge Summary Report. Retrievably stored waste containers may be
39 examined using radiography or VE to determine the physical waste form (Summary Category
40 Group), the absence of prohibited items, and additional waste characterization techniques that
41 may be used based on the Summary Category Groups (i.e., S3000, S4000, S5000).

² "Corrective action" as used in this WAP and its attachments does not mean corrective action as defined under HWA, RCRA, and their implementing regulations.

1 | The headspace gas sampling method provided in Permit Attachment B_C1 will be used, when
2 | necessary, to resolve the assignment of EPA hazardous waste numbers to debris waste
3 | streams, as specified in Permit Attachment B_C4.

4 | A statistically selected portion of retrievably stored homogeneous solids and soil/gravel wastes
5 | will be sampled and analyzed for total VOCs, SVOCs, and metals, when necessary. The sample
6 | location selection method is described in Permit Attachment B_C2. The sampling methods for
7 | these wastes are provided in Permit Attachment B_C1.

8 | The toxicity characteristic of retrievably stored homogeneous solids and soil/gravel wastes will
9 | be determined using total analysis of toxicity characteristic parameters or TCLP. To determine if
10 | a waste exhibits a toxicity characteristic for compounds specified in 20.4.1.200 NMAC
11 | (incorporating 40 CFR §261, Subpart C), TCLP may be used instead of total analyses.
12 | Appendix C3 of the WIPP RCRA Part B Permit Application (DOE, 1997) discusses
13 | comparability of totals analytical results to those of the TCLP method.

14 | Representativeness of containers selected for headspace gas sampling and waste subjected to
15 | homogeneous solids and soil/gravel sampling and analysis will be validated by the
16 | generator/storage site and by the Permittees-DOE during an audit (Permit Attachment B_C6) via
17 | examination of documentation that shows that random samples were collected. (Because
18 | representativeness is a quality characteristic that expresses the degree to which a sample or
19 | group of samples represent the population being studied, the random sampling of waste
20 | streams ensures representativeness.)

21 | BC-4 Data Verification and Quality Assurance

22 | The Permittees-DOE will ensure that applicable waste characterization processes performed by
23 | generator/storage sites sending TRU mixed waste to the WIPP for disposal meets WAP
24 | requirements through data validation, usability and reporting controls. Verification occurs at
25 | three levels: 1) the data generation level, 2) the project level, and 3) the Permittee-DOE level.
26 | The validation and verification process and requirements at each level are described in Permit
27 | Attachment B_C3, Section B_C3-10. The validation and verification process at the Permittee
28 | DOE Level is also described in Section B_C-5.

29 | BC-4a Data Generation and Project Level Verification Requirements

30 | BC-4a(1) Data Quality Objectives

31 | The waste characterization data obtained through WAP implementation will be used to ensure
32 | that the Permittees meet regulatory requirements with regard to both regulatory compliance and
33 | to ensure that all TRU mixed wastes are properly managed during the Disposal Phase. To
34 | satisfy the RCRA regulatory compliance requirements, the following DQOs are established by
35 | this WAP:

- 36 | • Acceptable Knowledge
- 37 | - To delineate TRU mixed waste streams.
- 38 | - To assess whether TRU mixed wastes comply with the applicable requirements of
- 39 | the TSDF-WAC.

- 1 - To assess whether TRU mixed wastes exhibit a hazardous characteristic
2 (20.4.1.200 NMAC, incorporating 40 CFR §261 Subpart C).
- 3 - To assess whether TRU mixed wastes are listed (20.4.1.200 NMAC, incorporating
4 40 CFR §261, Subpart D).
- 5 - To estimate waste material parameter weights.
- 6 • Headspace-Gas Sampling and Analysis
- 7 - To identify VOCs and quantify the concentrations of VOC constituents in waste
8 containers to resolve the assignment of EPA hazardous waste numbers
- 9 • Homogeneous Waste Sampling and Analysis
- 10 - To compare UCL₉₀ values for the mean measured contaminant concentrations in a
11 waste stream with specified toxicity characteristic levels in 20.4.1.200 NMAC
12 (incorporating 40 CFR §261), to determine if the waste is hazardous, and to
13 resolve the assignment of EPA hazardous waste numbers.
- 14 • Radiography
- 15 - To determine the physical waste form, the absence of prohibited items, and
16 additional waste characterization techniques that may be used based on the
17 Summary Category Groups (i.e., S3000, S4000, S5000).
- 18 • Visual Examination
- 19 - To determine the physical waste form, the absence of prohibited items, and
20 additional waste characterization techniques that may be used based on the
21 Summary Category Groups (i.e., S3000, S4000, S5000).

22 Reconciliation of these DQOs by the Generator/Storage Site Project Manager or ~~the Permittee~~
23 ~~DOE~~ approved laboratories, as applicable, is addressed in Permit Attachment ~~B_C~~3.
24 Reconciliation requires determining whether sufficient type, quality, and quantity of data have
25 been collected to ensure the DQO's cited above can be achieved.

26 ~~BC-4a(2) Quality Assurance Objectives~~

27 The generator/storage sites or ~~the Permittee-DOE~~ approved laboratories, as applicable, shall
28 demonstrate compliance with each QAO associated with the various characterization methods
29 as presented in Permit Attachment ~~B_C~~3. Generator/Storage Site Project Managers or ~~the~~
30 ~~Permittee-DOE~~ approved laboratories, as applicable, are further required to perform a
31 reconciliation of the data with the DQOs established in this WAP. The Generator/Storage Site
32 Project Manager or ~~the Permittee-DOE~~ approved laboratories, as applicable, shall conclude that
33 all of the DQOs have been met for the characterization of the waste stream prior to submitting a
34 WSPF to ~~the Permittees-DOE~~ for approval (Permit Attachment ~~B_C~~3). The following QAO
35 elements shall be considered for each technique, as a minimum:

- 1 • Precision
- 2 – Precision is a measure of the mutual agreement among multiple measurements.
- 3 • Accuracy
- 4 – Accuracy is the degree of agreement between a measurement result and the true
5 or known value.
- 6 • Completeness
- 7 – Completeness is a measure of the amount of valid data obtained from a method
8 compared to the total amount of data obtained that is expressed as a percentage.
- 9 • Comparability
- 10 – Comparability is the degree to which one data set can be compared to another.
- 11 • Representativeness
- 12 – Representativeness expresses the degree to which data represent characteristics
13 of a population.

14 A more detailed discussion of the QAOs, including a mathematical representation, where
15 appropriate, can be found in Permit Attachment B_C3, which describes the QAOs associated
16 with each method of sampling and analysis.

17 ~~BC~~-4a(3) Sample Control

18 The generator/storage sites and ~~Permittee-DOE~~ approved laboratories, as applicable, will
19 implement a sample handling and control program that will include the maintenance of field
20 documentation records, proper labeling, and a chain of custody (**COC**) record. The
21 generator/storage site and ~~Permittee-DOE~~ approved laboratories, as applicable, Quality
22 Assurance Project Plan (**QAPjP**) or procedures referenced in the QAPjP will document this
23 program and include COC forms to control the sample from the point of origin to the final
24 analysis result reporting. ~~The Permittees-DOE~~ will review and approve the QAPjP, including
25 their determination that the sample control program is adequate. The approved QAPjP will be
26 provided to NMED prior to shipment of TRU mixed waste and before the generator/storage site
27 audit, as specified in Permit Attachment B_C5. Details of this sample control program are
28 provided in Permit Attachment B_C1 and are summarized below to include:

- 29 • Field Documentation of samples including: point of origin, date of sample, container ID,
30 sample type, analysis requested, and COC number.
- 31 • Labeling and/or tagging including: sample numbering, sample ID, sample date,
32 sampling conditions, and analysis requested.
- 33 • COC control including: name of sample relinquisher, sample receiver, and the date
34 and time of the sample transfer.

- 1 • Proper sample handling and preservation.

2 BC-4a(4) Data Generation

3 BDRs, in a format approved by ~~the Permittees DOE~~, will be used by each generator/storage site
4 and ~~Permittee DOE~~ approved laboratories, as applicable, for reporting waste characterization
5 data. This format will be included in the generator/storage site and ~~Permittee DOE~~ approved
6 laboratories, as applicable, QAPjP, controlled electronic databases, or procedures referenced in
7 the QAPjP (Permit Attachment ~~B C~~5) and will include all of the elements required by this WAP
8 for BDR (Permit Attachment ~~B C~~3).

9 ~~The Permittees DOE~~ shall perform audits of the generator/storage site waste characterization
10 programs, as implemented by the generator/storage site QAPjP, to verify compliance with the
11 WAP and the DQOs in this WAP (See Permit Attachment ~~B C~~6 for a discussion of the content of
12 the audit program). The primary functions of these audits are to review generator/storage sites'
13 adherence to the requirements of this WAP and ensure adherence to the WAP characterization
14 program. ~~The Permittees DOE~~ shall provide the results of each audit to NMED. If audit results
15 indicate that a generator/storage site is not in compliance with the requirements of this WAP,
16 ~~the Permittees DOE~~ will take appropriate action as specified in Permit Attachment ~~B C~~6.

17 ~~The Permittees DOE~~ shall perform audits of the ~~Permittee DOE~~ approved laboratory's
18 programs, as implemented by the laboratory's QAPjP (See Permit Attachment ~~B C~~6 for a
19 discussion of the content of the audit program). The primary functions of these audits are to
20 review the ~~Permittee DOE~~ approved laboratory's adherence to the requirements of this WAP.
21 ~~The Permittees DOE~~ shall provide the results of each audit to NMED. If audit results indicate
22 that a ~~Permittee DOE~~ approved laboratory is not in compliance with the requirements of this
23 WAP, ~~the Permittees DOE~~ will take appropriate action as specified in Permit Attachment ~~B C~~6.

