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ADDENDUM B
WASTE ANALYSIS PLAN

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**ADDENDUM B:
WASTE ANALYSIS PLAN**

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ACRONYMS

1		
2	ALARA	as low as reasonably achievable
3	AOAC	Association of Official Analytical Chemists
4	APHA	American Public Health Association
5	ASNT	American Society for Nondestructive Testing
6	ASTM	American Society for Testing and Materials
7	CAP	corrective action plan
8	CCW	constituent concentrations in waste
9	CCWE	constituent concentrations in waste extract
10	COLIWASA	composite liquid waste sampler
11	CFR	Code of Federal Regulations
12	CWC	Central Waste Complex
13	DOE-RL	U.S. Department of Energy, Richland Operations Office
14	DQO	data quality objectives
15	Ecology	Washington State Department of Ecology
16	EPA	U.S. Environmental Protection Agency
17	HNF	Hanford Nuclear Facility (document identifier)
18	LDR	land disposal restriction
19	LLBG	Low-Level Burial Grounds Trenches 31 and 34
20	MSDS	material safety data sheet
21	NDA	nondestructive assay
22	NDE	nondestructive examination
23	NIOSH	National Institute for Occupational Safety and Health
24	PCB	polychlorinated biphenyl
25	PES	performance evaluation system
26	pH	negative logarithm of the hydrogen-ion concentration
27	PPE	personal protective equipment
28	QA	quality assurance
29	QC	quality control
30	RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
31	RCW	Revised Code of Washington
32	SAP	sampling and analysis plan
33	SEPA	State Environmental Policy Act
34	SWOC	Solid Waste Operations Complex
35	T Plant	T Plant Complex
36	TCLP	toxicity characteristic leaching procedure
37	TPA or Tri-Party Agreement	<i>Hanford Federal Facility Agreement and Consent Order</i>
38	TSCA	<i>Toxic Substances Control Act of 1976</i>
39	TSD	treatment, storage, and/or disposal
40	UHC	underlying hazardous constituents
41	WAC	Washington Administrative Code
42	WAP	waste analysis plan

1 WRAP

Waste Receiving and Processing Facility

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METRIC CONVERSION CHART

Into metric units

Out of metric units

If you know	Multiply by	To get	If you know	Multiply by	To get
Length			Length		
inches	25.40	millimeters	millimeters	0.03937	inches
inches	2.54	centimeters	centimeters	0.393701	inches
feet	0.3048	meters	Meters	3.28084	feet
yards	0.9144	meters	Meters	1.0936	yards
miles (statute)	1.60934	kilometers	kilometers	0.62137	miles (statute)
Area			Area		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.09290304	square meters	square meters	10.7639	square feet
square yards	0.8361274	square meters	square meters	1.19599	square yards
square miles	2.59	square kilometers	square kilometers	0.386102	square miles
acres	0.404687	hectares	hectares	2.47104	acres
Mass (weight)			Mass (weight)		
ounces (avoir)	28.34952	grams	Grams	0.035274	ounces (avoir)
pounds	0.45359237	kilograms	kilograms	2.204623	pounds (avoir)
tons (short)	0.9071847	tons (metric)	tons (metric)	1.1023	tons (short)
Volume			Volume		
ounces (U.S., liquid)	29.57353	milliliters	milliliters	0.033814	ounces (U.S., liquid)
quarts (U.S., liquid)	0.9463529	liters	Liters	1.0567	quarts (U.S., liquid)
gallons (U.S., liquid)	3.7854	liters	Liters	0.26417	gallons (U.S., liquid)
cubic feet	0.02831685	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.7645549	cubic meters	cubic meters	1.308	cubic yards
Temperature			Temperature		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit
Energy			Energy		
kilowatt hour	3,412	British thermal unit	British thermal unit	0.000293	kilowatt hour
kilowatt	0.94782	British thermal unit per second	British thermal unit per second	1.055	kilowatt
Force/Pressure			Force/Pressure		
pounds (force) per square inch	6.894757	Kilopascals	kilopascals	0.14504	pounds per square inch

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Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Third Ed., 1990, Professional Publications, Inc., Belmont, California.