24 ~~The Permittees DOE~~ shall further require all ~~Permittee DOE~~ approved laboratories analyzing
25 WIPP waste samples for the generator/storage sites to have established, documented QA/QC
26 programs. ~~The Permittees DOE~~ annually evaluates these laboratories and their QA/QC
27 programs as part of their participation in ~~the Permittees' DOE's~~ PDP laboratory performance
28 program. ~~The Permittees' DOE's~~ audits cover the requirements of the lab's QA/QC program, as
29 well as compliance with this WAP. Continued compliance with these parameters will be verified
30 by ongoing audits by ~~the Permittees DOE~~ at the generator/storage sites and these laboratories
31 as specified in Permit Attachment ~~B C~~6. ~~The Permittees' DOE's~~ audits of the generator/storage
32 sites will verify that the laboratories analyzing the sites' waste have been properly audited by the
33 generator/storage sites. The laboratory's QA/QC program shall include the following:

- 34 • Facility organization
35 • A list of equipment/instrumentation
36 • Operating procedures
37 • Laboratory QA/QC procedures
38 • Quality assurance review
39 • Laboratory records management

1 | BC-4a(5) Data Verification

2 | BDRs will document the testing, sampling, and analytical results from the required
3 | characterization activities, and document required QA/QC activities. Data validation and
4 | verification at both the data-generation level and the project level will be performed as required
5 | by this Permit before the required data are transmitted to ~~the Permittees-DOE~~ (Permit
6 | Attachment-B_C3). NMED may request, through ~~the Permittees DOE~~, copies of any BDR, and/or
7 | the raw data validated by the generator/storage sites, to check ~~the Permittees'-DOE's~~ audit of
8 | the validation process.

9 | BC-4a(6) Data Transmittal

10 | BDRs will include the information required by Section-B_C3-10 and will be transmitted by hard
11 | copy or electronically (provided a hard copy is available on demand) from the data generation
12 | level to the project level.

13 | The generator/storage site will transmit waste container information electronically via the WIPP
14 | Waste Information System (**WWIS**). Data will be entered into the WWIS in the exact format
15 | required by the database. Refer to Section-B_C-5a(1) for WWIS reporting requirements and the
16 | *Waste Data System User's Manual* (DOE, 2009) for the WWIS data fields and format
17 | requirements.

18 | Once a waste stream is characterized, the Site Project Manager will also submit to ~~the~~
19 | ~~Permittees-DOE~~ a WSPF (Figure-B_C-1) accompanied by the CIS for that waste stream which
20 | includes reconciliation with DQOs (Sections-B3_C-12b(1) and-B_C3-12b(2)). The WSPF, the
21 | CIS, and information from the WWIS will be used as the basis for acceptance of waste
22 | characterization information on TRU mixed wastes to be disposed of at the WIPP.

23 | BC-4a(7) Records Management

24 | Records related to waste characterization activities performed by the generator/storage sites will
25 | be maintained in the testing, sampling, or analytical facility files or generator/storage site project
26 | files, or at the WIPP Records Archive facility. ~~Permittee-DOE~~ approved laboratories will forward
27 | testing, sampling, and analytical records along with BDRs, to the generator/storage site project
28 | office for inclusion in the generator/storage site's project files and to the Permittees for inclusion
29 | in the WIPP facility operating record. Raw data obtained by testing, sampling, and analyzing
30 | TRU mixed waste in support of this WAP will be identifiable, legible, and provide documentary
31 | evidence of quality. TRU mixed waste characterization records submitted to the Permittees shall
32 | be maintained in the WIPP facility operating record and be available for inspection by NMED.

33 | Records inventory and disposition schedule (**RIDS**) or an equivalent system shall be prepared
34 | and approved by generator/storage site personnel. All records relevant to an enforcement action
35 | under this Permit, regardless of disposition, shall be maintained at the generator/storage site
36 | until NMED determines they are no longer needed for enforcement action, and then
37 | dispositioned as specified in the approved RIDS. All waste characterization data and related
38 | QA/QC records for TRU mixed waste to be shipped to the WIPP facility are designated as either
39 | Lifetime Records or Non-Permanent Records.

1 Records that are designated as Lifetime Records shall be maintained for the life of the waste
2 characterization program at a participating generator/storage site plus six years or transferred
3 for permanent archival storage to the WIPP Records Archive facility.

4 Waste characterization records designated as Non-Permanent Records shall be maintained for
5 ten years from the date of (record) generation at the participating generator/storage site or at
6 the WIPP Records Archive facility and then dispositioned according to their approved RIDs. If a
7 generator/storage site ceases to operate, all records shall be transferred before closeout to the
8 Permittees for management at the WIPP Records Archive facility. Table B_C-6 is a listing of
9 records designated as Lifetime Records and Non-Permanent Records. Classified information
10 will not be transferred to WIPP. Notations will be provided to the Permittees indicating the
11 absence of classified information. The approved generator/storage site RIDs will identify
12 appropriate disposition of classified information. Nothing in this Permit is intended to, nor should
13 it be interpreted to, require the disclosure of any U.S. Department of Energy classified
14 information to persons without appropriate clearance to view such information.

15 BC-5 Permittee-DOE Level Waste Screening and Verification of TRU Mixed Waste

16 Permittee-DOE waste screening is a two-phased process. Phase I will occur prior to configuring
17 shipments of TRU mixed waste. Phase II will occur after configuration of shipments of TRU
18 mixed waste but before it is disposed at the WIPP facility. Figure B_C-3 presents Phase I and a
19 portion of Phase II of the TRU mixed waste screening process. Permit Attachment B_C7
20 presents ~~the Permittees' DOE's~~ TRU mixed waste confirmation portion of Phase II activities.

21 BC-5a Phase I Waste Stream Screening and Verification

22 The first phase of the waste screening and verification process will occur before TRU mixed
23 waste is shipped to the WIPP facility. Before the Permittees begin the process of accepting TRU
24 mixed waste from a generator/storage site, an initial audit of that generator/storage site will be
25 conducted as part of the Permittees' DOE Audit and Surveillance Program (Permit Attachment
26 B_C6). The RCRA portion of the generator/storage site audit program will provide on-site
27 verification of characterization procedures; BDR preparation; and recordkeeping to ensure that
28 all applicable provisions of the WAP requirements are met. Another portion of the Phase I
29 verification is the WSPF approval process. At the WIPP facility, this process includes verification
30 that all of the required elements of the WSPF and the CIS are present (Permit Attachment B_C3)
31 and that the waste characterization information meet acceptance criteria required for
32 compliance with the WAP (Section B_C3-12b(1)).

33 A generator/storage site must first prepare a QAPjP, which includes applicable WAP
34 requirements, and submit it to ~~the Permittees-DOE~~ for review and approval (Permit Attachment
35 B_C5). Once approved, a copy of the QAPjP is provided to NMED for examination. The
36 generator/storage site will implement the specific parameters of the QAPjP after it is approved.
37 An initial audit will be performed after QAPjP implementation and prior to the generator/storage
38 site being certified for shipment of waste to WIPP. Additional audits, focusing on the results of
39 waste characterization, will be performed at least annually. ~~The Permittees have DOE has~~ the
40 right to conduct unannounced audits and to examine any records that are related to the scope
41 of the audit. See Section B_C-5a(3) and Permit Attachment B_C6 for further information
42 regarding audits.

1 When the required waste stream characterization data have been collected by a
2 generator/storage site and the initial generator/storage site audit has been successfully
3 completed, the generator/storage Site Project Manager will verify that waste stream
4 characterization meets the applicable WAP requirements as a part of the project level
5 verification (Section ~~B C~~3-10b). If the waste characterization does not meet the applicable
6 requirements of the WAP, the mixed waste stream cannot be managed, stored, or disposed at
7 WIPP until those requirements are met. The Site Project Manager will then complete a WSPF
8 and submit it to ~~the Permittees DOE~~, along with the accompanying CIS for that waste stream
9 (Section ~~B C~~3-12b(1)). All data necessary to check the accuracy of the WSPF will be
10 transmitted to ~~the Permittees DOE~~ for verification. This provides notification that the
11 generator/storage site considers that the waste stream (identified by the waste stream
12 identification number) has been adequately characterized for disposal prior to shipment to
13 WIPP. ~~The Permittees DOE~~ will compare headspace gas, radiographic, visual examination and
14 solid sampling/analysis data obtained subsequent to submittal and approval of the WSPF (and
15 prior to submittal) with characterization information presented on this form. If ~~the Permittees~~
16 ~~DOE~~ determines (through the data comparison) that the characterization information is
17 adequate, the WSPF will be approved. Prior to the first shipment of containers from the
18 approved waste stream, the approved WSPF and accompanying CIS will be provided to NMED.
19 If the data comparison indicates that analyzed containers have hazardous wastes not present
20 on the WSPF, or a different Waste Matrix Code applies, the WSPF is in error and shall be
21 resubmitted. Ongoing WSPF examination is discussed in detail in Section ~~B C~~-5a(2).

22 Audits of generator/storage sites will be conducted as part of the ~~Permittees' DOE~~ Audit and
23 Surveillance Program (Permit Attachment ~~B C~~6). The RCRA portion of the generator/storage
24 site audit program will provide on-site verification of waste characterization procedures; BDR
25 preparation; and record keeping to ensure that all applicable provisions of the WAP
26 requirements are met. As part of the waste characterization data submittal, the
27 generator/storage site will also transmit the data on a container basis via the WWIS. This data
28 submittal can occur at any time as the data are being collected, but will be complete for each
29 container prior to shipment of that container. The WWIS will conduct internal edit/limit checks as
30 the data are entered, and the data will be available to ~~the Permittees DOE~~ as supporting
31 information for WSPF review. NMED will have read-only access to the WWIS as necessary to
32 determine compliance with the WAP. The initial WSPF check performed by ~~the Permittees DOE~~
33 will include WWIS data submitted by the generator/storage site for each waste container and
34 the CIS. ~~The Permittees DOE~~ will compare ongoing sampling/analysis characterization data
35 obtained and submitted via the WWIS to the approved WSPF. If this comparison shows that
36 containers have hazardous wastes not reported on the WSPF, or a different Waste Matrix Code
37 applies, the data are rejected and the waste containers are not accepted for shipment until a
38 new or revised WSPF is submitted to and approved by ~~the Permittees DOE~~.

39 If discrepancies regarding hazardous waste number assignment or Waste Matrix Code
40 designation arise as a result of the Phase I review, the generator/storage sites will be contacted
41 by ~~the Permittees DOE~~ and required to provide the necessary additional information to resolve
42 the discrepancy before that waste stream is approved for disposal at the WIPP facility. If the
43 discrepancy is not resolved, the waste stream will not be approved. ~~The Permittees DOE~~ will
44 notify NMED in writing of any discrepancies identified during WSPF review and the resulting
45 discrepancy resolution prior to waste shipment. The Permittees will not manage, store, or
46 dispose the waste stream until this discrepancy is resolved in accordance with this WAP.

1 BC-5a(1) WWIS Description

2 All generator/storage sites planning to ship TRU mixed waste to WIPP will supply the required
3 data to the WWIS. The WWIS Data Dictionary includes all of the data fields, the field format and
4 the limits associated with the data as established by this WAP. These data will be subjected to
5 edit and limit checks that are performed automatically by the database, as defined in the *Waste*
6 *Data System User's Manual* (DOE, 2009).

7 ~~The Permittees-DOE~~ will coordinate the data transmission with each generator/storage site.
8 Actual data transmission will use appropriate technology to ensure the integrity of the data
9 transmissions. ~~The Permittees-DOE~~ will require sites with large waste inventories and large
10 databases to populate a data structure provided by ~~the Permittees-DOE~~ that contains the
11 required data dictionary fields that are appropriate for the waste stream (or waste streams) at
12 that site. For example, totals analysis data will not be requested from sites that do not have
13 homogeneous solids or soil/gravel waste. ~~The Permittees-DOE~~ will access these data via the
14 Internet to ensure an efficient transfer of this data. Small quantity sites will be given a similar
15 data structure by ~~the Permittees-DOE~~ that is tailored to their types of waste. Sites with very
16 small quantities of waste will be provided with the ability to assemble the data interactively to
17 this data structure on the WWIS.

18 ~~The Permittees-DOE~~ will use the WWIS to verify that all of the supplied data meet the edit and
19 limit checks prior to the shipment of any TRU mixed waste to WIPP. The WWIS automatically
20 will notify the generator/storage site if any of the supplied data fails to meet the requirements of
21 the edit and limit checks via an appropriate error message. The generator/storage site will be
22 required to correct the discrepancy with the waste or the waste data and re-transmit the
23 corrected data prior to acceptance of the data by the WWIS. ~~The Permittees-DOE~~ will review
24 data reported for each container of each shipment prior to providing notification to the shipping
25 generator/storage site that the shipment is acceptable. Read-only access to the WWIS will be
26 provided to NMED. Table ~~B C~~-7 contains a listing of the data fields contained in the WWIS that
27 are required as part of this Permit.

28 The WWIS will generate the following:

29 • Waste Emplacement Report

30 This report will be added to the operating record to track the quantities of waste, date
31 of emplacement, and location of authorized containers or container assemblies in the
32 repository. ~~The Permittees-DOE~~ will document the specific panel room or drift that an
33 individual waste container is placed in as well as the row/column/height coordinates
34 location of the container or containers assembly. This report will be generated on a
35 weekly basis. Locations of containers or container assemblies will also be placed on a
36 map separate from the WWIS. Reports and maps that are included as part of the
37 operating record will be retained at the WIPP site, for the life of the facility.

38 • Shipment Summary Report

39 This report will contain the container identification numbers (**IDs**) of every container in
40 the shipment, listed by Shipping Package number and by assembly number (for
41 seven-packs, four-packs, and three-packs), for every assembly in the Shipping

1 | Package. This report is used by ~~the Permittees-DOE~~ to verify containers in a shipment
2 | and will be generated on a shipment basis.

3 | • Waste Container Data Report

4 | This report will be generated on a waste stream basis and will be used by ~~the~~
5 | ~~Permittees-DOE~~ during the WSPF review and approval process. This report will
6 | contain the data listed in the Characterization Module on Table ~~B C~~-7. This report will
7 | be generated and attached to the WSPF for inclusion in the facility operating record
8 | and will be kept for the life of the facility.

9 | • Reports of Change Log

10 | This will consist of a short report that lists the user ID and the fields changed. The
11 | report will also include a reason for the change. A longer report will list the information
12 | provided on the short report and include a before and after image of the record for
13 | each change, a before-record for each deletion, and the new information for added
14 | records. These reports will provide an auditable trail for the data in the database.

15 | Access to the WWIS will be controlled by ~~the Permittees'-DOE's~~ Data Administrator (DA) who
16 | will control the WWIS users based on approval from management personnel.

17 | The TRU mixed waste generator/storage sites will only have access to data that they have
18 | supplied, and only until the data have been formally accepted by ~~the Permittees DOE~~. After the
19 | data have been accepted, the data will be protected from indiscriminate change and can only be
20 | changed by a authorized DA.

21 | The WWIS has a Change Log that requires a reason for the change from the DA prior to
22 | accepting the change. The data change information, the user ID of the authorized DA making
23 | the change, and the date of the change will be recorded in the data change log automatically.
24 | The data change log cannot be revised by any user, including the DA. The data change log will
25 | be subject to internal and external audits and will provide an auditable trail for all changes made
26 | to previously approved data.

27 | BC-5a(2) Examination of the Waste Stream Profile Form and Container Data Checks

28 | ~~The Permittees-DOE~~ will be responsible for the verification of completeness and accuracy of the
29 | Waste Stream Profile Form (Section ~~B C~~3-12b(1)). Figure ~~B C~~-2 includes the waste
30 | characterization and ~~Permittees'-DOE's~~ waste stream approval process. The assignment of the
31 | waste stream description, Waste Matrix Code Group, and Summary Category Groups; the
32 | results of waste analyses, as applicable; the acceptable knowledge summary documentation;
33 | the methods used for characterization; the Carlsbad Field Office (CBFO) certification, and
34 | appropriate designation of EPA hazardous waste number(s) will be examined. If the WSPF is
35 | inaccurate, efforts will be made to resolve discrepancies by contacting the generator/storage
36 | site in order for the waste stream to be eligible for shipment to the WIPP facility. If discrepancies
37 | in the waste stream are detected at the generator/storage site, the generator/storage site will
38 | implement a non-conformance program to identify, document, and report discrepancies (Permit
39 | Attachment ~~B C~~3).

1 The WSPF shall pass all verification checks by ~~the Permittees-DOE~~ in order for the waste
2 stream to be approved for shipment to the WIPP facility. The WSPF check against waste
3 container data will occur during the initial WSPF approval process (Section ~~B C~~-5a).

4 The EPA hazardous waste numbers for the wastes that appear on the Waste Stream Profile
5 Form will be compared to those in Table ~~B C~~-9 to ensure that only approved wastes are
6 accepted for management, storage, or disposal at WIPP. Some of the waste may also be
7 identified by unique state hazardous waste codes or numbers. These wastes are acceptable at
8 WIPP as long as the TSDf-WAC are met. The CIS will be reviewed by ~~the Permittees-DOE~~ to
9 verify that the waste has been classified correctly with respect to the assigned EPA hazardous
10 waste numbers. Any analytical method used will be compared to those listed in Tables ~~B C~~-2, ~~B
11 C~~-3, and ~~B C~~-4 to ensure that only approved analytical methods were used for analysis of the
12 waste. ~~The Permittees-DOE~~ will verify that the applicable requirements of the TSDf-WAC have
13 been met by the generator/storage site.

14 Waste data transferred via the WWIS after WSPF approval will be compared with the approved
15 WSPF. Any container from an approved hazardous waste stream with a description different
16 from its WSPF will not be managed, stored, or disposed at WIPP.

17 ~~The Permittees-DOE~~ will also verify that three different types of data specified below are
18 available for every container holding TRU mixed waste before that waste is managed, stored, or
19 disposed at WIPP: 1) an assignment of the waste stream's waste description (by Waste Matrix
20 Codes) and Waste Matrix Code Group; 2) a determination of ignitability, reactivity, and
21 corrosivity; and 3) a determination of compatibility. The verification of waste stream description
22 will be performed by reviewing the WWIS for consistency in the waste stream description and
23 WSPF. The CIS will indicate if the waste has been checked for the characteristics of ignitability,
24 corrosivity, and reactivity. The final verification of waste compatibility will be performed using
25 Appendix C1 of the WIPP RCRA Part B Permit Application (DOE, 1997), the compatibility study.

26 Any container with unresolved discrepancies associated with hazardous waste characterization
27 will not be managed, stored, or disposed at the WIPP facility until the discrepancies are
28 resolved. If the discrepancies cannot be resolved, ~~the Permittees-DOE~~ will revoke the approval
29 status of the waste stream, suspend shipments of the waste stream, and notify NMED. Waste
30 stream approval will not be reinstated until the generator/storage site demonstrates all
31 corrective actions have been implemented and the generator/storage site waste
32 characterization program is reassessed by ~~the Permittees-DOE~~.