DEFINITIONS

Term	Definition
Analysis	Obtaining and reviewing information provided by the waste generator and/or provided by other means to confirm the information provided concerning a waste stream.
Compatible	As applied to suitability of containers, tanks or sampling equipment, <i>compatible</i> means the waste will not react with or otherwise damage the container, tank, or sampling equipment so that the ability of the equipment to contain the waste is not impaired. For determination of compatibility for storage, refer to definition of <i>incompatible waste</i> .
Database	The solid waste information tracking system. A database containing profile, confirmation, storage, transfer and shipment information on each container of waste.
Inspection	Viewing of the contents of the container, container markings and labeling, number of containers, and/or the container itself as a means of confirming the identity of the waste
Knowledge	Sufficient information about a waste to substitute reliably for direct testing of the waste. To be sufficient and reliable, the <i>knowledge</i> used must provide information necessary to manage the waste in accordance with the requirements of this chapter. [WAC 173-303-040] Note: <i>Knowledge</i> may be used by itself or in combination with testing to designate as waste pursuant to WAC 173-303-070(3)(c), or to obtain a detailed chemical, physical, and/or biological analysis of a waste as required in WAC 173-303-300(2).
Profile	A <i>detailed physical, chemical, and/or biological analysis of a dangerous waste</i> provided by the waste generator in order to allow the Solid Waste Operation Complex (SWOC) TSD Units (CWC, WRAP, T Plant, and LLBG Trenches 31 and 34) staff to perform waste evaluation. Previously used terms such as waste acceptance summary, waste storage, and disposal records, are examples of profiles for performing technical reviews for transfers between SWOC TSD units.
Solid Waste Operations Complex (SWOC)	A combination of treatment, storage, and disposal operating unit groups consisting of the CWC, Waste Receiving and Processing Facility (WRAP), T Plant, and Low Level Burial Grounds (LLBG) Trenches 31 & 34.
Testing	Performance of a procedure that yields a quantitative or qualitative evaluation of the type and/or quantity of materials present. Sometimes referred to as <i>laboratory analysis</i> , but for purposes of this document, the term <i>testing</i> is used to distinguish it from waste analysis (refer to definition of <i>analysis</i> above).
Verification	Determination that the waste in question is that waste described on the approved profile. Verification includes receipt, inspection, physical screening, and chemical screening of waste.
Waste Stream	Wastes that are physically or chemically similar to each other; wastes that are generated from the same types of processes; or wastes that are of the same type, but generated at different points in the process or at different process locations.

**ADDENDUM B:
WASTE ANALYSIS PLAN**

B.1 UNIT DESCRIPTION

The Waste Receiving and Processing Facility (WRAP) Operating Unit Group is located in the 200 West Area of the Hanford Site, Richland Washington. The WRAP Operating Unit Group provides storage and treatment for dangerous and/or mixed waste generated both on and off the Hanford Facility. Permittees may manage the following wastes, which are approved for storage and treatment at the WRAP Operating Unit Group: dangerous or mixed waste that is generated from processes at the Hanford site, or waste that is specifically identified in Section II, paragraph 8 of the Settlement Agreement re: Washington v. Bodman, Civil No. 2:30-cv-05018-AAM, January 6, 2006. No other wastes may be managed at WRAP unless authorized via a permit modification decision pursuant to Permit Condition I.C.3. Requests for Permit modifications must be accompanied by an evaluation adequate for Ecology to comply with the State Environmental Policy Act (SEPA).

This Waste Analysis Plan (WAP) describes processes for obtaining information on the chemical, biological, and physical characteristics of the dangerous waste managed in the WRAP Operating Unit Group to meet the requirements of the Washington State Department of Ecology Dangerous Waste Regulations, Washington Administrative Code (WAC) 173-303-300, General Waste Analysis.

This Waste Analysis Plan (WAP) documents the waste acceptance process, sampling methodologies, analytical techniques, and overall processes that the WRAP Operating Unit Group performs on dangerous waste that it accepts for storage and treatment within WRAP dangerous waste management units. This WAP contains information regarding the acceptance, confirmation, nondestructive examination (NDE) and nondestructive assay (NDA), repackaging, certification, movement, and management of newly generated waste, waste transfers from other SWOC treatment, storage, and disposal (TSD) Operating Unit Groups, WRAP generated waste and Waste Retrieval Project (WRP) waste.