33 ~~BC-5a(3) Permittees'-DOE~~ Audit and Surveillance Program

34 An important part of ~~the Permittees'-DOE's~~ verification process is the ~~Permittees'-DOE~~ Audit
35 and Surveillance Program. The focus of this audit program is compliance with this WAP and the
36 Permit. This audit program addresses all AK implementation and waste sampling and analysis
37 activities, from waste stream classification assignment through waste container certification, and
38 ensures compliance with SOPs and the WAP. Audits will ensure that containers and their
39 associated documentation are adequately tracked throughout the waste handling process.
40 Operator qualifications will be verified, and implementation of QA/QC procedures will be
41 surveyed. A final report that includes generator/storage site or ~~Permittee-DOE~~ approved
42 laboratory audit results and applicable WAP-related corrective action report (**CAR**) resolution
43 will be provided to NMED for approval, and will be kept in the WIPP facility operating record until
44 closure of the WIPP facility.

1 BC-5b(1) Examination of the EPA Uniform Hazardous Waste Manifest and Associated Waste
2 Tracking Information

3 Upon receipt of a TRU mixed waste shipment, the Permittees will make a determination of EPA
4 Uniform Hazardous Waste Manifest completeness and sign the manifest to allow the driver to
5 depart. For CH TRU mixed waste, the Permittees will then make a determination of waste
6 shipment completeness by checking the unique, bar-coded identification number found on each
7 container holding TRU mixed waste against the WWIS database after opening the Shipping
8 Package.

9 The WWIS links the bar-coded identification numbers of all containers in a specific waste
10 shipment to the waste assembly (for 7-packs, 4-packs, 3-packs and 5-drum carriages) and to
11 the shipment identification number, which is also written on the EPA Hazardous Waste
12 Manifest.

13 For shipments in the RH-TRU 72B cask, the identification number of the single payload
14 container is read during cask-to-cask transfer in the Transfer Cell and then checked against the
15 WWIS database. For shipments in the CNS 10-160B cask, the Permittees will make a
16 determination of waste shipment completeness by checking the unique identification number
17 found on each container holding TRU mixed waste in the Hot Cell against the WWIS database
18 after unloading the cask.

19 Generators electronically transmit the waste shipment information to the WWIS before the TRU
20 mixed waste shipment is transported. Once a TRU mixed waste shipment arrives, the
21 Permittees verify the identity of each cask or container (or one container in a bound 7-pack, 4-
22 pack, or 3-pack) using the data already in the WWIS.

23 The WWIS will maintain waste container receipt and emplacement information provided by the
24 Permittees. It will include, among other items, the following information associated with each
25 container of TRU mixed waste:

- 26 • Package inner containment vessel or shipping cask closure date
- 27 • Package (container or canister) receipt date
- 28 • Overpack identification number (if appropriate)
- 29 • Package (container or canister) emplacement date
- 30 • Package (container or canister) emplacement location

31 Manifest discrepancies will be identified during manifest examination and container bar-code
32 WWIS data comparison. A manifest discrepancy is a difference between the quantity or type of
33 hazardous waste designated on the manifest and the quantity or type of hazardous waste the
34 WIPP facility actually receives. The generator/storage site technical contact (as listed on the
35 manifest) will be contacted to resolve the discrepancy. If the discrepancy is identified prior to the
36 containers being removed from the package or shipping cask, the waste will be retained in the
37 parking area. If the discrepancy is identified after the waste containers are removed from the
38 package or cask, the waste will be retained in the Waste Handling Building (**WHB**) until the
39 discrepancy is resolved. Errors on the manifest can be corrected by the WIPP facility with a
40 verbal (followed by a mandatory written) concurrence by the generator/storage site technical
41 contact. All discrepancies that are unresolved within fifteen (15) days of receiving the waste will
42 be immediately reported to NMED in writing. Notifications to NMED will consist of a letter

1 describing the discrepancies, discrepancy resolution, and a copy of the manifest. If the manifest
2 discrepancies have not been resolved within thirty (30) days of waste receipt, the shipment will
3 be returned to the generator/storage facility. If it becomes necessary to return waste containers
4 to the generator/storage site, a new EPA Uniform Hazardous Waste Manifest may be prepared
5 by the Permittees.

6 Documentation of the returned containers will be recorded in the WWIS. Changes will be made
7 to the WWIS data to indicate the current status of the container(s) The reason for the WWIS
8 data change and the record of the WWIS data change will be maintained in the change log of
9 the WWIS, which will provide an auditable record of the returned shipment.

10 The Permittees will be responsible for the resolution of discrepancies, notification of NMED, as
11 well as returning the original copy of the manifest to the generator/storage site.

12 BC-5b(2) Examination of the Land Disposal Restriction (LDR) Notice

13 TRU mixed waste designated by the Secretary of Energy for disposal at WIPP is exempt from
14 the LDRs by the WIPP Land Withdrawal Act Amendment (Public Law 104-201). This
15 amendment states that WIPP "Waste is exempted from treatment standards promulgated
16 pursuant to section 3004(m) of the Solid Waste Disposal Act (42 U.S. C. 6924(m)) and shall not
17 be subjected to the Land Disposal prohibitions in section 3004(d), (e), (f), and (g) of the Solid
18 Waste Disposal Act." Therefore, with the initial shipment of a TRU mixed waste stream, the
19 generator shall provide the Permittees with a one time written notice. The notice must include
20 the information listed below:

21 Land Disposal Restriction Notice Information:

- 22 • EPA Hazardous Waste Number(s) and Manifest Numbers of first shipment of a mixed
23 waste stream
- 24 • Statement: this waste is not prohibited from land disposal
- 25 • Date the waste is subject to prohibition

26 This information is the applicable information taken from column "268.7(a)(4)" of the "Generator
27 Paperwork Requirements Table" in 20.4.1.800 NMAC (incorporating 40 CFR §268.7(a)(4)).
28 Note that item "5" from the "Generator Paperwork Requirements Table" is not applicable since
29 waste analysis data are provided electronically via the WWIS and item "7" is not applicable
30 since waste designated by the Secretary of Energy for disposal at WIPP is exempted from the
31 treatment standards.

32 The Permittees will review the LDR notice for accuracy and completeness. The generator will
33 prepare this notice in accordance with the applicable requirements of 20.4.1.800 NMAC
34 (incorporating 40 CFR §268.7(a)(4)).

35 BC-5b(3) Verification

36 The Permittees will make a determination of TRU mixed waste shipment irregularities. The
37 following items will be inspected for each TRU mixed waste shipment arriving at the WIPP
38 facility:

- 1 • Whether the number and type of containers holding TRU mixed waste match the
2 information in the WWIS
- 3 • Whether the containers are in good condition

4 The Permittees will verify that the containers (as identified by their container ID numbers) are
5 the containers for which accepted data already exists in the WWIS. A check will be performed
6 by the Permittees comparing the data on the WWIS Shipment Summary Report for the
7 shipment to the actual shipping papers (including the EPA Hazardous Waste Manifest). This
8 check also verifies that the containers included in the shipment are those for which approved
9 shipping data already exist in the WWIS Transportation Data Module (Table ~~B C~~-7). For
10 standard waste boxes (**SWBs**) and ten drum overpacks (**TDOPs**), this check will include
11 comparing the barcode on the container with the container number on the shipping papers and
12 the data on the WWIS Shipment Summary Report. For 7-pack assemblies, one of the seven
13 container barcodes will be read by the barcode reader and compared to the assembly
14 information for this container on the WWIS Shipment Summary Report. This will automatically
15 identify the remaining six containers in the assembly. This process enables the Permittees to
16 identify all of the containers in the assembly with minimum radiological exposure. If all of the
17 container IDs and the information on the shipping papers agree with the WWIS Shipment
18 Summary Report, and the shipment was subject to waste confirmation by ~~the Permittees-DOE~~
19 prior to shipment to WIPP as specified in Permit Attachment ~~B C~~7, the containers will be
20 approved for storage and disposal at the WIPP facility.

21 ~~BC~~-6 Permittees' Waste Shipment Screening QA/QC

22 Waste shipment screening QA/QC ensures that TRU mixed waste received is that which has
23 been approved for shipment during the Phase I and Phase II screening. This is accomplished by
24 maintaining QA/QC control of the waste shipment screening process. The screening process
25 will be controlled by administrative processes which will generate records documenting waste
26 receipt that will become part of the waste receipt record. The waste receipt record documents
27 that container identifications correspond to shipping information and approved TRU mixed
28 waste streams. The Permittees will extend QA/QC practices to the management of all records
29 associated with waste shipment screening determinations.

30 ~~BC~~-7 Records Management and Reporting

31 As part of the WIPP facility's operating record, data and documents associated with waste
32 characterization and waste confirmation are managed in accordance with standard records
33 management practices.

34 All waste characterization data for each TRU mixed waste container transmitted to WIPP shall
35 be maintained by the Permittees for the active life of the WIPP facility plus two years. The active
36 life of the WIPP facility is defined as the period from the initial receipt of TRU mixed waste at the
37 facility until NMED receives certification of final closure of the facility. After their active life, the
38 records shall be retired to the WIPP Records Archive facility and maintained for 30 years. These
39 records will then be offered to the National Archives. However, this disposition requirement does
40 not preclude the inclusion of these records in the permanent marker system or other
41 requirements for institutional control.

1 The storage of the Permittees' copy of the manifest, LDR information, waste characterization
2 data, WSPFs, waste confirmation activity records, and other related records will be identified on
3 the appropriate records inventory and disposition schedule.