For a detailed description of the WRAP Operating Unit Group refer to Addendum C, Process Information. Activities may be performed by the WRAP operating organization or its delegated representatives.

B.1.1 Description of Unit Processes and Activities

The WRAP Operating Unit Group consists of the following dangerous waste management units:

- 2336W Building (Process Area) (Storage, and Treatment within the gloveboxes)
- 2336W Building (NDE/NDA Area)(Storage)
- 2336W Building (Shipping and Receiving Area)(Storage)
- 2336W Building Room 152 (Storage)
- 2404-WA, Waste Storage Building (Storage and Treatment)
- 2404-WB, Waste Storage Building (Storage and Treatment)
- 2404-WC, Waste Storage Building (Storage and Treatment)

The WRAP dangerous waste management units provide structures, confinement equipment, and support functions. Within the 2336W Process Area gloveboxes the following waste management activities may occur:

- Visually examining waste, separating and sorting waste.
- Treating or managing prohibited waste components.
- Repackaging waste to meet shipping and/or waste acceptance criteria for the receiving TSD unit or offsite facility.

- 1 • Overpacking of dangerous or mixed waste.

2 Waste leaving the 2336W Building Process Area is typically ready to be transferred/ shipped to a
3 receiving TSD unit or offsite facility; however the waste may be stored at WRAP for a period of time
4 prior to transfer/shipping out of WRAP.

5 Waste treatment activities within the 2336W Building Process Area and the 2404-WC Building include:

- 6 • Deactivation,
- 7 • Solidification or absorption of liquids.
- 8 • Neutralization of corrosives.
- 9 • Microencapsulation.
- 10 • Macroencapsulation.
- 11 • Absorption to accomplish deactivation.
- 12 • Volume reduction of waste.
- 13 • Deactivation of reactive waste.

14 Repackaging of dangerous and/or mixed waste is allowed in the gloveboxes within the Process Area of
15 the 2336W Building dangerous waste management unit. Repackaging will not be considered treatment
16 pursuant to the definition of “treatment” in WAC 173-303-040.

17 Waste treatment activities within the 2404-WA and 2404-WB Buildings include:

- 18 • Absorption of free liquids.
- 19 • Absorption to accomplish deactivation.
- 20 • Neutralization of corrosive materials.

21 WRAP Operating Unit Group waste processes include:

- 22 • Assessment and evaluation of the waste stream information about newly generated dangerous
23 and/or mixed waste from Hanford onsite generators, and the Waste Retrieval Project (WRP). For
24 a description of WRP refer to Section B.2.3. This process ensures conformance with the WRAP
25 dangerous waste management units waste acceptance criteria prior to acceptance of the waste by
26 the WRAP Operating Unit Group.
- 27 • Receipt of waste from Hanford onsite generators and WRP.
- 28 • Completion and submittal of a waste stream data package or certification file.
- 29 • Generates new dangerous or mixed waste during processing.
- 30 • Management of the accepted waste for treatment and/or final disposal to WIPP.

31 Waste entering the WRAP dangerous waste management units will be packaged in containers of various
32 types and sizes according to United States Department of Transportation (DOT) Regulations, or alternate
33 on-site packaging requirements. Drummed waste will be examined by NDE and/or NDA. It will then be
34 sent directly to the WRAP Process Area dangerous waste management unit or transferred to the CWC
35 Operating Unit Group. Boxed waste will be examined by NDE and/or NDA. The boxed waste will be
36 managed in the WRAP Waste Storage Area A and/or transferred to CWC Operating Unit Group for
37 storage.

38 The 2336W Building Process Area dangerous waste management unit is a 650-square meter area and
39 contains four gloveboxes and a lid removal station. The Process Area gloveboxes are designed for
40 opening, sorting and sampling to characterize or confirm the contents of containers, and treating mixed
41 waste. Waste entering the WRAP Process Area dangerous waste management unit will be sorted in the
42 gloveboxes. Field screening or sampling will be conducted within the gloveboxes to perform verification
43 or assist in waste characterization.

1 Waste will be processed to meet the onsite Land Disposal Restriction (LDR) treatment standards pursuant
2 to WAC 173-303-140 or the offsite TSD facility requirements. Waste that meets TSD facility acceptance
3 criteria will be shipped for final disposal. For a detailed description of treatment areas and processes
4 within WRAP, refer to Addendum C, Process Information.