4 The following records will be maintained for waste characterization and waste confirmation
5 purposes as part of the WIPP facility operating record:

- 6 • Completed WIPP WSPFs and accompanying CIS, including individual container data
7 as transferred on the WWIS (or received as hard-copy) and any discrepancy-related
8 documentation as specified in Section B.C-5a
- 9 • Radiography and visual examination records (data sheets, packaging logs, and video
10 and audio recordings) of waste confirmation activities
- 11 • Completed Waste Receipt Checklists and discrepancy-related documentation as
12 specified in Section B.C-5b
- 13 • WIPP WWIS Waste Emplacement Report as specified in Section B.C-5a(1)
- 14 • Audit reports and corrective action reports from the Permittees' DOE Audit and
15 Surveillance Program audits as specified in Section B.C-5a(3) and Permit Attachment
16 B.C6
- 17 • CARs and closure information for corrective actions taken due to nonconforming waste
18 being identified during waste confirmation by the Permittees DOE

19 These records will be maintained for all TRU mixed waste managed at the WIPP facility.

20 Waste characterization and waste confirmation data and documents related to waste
21 characterization that are part of the WIPP facility operating record are managed in accordance
22 with the following guidelines:

23 B.C-7a General Requirements

- 24 • Records shall be legible
- 25 • Corrections shall be made with a single line through the incorrect information, and the
26 date and initial of the person making the correction shall be added
- 27 • Black ink is encouraged, unless a copy test has been conducted to ensure the other
28 color ink will copy
- 29 • Use of highlighters on records is discouraged
- 30 • Records shall be reviewed for completeness
- 31 • Records shall be validated by the cognizant manager or designee

1 BC-7b Records Storage

- 2
- Active records shall be stored when not in use
- 3
- Quality records shall be kept in a one-hour (certified) fire-rated container or a copy of a
- 4 record shall be stored separately (sufficiently remote from the original) in order to
- 5 prevent destruction of both copies as a result of a single event such as fire or natural
- 6 disaster
- 7
- Unauthorized access to the records is controlled by locking the storage container or
- 8 controlling personnel access to the storage area

9 BC-8 Reporting

10 The Permittees will provide a biennial report in accordance with 20.4.1.500 NMAC

11 (incorporating 40 CFR §264.75) to NMED that includes information on actual volume and waste

12 descriptions received for disposal during the time period covered by the report.

1 | BC-9 List of References

- 2 | U.S. Department of Energy (DOE), 2009, "Waste Data System User's Manual", DOE/WIPP 09-
3 | 3427, U.S. Department of Energy.
- 4 | U.S. Department of Energy (DOE), 1997, Resource Conservation and Recovery Act Part B
5 | Permit Application for the Waste Isolation Pilot Plant", Revision 6.5, U.S. Department of Energy.
- 6 | U.S. Department of Energy (DOE), 2003, "Performance Demonstration Program Plan for the
7 | Analysis of Simulated Headspace Gases for the TRU Waste Characterization Program," CAO-
8 | 95-1076, Current Revision, Carlsbad, New Mexico, Carlsbad Field Office, U.S. Department of
9 | Energy.
- 10 | U.S. Department of Energy (DOE), 2005, "Performance Demonstration Program Plans for
11 | Analysis of Solid Waste Forms," CAO-95-1077, Current Revision, Carlsbad, New Mexico,
12 | Carlsbad Field Office, U.S. Department of Energy.
- 13 | U.S. Environmental Protection Agency (EPA), April 1994, "Waste Analysis at Facilities that
14 | Generate, Treat, Store, and Dispose of Hazardous Waste, a Guidance Manual," OSWER
15 | 9938.4-03, Office of Solid Waste and Emergency Response, Washington, D.C.
- 16 | U.S. Environmental Protection Agency (EPA), April 1980. "A Method for Determining the
17 | Compatibility of Hazardous Wastes," EPA-600/2-80-076, California Department of Health
18 | Services and the U.S. Environmental Protection Agency, Office of Research and Development.
- 19 | U.S. Environmental Protection Agency (EPA), 1996. "Test Methods for Evaluating Solid Waste,"
20 | Laboratory Manual Physical/Chemical Methods, SW-846, 3rd ed., U.S. Environmental
21 | Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

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TABLES

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1 | **Table B.C-1**
 2 | **Summary of Hazardous Waste Characterization Requirements for Transuranic Mixed Waste^a**

Parameter	Techniques and Procedure																																								
<p><u>Physical Waste Form</u></p> <p><u>Summary</u></p> <table border="0"> <tr> <td><u>Category</u></td> <td><u>Names</u></td> </tr> <tr> <td>S3000</td> <td>Homogeneous Solid</td> </tr> <tr> <td>S4000</td> <td>Soil/Gravel</td> </tr> <tr> <td>S5000</td> <td>Debris Wastes</td> </tr> </table>	<u>Category</u>	<u>Names</u>	S3000	Homogeneous Solid	S4000	Soil/Gravel	S5000	Debris Wastes	<p><u>Waste Inspection Procedures</u></p> <p>Radiography Visual Examination (Permit Attachment-B.C1-3)</p>																																
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<p><u>Headspace Gases</u></p> <p><u>Volatile Organic Compounds</u></p> <table border="0"> <tr> <td>Benzene</td> <td><u>Alcohols and Ketones</u></td> </tr> <tr> <td>Bromoform</td> <td>Acetone</td> </tr> <tr> <td>Carbon tetrachloride</td> <td>Butanol</td> </tr> <tr> <td>Chlorobenzene</td> <td>Methanol</td> </tr> <tr> <td>Chloroform</td> <td>Methyl ethyl ketone</td> </tr> <tr> <td>1,1-Dichloroethane</td> <td>Methyl isobutyl ketone</td> </tr> <tr> <td>1,2-Dichloroethane</td> <td></td> </tr> <tr> <td>1,1-Dichloroethylene</td> <td></td> </tr> <tr> <td>(cis)-1,2-Dichloroethylene</td> <td></td> </tr> <tr> <td>(trans)-1,2-Dichloroethylene</td> <td></td> </tr> <tr> <td>Ethyl benzene</td> <td></td> </tr> <tr> <td>Ethyl ether</td> <td></td> </tr> <tr> <td>Methylene chloride</td> <td></td> </tr> <tr> <td>1,1,2,2-Tetrachloroethane</td> <td></td> </tr> <tr> <td>Tetrachloroethylene</td> <td></td> </tr> <tr> <td>Toluene</td> <td></td> </tr> <tr> <td>1,1,1-Trichloroethane</td> <td></td> </tr> <tr> <td>Trichloroethylene</td> <td></td> </tr> <tr> <td>1,1,2-Trichloro-1,2,2-trifluoroethane</td> <td></td> </tr> <tr> <td>Xylenes</td> <td></td> </tr> </table>	Benzene	<u>Alcohols and Ketones</u>	Bromoform	Acetone	Carbon tetrachloride	Butanol	Chlorobenzene	Methanol	Chloroform	Methyl ethyl ketone	1,1-Dichloroethane	Methyl isobutyl ketone	1,2-Dichloroethane		1,1-Dichloroethylene		(cis)-1,2-Dichloroethylene		(trans)-1,2-Dichloroethylene		Ethyl benzene		Ethyl ether		Methylene chloride		1,1,2,2-Tetrachloroethane		Tetrachloroethylene		Toluene		1,1,1-Trichloroethane		Trichloroethylene		1,1,2-Trichloro-1,2,2-trifluoroethane		Xylenes		<p><u>Gas Analysis^f</u></p> <p>Gas Chromatography /Mass Spectroscopy (GC/MS), EPA TO-14A or TO-15, or modified SW-846 8260 (Permit Attachment-B.C3)</p> <p>GC/Flame Ionization Detector (FID), for alcohols and ketones, SW-846 8015 (Permit Attachment-B.C3)</p> <p>Fourier Transform Infrared Spectroscopy (FTIRS), SW-846</p>
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Table B C-1
Summary of Hazardous Waste Characterization Requirements for Transuranic Mixed Waste ^a

Parameter	Techniques and Procedure														
<p><u>Total Semivolatile Organic Compounds</u></p> <p>Cresols 1,4-Dichlorobenzene^e 1,2-Dichlorobenzene^e 2,4-Dinitrophenol 2,4-Dinitrotoluene Hexachlorobenzene Hexachloroethane Nitrobenzene Pentachlorophenol Pyridine^e</p>	<p><u>Total Semivolatile Organic Compound Analysis ^g</u></p> <p>TCLP, SW-846 1311</p> <p>GC/MS, SW-846 8270 (Permit Attachment-B C3)</p> <p>Acceptable Knowledge for Summary Category S5000 (Debris Wastes)</p>														
<p><u>Total Metals</u></p> <table border="0"> <tr> <td>Antimony</td> <td>Mercury</td> </tr> <tr> <td>Arsenic</td> <td>Nickel</td> </tr> <tr> <td>Barium</td> <td>Selenium</td> </tr> <tr> <td>Beryllium</td> <td>Silver</td> </tr> <tr> <td>Cadmium</td> <td>Thallium</td> </tr> <tr> <td>Chromium</td> <td>Vanadium</td> </tr> <tr> <td>Lead</td> <td>Zinc</td> </tr> </table>	Antimony	Mercury	Arsenic	Nickel	Barium	Selenium	Beryllium	Silver	Cadmium	Thallium	Chromium	Vanadium	Lead	Zinc	<p><u>Total Metals Analysis ^g</u></p> <p>TCLP, SW-846 1311</p> <p>ICP- MS, SW-846 6020 , ICP Emission Spectroscopy, SW-846 6010 Atomic Absorption Spectroscopy , SW-846 7000 (Permit Attachment-B C3)</p> <p>Acceptable Knowledge for Summary Category S5000 (Debris Wastes)</p>
Antimony	Mercury														
Arsenic	Nickel														
Barium	Selenium														
Beryllium	Silver														
Cadmium	Thallium														
Chromium	Vanadium														
Lead	Zinc														

- ^a Permit Attachment-B C
- ^b Required only for homogeneous solids and soil/gravel waste from Savannah River Site to resolve the assignment of EPA hazardous waste numbers.
- ^c Required only for homogeneous solids and soil/gravel waste from Oak Ridge National Laboratory and Savannah River Site to resolve the assignment of EPA hazardous waste numbers.
- ^d Can also be analyzed as a semi-volatile organic compound.
- ^e Can also be analyzed as a volatile organic compound.
- ^f Required only to resolve the assignment of EPA hazardous waste numbers to debris waste streams.
- ^g Required only to resolve the assignment of EPA hazardous waste numbers to homogeneous solid and soil/gravel waste streams.

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Table B C-2
Headspace Target Analyte List and Methods ^b

Parameter	EPA Specified Analytical Method
Benzene Bromoform Carbon tetrachloride Chlorobenzene Chloroform 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethylene (cis)-1,2-Dichloroethylene (trans)-1,2-Dichloroethylene Ethyl benzene Ethyl ether Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethylene Toluene 1,1,1-Trichloroethane Trichloroethylene 1,1,2-Trichloro-1,2,2-trifluoroethane Xylenes	EPA: Modified TO-14A, TO-15 ^a ; Modified 8260 EPA – Approved FTIRS
Acetone Butanol Methanol Methyl ethyl ketone Methyl isobutyl ketone	EPA: Modified TO-14 A, TO-15 ^a ; Modified 8260 Method 8015 EPA - Approved FTIRS

^a U.S. Environmental Protection Agency (EPA), 1999, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air – Second Edition (EPA/625/R-96/010b). The most current revision of the specified methods may be used.

^b Required only for debris waste when required to resolve the assignment of EPA hazardous waste numbers.

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Table B C-3
Required Organic Analyses and Test Methods Organized by Organic Analytical Groups^e

Organic Analytical Group	Required Organic Analyses	EPA Specified Analytical Method ^{a,d}
Nonhalogenated Volatile Organic Compounds (VOCs)	Acetone Benzene n-Butanol Carbon disulfide Ethyl benzene Ethyl ether Formaldehyde Hydrazine ^b Isobutanol Methanol Methyl ethyl ketone Toluene Xylenes	8015 8260 8315A
Halogenated VOCs	Bromoform Carbon tetrachloride Chlorobenzene Chloroform 1,2-Dichloroethane 1,1-Dichloroethylene (trans)-1,2-Dichloroethylene Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethylene 1,1,2-Trichloroethane 1,1,1-Trichloroethane Trichloroethylene Trichlorofluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane Vinyl Chloride	8015 8260
Semivolatile Organic Compounds (SVOCs)	Cresols (o, m, p) 1,2-Dichlorobenzene ^c 1,4-Dichlorobenzene ^c 2,4-Dinitrophenol 2,4-Dinitrotoluene Hexachlorobenzene Hexachloroethane Nitrobenzene Pentachlorophenol Pyridine ^c	8270

^a U.S. Environmental Protection Agency (EPA), 1996, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Third Edition.

^b Generator/Storage Sites will have to develop an analytical method for hydrazine. This method will be submitted to ~~the Permittees-DOE~~ for approval.

^c These compounds may also be analyzed as VOCs by SW-846 Method 8260.

^d TCLP (SW-846 1311) may be used to determine if compounds in 20.4.1.200 NMAC (incorporating 40 CFR §261, Subpart C) exhibit a toxicity characteristic.

^e Required only to resolve the assignment of EPA hazardous waste numbers.

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Table B.C-4
Summary of Sample Preparation and Analytical Methods for Metals

Parameters	EPA-Specified Analytical Methods^{a,b,c}
Sample Preparation	3051, or equivalent, as appropriate for analytical method
Total Antimony	6010, 6020, 7000, 7010, 7062
Total Arsenic	6010, 6020, 7010, 7061, 7062
Total Barium	6010, 6020, 7000, 7010
Total Beryllium	6010, 6020, 7000, 7010
Total Cadmium	6010, 6020, 7000, 7010
Total Chromium	6010, 6020, 7000, 7010
Total Lead	6010, 6020, 7000, 7010
Total Mercury	7471
Total Nickel	6010, 6020, 7000, 7010
Total Selenium	6010, 7010, 7741, 7742
Total Silver	6010, 6020, 7000, 7010
Total Thallium	6010, 6020, 7000, 7010
Total Vanadium	6010, 7000, 7010
Total Zinc	6010, 6020, 7000, 7010

- ^a U.S. Environmental Protection Agency (EPA), 1996. "Test Methods for Evaluating Solid Waste," Laboratory Manual Physical/Chemical Methods, SW-846, 3rd ed., U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.
- ^b TCLP (SW-846 1311) may be used to determine if compounds in 20.4.1.200 NMAC (incorporating 40 CFR §261, Subpart C) exhibit a toxicity characteristic.
- ^c Required only for homogeneous solids and soil/gravel to resolve the assignment of EPA hazardous waste numbers.

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Table B C-5
Summary of Parameters, Characterization Methods, and Rationale for Transuranic Mixed Waste

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
Stored Waste				
S3000-Homogeneous Solids	<ul style="list-style-type: none"> • Solidified inorganics • Salt waste • Solidified organics 	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	<ul style="list-style-type: none"> • Determine waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no liquid in excess of TSDF-WAC limits, no incompatible wastes, no compressed gases)
S4000-Soil/Gravel	<ul style="list-style-type: none"> • Contaminated soil/debris 	Hazardous constituents <ul style="list-style-type: none"> • Listed • Characteristic 	Acceptable knowledge or statistical sampling ^a (see Tables B C-3 and B C-4)	<ul style="list-style-type: none"> • Determine characteristic metals and organics • Resolve the assignment of EPA hazardous waste numbers
S5000-Debris Waste	<ul style="list-style-type: none"> • Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous debris waste • Composite filter waste 	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	<ul style="list-style-type: none"> • Determine waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no liquid in excess of TSDF-WAC limits, no incompatible wastes, no compressed gases)
		Hazardous constituents <ul style="list-style-type: none"> • Characteristic • Listed 	Statistical gas sampling and analysis ^a (see Table B C-2)	<ul style="list-style-type: none"> • Resolve the assignment of EPA hazardous waste numbers
		Hazardous constituents <ul style="list-style-type: none"> • Characteristic 	Acceptable knowledge	<ul style="list-style-type: none"> • Determine characteristic metals and organics

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**Table B C-5
 Summary of Parameters, Characterization Methods, and Rationale for Transuranic Mixed Waste (Continued)**

Waste Matrix Code Summary Categories	Waste Matrix Code Groups	Characterization Parameter	Method	Rationale
Newly Generated Waste				
S3000-Homogeneous Solids	<ul style="list-style-type: none"> • Solidified inorganics • Salt waste • Solidified organics 	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	<ul style="list-style-type: none"> • Determine waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no liquid in excess of TSDF-WAC limits, no incompatible wastes, no compressed gases)
		Hazardous constituents <ul style="list-style-type: none"> • Listed • Characteristic 	Statistical sampling ^a (see Tables B C-3 and B C-4)	<ul style="list-style-type: none"> • Determine characteristic metals and organics • Resolve the assignment of EPA hazardous waste numbers
S4000-Soil/Gravel	<ul style="list-style-type: none"> • Contaminated soil/debris 	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	<ul style="list-style-type: none"> • Determine waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no liquid in excess of TSDF-WAC limits, no incompatible wastes, no compressed gases)
		Hazardous constituents <ul style="list-style-type: none"> • Characteristic • Listed 	Statistical gas sampling and analysis ^a (see Table B C-2)	<ul style="list-style-type: none"> • Resolve the assignment of EPA hazardous waste numbers
		Hazardous constituents <ul style="list-style-type: none"> • Characteristic 	Acceptable knowledge	<ul style="list-style-type: none"> • Determine characteristic metals and organics
S5000-Debris Waste	<ul style="list-style-type: none"> • Uncategorized metal (metal waste other than lead/cadmium) • Lead/cadmium waste • Inorganic nonmetal waste • Combustible waste • Graphite waste • Heterogeneous debris waste • Composite filter waste 	Physical waste form	Acceptable knowledge, radiography, and/or visual examination	<ul style="list-style-type: none"> • Determine waste matrix • Demonstrate compliance with waste acceptance criteria (e.g., no liquid in excess of TSDF-WAC limits, no incompatible wastes, no compressed gases)
		Hazardous constituents <ul style="list-style-type: none"> • Characteristic • Listed 	Statistical gas sampling and analysis ^a (see Table B C-2)	<ul style="list-style-type: none"> • Resolve the assignment of EPA hazardous waste numbers
		Hazardous constituents <ul style="list-style-type: none"> • Characteristic 	Acceptable knowledge	<ul style="list-style-type: none"> • Determine characteristic metals and organics

^a Applies to waste streams that require sampling.

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Table B C-6
Required Program Records Maintained in Generator/Storage Site Project Files

<p><u>Lifetime Records</u></p> <ul style="list-style-type: none">• Field sampling data forms• Field and laboratory chain-of-custody forms• Test facility and laboratory batch data reports• Waste Stream Characterization Package• Sampling Plans• Data reduction, validation, and reporting documentation• Acceptable knowledge documentation• Waste Stream Profile Form and Characterization Information Summary
<p><u>Non-Permanent Records</u></p> <ul style="list-style-type: none">• Nonconformance documentation• Variance documentation• Assessment documentation• Gas canister tags• Methods performance documentation• Performance Demonstration Program documentation• Sampling equipment certifications• Calculations and related software documentation• Training/qualification documentation• QAPjPs (generator/storage sites) documentation (all revisions)• Calibration documentation• Analytical raw data• Procurement documentation• QA procedures (all revisions)• Technical implementing procedures (all revisions)• Audio/video recording (radiography, visual, etc.)