5 A lid removal station located within the 2336W Building will be used for removal of the inner lids of the
6 208- liter drums that are inside the 322-liter over-pack containers.

7 The Process Area provides secondary containment when mixed waste containers will be opened in the
8 gloveboxes. Automatic dry chemical fire extinguishment systems are situated inside the gloveboxes.

9 When additional sampling is necessary to verify treatment requirements, it will be performed in the
10 2336W Building Process Area or the laboratory in the MO-444 Building. Sampling from sealed
11 containers will be performed in the 2404-WA, 2404-WB, and 2404-WC Buildings. The samples will be
12 managed in the Process Area and/or the sample management areas in the 2336W Building and the MO-
13 444 and 2404-WA, 2404-WB, and 2404-WC Buildings prior to and after the analyses are performed. For
14 additional description regarding sampling areas within WRAP Operating Unit Group, refer to Addendum
15 C, Process Information.

16 **B.1.1.1 Waste Acceptance, Movement, Processing, and Management**

17 The WRAP Operating Unit Group waste tracking processes ensure that the waste received at any of the
18 WRAP dangerous waste management units matches the shipping manifest or transfer documents, and that
19 the waste is tracked through WRAP dangerous waste management units. The WRAP Operating Unit
20 Group maintains all the waste tracking information according to permit condition II.I.

21 Hanford onsite generating locations, including WRP, ship waste to the WRAP Operating Unit Group
22 according to Permit Condition II.N.

23 The WRAP Operating Unit Group tracks the waste through the following processes: segregation;
24 repackaging; treatment; transfers; and/or shipping for final disposal. The waste tracking process provides
25 a mechanism for tracking waste using a unique container identification number (Figure B.3.). The unique
26 number is a barcode (or equivalent) that will be recorded in an electronic data tracking system. This
27 electronic tracking container system encompasses acceptance, movement, processing, and management of
28 waste.

29 The WRAP Operating Unit Group assigns and maintains a unique container identification number when it
30 repackages waste in a new container. This container identification number links the hard copy and/or
31 electronic record to the container. These records will be maintained in accordance with Section B.8.,
32 Recordkeeping. The WRAP Operating Unit Group container identification number records contain
33 information on the location, quantity, and physical and chemical characteristics of the waste.

34 The following Sections, and Figures B.1 and B.2, describe the process for waste acceptance and required
35 documentation (container data and waste profile).

36 **B.1.1.1.1 Narrative Process Descriptions**

37 Wastes will be stored at the WRAP dangerous waste management units regardless of whether or not
38 compliance with LDR treatment standards has been met. For waste that meets the applicable LDR
39 requirements, the WRAP operating organization will maintain all the information (Section B.8.) to
40 demonstrate how these requirements have been met (Sections B.2.1.3.2 and B 7.3.).

41 The Hanford Facility is required to test certain mixed wastes when treatment standards are expressed as
42 concentrations to ensure that the waste or treatment residues are in compliance with applicable LDR
43 requirements (Section B.2.1.3.2 and B.7.3.). Such testing will be performed according to the frequency
44 specified in this WAP, as stated in 40 CFR 268.7(b), incorporated by reference in WAC 173-303-140.

1 **B.1.1.1.2 Waste Acceptance Process**

2 The waste acceptance process for the WRAP Operating Unit Group applicable to legacy, newly
3 generated, and WRP waste, consists of following activities:

4 Waste Stream Approval.

5 The generator provides information concerning each waste container in a particular waste shipment which
6 includes container data sheet and waste profile sheet. The container information will be reviewed against
7 the WRAP dangerous waste management units waste acceptance criteria. When the container
8 information is sufficient to fully evaluate compliance with waste acceptance criteria and meets the
9 applicable acceptance criteria, the container will be approved. In addition, the initial verification
10 frequency for the waste stream shipment will be determined by the requirements of the performance
11 evaluation system (PES) Section B.1.1.1.2.2. For a more complete description of the waste stream
12 approval process, refer to Section B.2.1.1.1

13 Waste Shipment/Transfer Approval.

14 The generator provides specific data for each waste container on the container data sheet. Each container
15 data sheet will be reviewed against the waste profile sheet and the WRAP dangerous waste management
16 unit acceptance criteria before approval for shipment or transfer. In addition, the WRAP operating
17 organization determines when any of the containers require verification based on the verification
18 frequency as determined by the PES. For a more complete description of the waste shipment or transfer
19 approval process, refer to Section B.2.1.1.2.