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Table B.C-7
WIPP Waste Information System Data Fields^a

Characterization Module Data Fields ^b	
Container ID ^c Generator EPA ID Generator Address Generator Name Generator Contact Hazardous Code Headspace Gas Sample Date Headspace Gas Analysis Date Layers of Packaging Liner Exists Liner Hole Size Filter Model Number of Filters Installed Headspace Gas Analyte ^d Headspace Gas Concentration ^d Headspace Gas Char. Method ^d Total VOC Char. Method ^d Total Metals Char. Method ^d Total Semi-VOC Char. Method ^d Item Description Code Haz. Manifest Number NDE Complete ^e	Total VOC Sample Date Total VOC Analysis Date Total VOC Analyte Name ^d Total VOC Analyte Concentration ^d Total Metal Sample Date Total Metal Analysis Date Total Metal Analyte Name ^d Total Metal Analyte Concentration ^d Semi-VOC Sample Date Semi-VOC Analysis Date Semi-VOC Analyte Name ^d Semi-VOC Concentration ^d Transporter EPA ID Transporter Name Visual Exam Container ^e Waste Material Parameter ^d Waste Material Weight ^d Waste Matrix Code Waste Matrix Code Group Waste Stream Profile Number
Certification Module Data Fields	
Container ID ^c Container type Container Weight Contact Dose Rate Container Certification date Container Closure Date	Handling Code
Transportation Data Module	
Contact Handled Package Number Assembly Number ^f Container IDs ^{c,d} ICV Closure Date	Ship Date Receive Date
Disposal Module Data	
Container ID ^c Disposal Date Disposal Location	

^a This is not a complete list of the WWIS data fields.

^b Some of the fields required for characterization are also required for certification and/or transportation.

^c Container ID is the main relational field in the WWIS Database.

^d This is a multiple occurring field for each analyte, nuclide, etc.

^e These are logical fields requiring only a yes/no.

^f Required for 7-packs of 55-gal drums, 4-packs of 85-gal drums, or 3-packs of 100-gal drums to tie all of the drums in that assembly together. This facilitates the identification of waste containers in a shipment without need to breakup the assembly.

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Table B.C-8
Waste Tanks Subject to Exclusion

Hanford Site - 177 Tanks	
A-101 through A-106	C-201 through C-204
AN-101 through AN-107	S-101 through S-112
AP-101 through AP-108	SX-101 through SX-115
AW-101 through AW-106	SY-101 through SY-103
AX-101 through AX-104	T-101 through T-112
AY-101 through AY-102	T-201 through T-204
B-101 through B-112	TX-101 through TX-118
B-201 through B-204	TY-101 through TY-106
BX-101 through BX-112	U-101 through U-112
BY-101 through BY-112	U-201 through U-204
C-101 through C-112	
Savannah River Site - 51 Tanks	
Tank 1 through 51	
Idaho National Engineering and Environmental Laboratory - 15 Tanks	
WM-103 through WM-106	WM-180 through 190

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Table B C-9
Listing of Permitted Hazardous Waste Numbers

EPA Hazardous Waste Numbers			
F001	D019	D043	U079
F002	D021	P015	U103
F003	D022	P030	U105
F004	D026	P098	U108
F005	D027	P099	U122
F006	D028	P106	U133*
F007	D029	P120	U134*
F009	D030	U002*	U151
D004	D032	U003*	U154*
D005	D033	U019*	U159*
D006	D034	U037	U196
D007	D035	U043	U209
D008	D036	U044	U210
D009	D037	U052	U220
D010	D038	U070	U226
D011	D039	U072	U228
D018	D040	U078	U239*

* Acceptance of U-numbered wastes listed for reactivity, ignitability, or corrosivity characteristics is contingent upon a demonstration that the wastes no longer exhibit the characteristic of reactivity, ignitability, or corrosivity.

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FIGURES

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WASTE STREAM PROFILE FORM

Waste Stream Profile Number: _____
Generator Site Name: _____ Technical Contract: _____
Generator Site EPA ID: _____ Technical Contact Phone Number: _____
Date of audit report approval by NMED: _____
Title, version number and date of documents used for WAP Certification: _____

Did your facility generate this waste? Yes No
If no, provide the name and EPA ID of the original generator: _____

WIPP ID: _____ Summary Category Group: _____
Waste Stream Name: _____
Description from the WTWBIR: _____

Defense Waste: Yes No Check one: CH RH
Number of SWBs _____ Number of Drums _____ Number of Canisters _____
Batch Data Report numbers supporting this waste stream characterization: _____
List applicable EPA Hazardous Waste Numbers ⁽²⁾ _____
Applicable TRUCON Content Numbers: _____

Acceptable Knowledge Information⁽¹⁾
(For the following, enter supporting documentation used (i.e., references and dates))

Required Program Information

- Map of site: _____
- Facility mission description: _____
- Description of operations that generate waste: _____

- Waste identification/categorization schemes: _____
- Types and quantities of waste generated: _____
- Correlation of waste streams generated from the same building and process, as applicable: _____

- Waste certification procedures: _____

Required Waste Stream Information

- Area(s) and building(s) from which waste stream was generated: _____
- Waste stream volume and time period of generation: _____
- Waste generating process description for each building: _____
- Waste process flow diagrams: _____

- Material inputs or other information identifying chemical/radionuclide content and physical waste form: _____

- Waste material parameter estimates per unit of waste: _____
- Which Defense Activity generated the waste: (check one)
 - Weapons activities including defense inertial confinement fusion
 - Naval reactors development
 - Verification and control technology
 - Defense research and development
 - Defense nuclear waste and material by products management
 - Defense nuclear material production
 - Defense nuclear waste and materials security and safeguards and security investigations

Figure B.C-1
WIPP Waste Stream Profile Form (Example Only)

WASTE STREAM PROFILE FORM

Supplemental Documentation

Process design documents: _____
Standard operating procedures: _____
Safety Analysis Reports: _____
Waste packaging logs: _____
Test plans/research project reports: _____
Site data bases: _____
Information from site personnel: _____
Standard industry documents: _____
Previous analytical data: _____
Material safety data sheets: _____
Sampling and analysis data from comparable/surrogate waste: _____
Laboratory notebooks: _____

Confirmation Information⁽²⁾

[For the following, when applicable, enter procedure title(s), number(s), and date(s)]

Radiography: _____
Visual Examination: _____

Waste Stream Profile Form Certification

I hereby certify that I have reviewed the information in this Waste Stream Profile Form, and it is complete and accurate to the best of my knowledge. I understand that this information will be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature of Site Project Manager

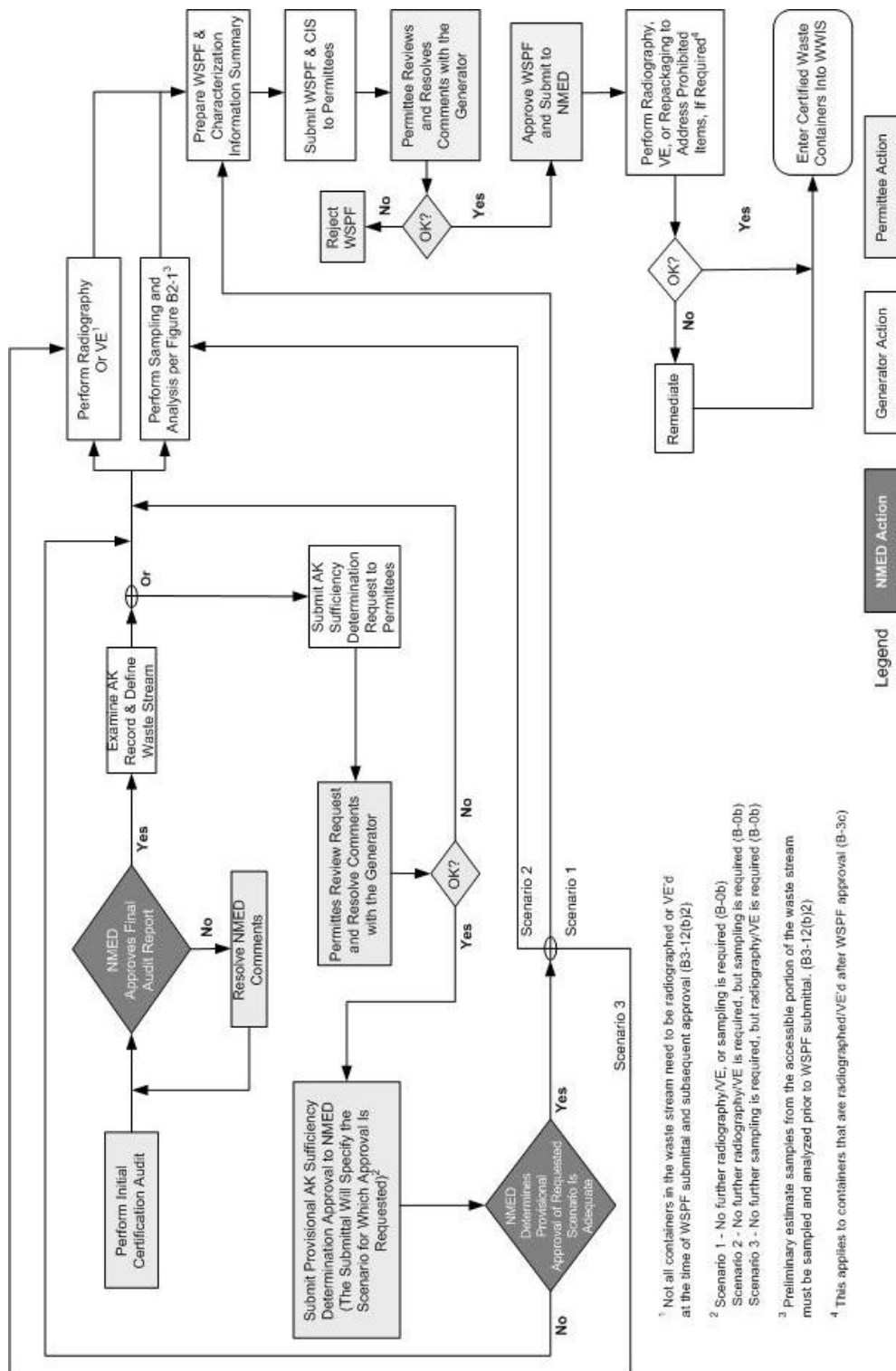
Printed Name and Title

Date

NOTE:

- (1) Use back of sheet or continuation sheets, if required.
- (2) If, radiography, visual examination were used to confirm EPA Hazardous Waste Numbers, attach signed Characterization Information Summary documenting this determination.

Figure B.C-1
WIPP Waste Stream Profile Form (Example Only – Continued)



¹ Not all containers in the waste stream need to be radiographed or VE'd at the time of WSPF submittal and subsequent approval (B3-12(b)2)

² Scenario 1 - No further radiography/VE, or sampling is required (B-0b)
 Scenario 2 - No further radiography/VE is required, but sampling is required (B-0b)
 Scenario 3 - No further sampling is required, but radiography/VE is required (B-0b)

³ Preliminary estimate samples from the accessible portion of the waste stream must be sampled and analyzed prior to WSPF submittal. (B3-12(b)2)

⁴ This applies to containers that are radiographed/VE'd after WSPF approval (B-3c)

Figure B.C-2
Waste Characterization Process

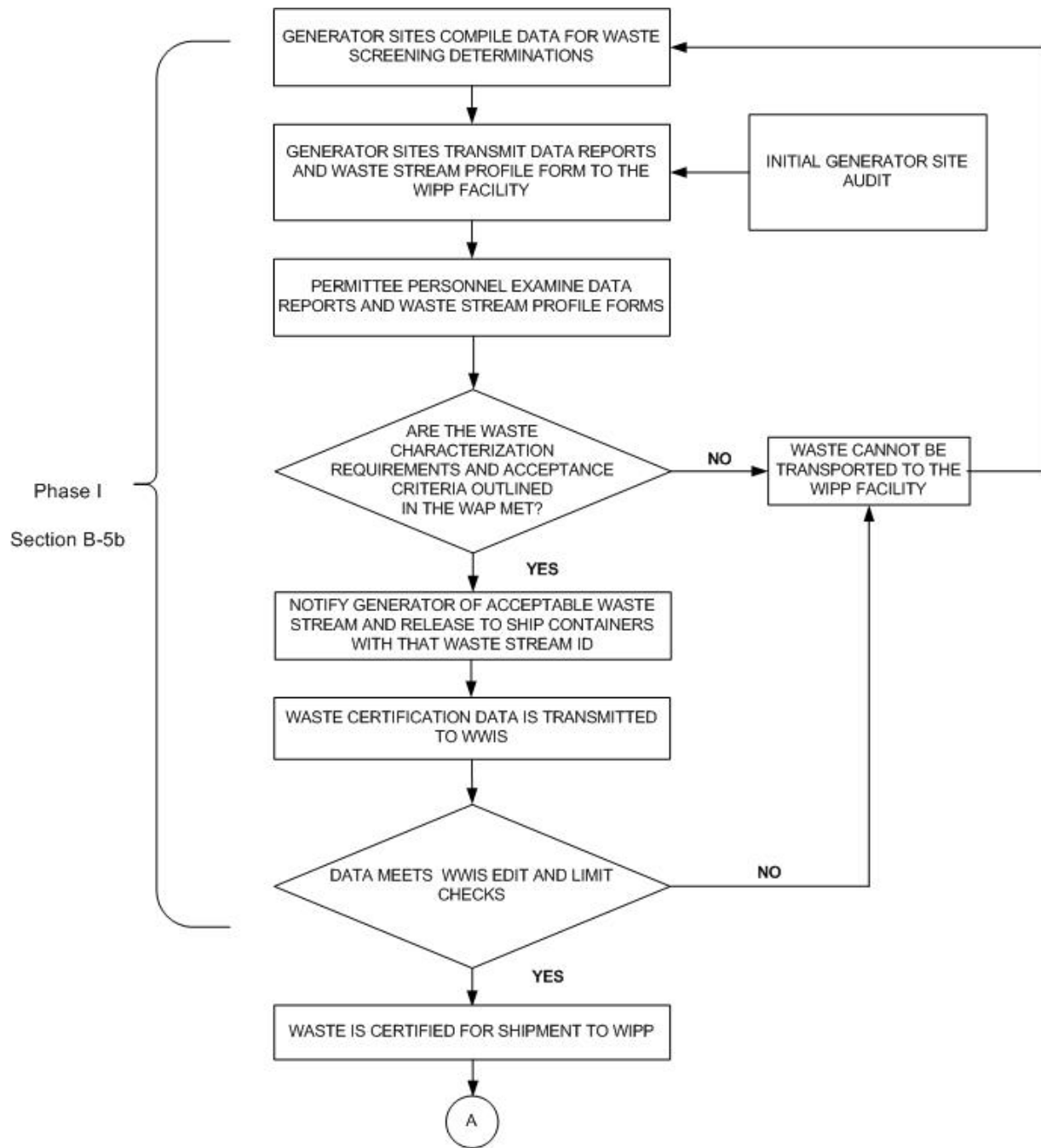


Figure B.C-3
TRU Mixed Waste Screening and Verification

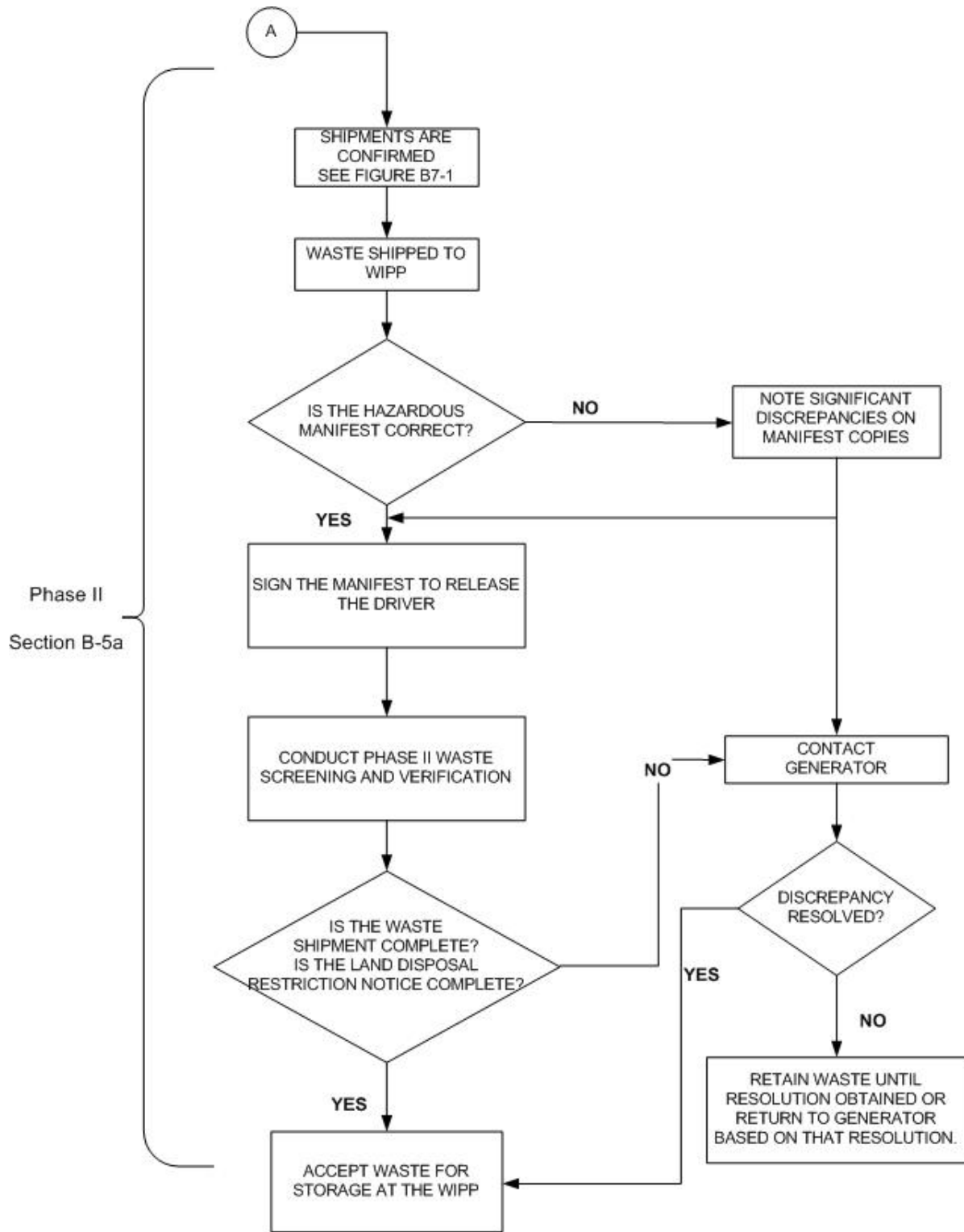


Figure B.C-3
TRU Mixed Waste Screening and Verification (Continued)