20 Verification.

21 All waste shipments or transfers will be subject to receipt inspection during the waste acceptance process.
22 The percentage of the waste stream selected for physical screening and/or chemical screening will be
23 determined in accordance with the requirements of the PES, Section B.1.1.1.2.2. Containers will be
24 opened and verified visually or by NDE. Of those containers subjected to physical screening, a
25 percentage will be subject to chemical screening by field and/or laboratory analysis. All information and
26 data obtained from physical and/or chemical screening will be evaluated to confirm that the waste
27 matches the waste profile and container information supplied by the generator. For a more complete
28 description of the waste verification process, see Section B.2.4.3.

29 **B.1.1.1.2.1 Types of Knowledge**

30 When collecting documentation on a waste stream or container, the WRAP operating organization must
31 determine if the information provided by the generator other than obtained from direct testing meets the
32 definition of *Knowledge in WAC 173-303-040, including Note 4: "Knowledge" may be used by itself or*
33 *in combination with testing to designate a waste pursuant to WAC 173-303-070(3)(c), or to obtain a*
34 *detailed chemical, physical, and/or biological analysis of waste as required in WAC 173-303-300(2).*

35 Knowledge requirements will be met by sampling and analysis, and/or historical data. Historical data
36 consists of detailed information from existing waste analysis data, or information on processes similar to
37 those that generated the waste, including but not limited to the following:

- 38 • Mass balance from a controlled process that has a specified input for a specified output.
- 39 • Material safety data sheets (MSDSs) on unused chemical products.
- 40 • Test data from a surrogate sample.
- 41 • Analytical data on the waste or a waste from a similar process.
- 42 • Interview information.
- 43 • Logbooks.
- 44 • Procurement records.

- 1 • Analytical data with qualifiers.
- 2 • Processes and/or methods.
- 3 • Process flow charts.
- 4 • Inventory sheets.
- 5 • Vendor information.
- 6 • Mass balance from an uncontrolled process (e.g., spill cleanup).
- 7 • Mass balance from a controlled process with variable inputs and outputs (e.g., washing/cleaning
- 8 methods).

9 All information meeting the definition of Knowledge will be applied to designate waste, quantify
10 constituents, and characterize the waste for its safe management to demonstrate compliance with WRAP
11 acceptance criteria and WAC 173-303.

12 **B.1.1.1.2.2 Description of Performance Evaluation System Committee (PES)**

13 The Performance Evaluation System Committee (PES) acts as an agent of the WRAP operating
14 organization and determines the initial physical screening frequency of each Hanford on-site generator's
15 waste stream. PES will provide a periodic status report for an individual generator's performance for all
16 waste received at WRAP Operating Unit Group. In addition, PES will provide a mechanism for
17 determining corrective actions, resolving waste acceptance issues, and physical screening frequency
18 adjustments when a conformance issue is discovered.

19 **B.1.1.1.2.3 Initial Physical Screening Frequency Determination**

20 The initial physical screening frequency is determined based on the following process.

- 21 • Personnel responsible for waste receipt at the WRAP Operating Unit Group review the generator
22 waste profile information to determine the relative potential for misdesignation or inappropriate
23 segregation based on all relevant information, including any previous experience with the
24 generator. Based on this review, any concerns will be identified associated with the following
25 criteria:
 - 26 – documented waste management program
 - 27 – waste stream characterization information
 - 28 – potential for inappropriate segregation.
- 29 • Based on the identification of concerns during the review, an initial physical screening frequency
30 will be established for the new generator's waste stream based on the following criteria:
 - 31 – Initial physical screening frequency of, at a minimum, 20 percent: No concerns have been
32 identified (e.g., cleanup of contaminated soil where the soil has been well characterized and
33 no other waste generation processes are occurring at that location)
 - 34 – Initial physical screening frequency of, at a minimum, 50 percent: Concern(s) have been
35 identified in one criterion
 - 36 – Initial physical screening frequency of 100 percent: Concerns have been identified in two or
37 more criteria.

38 **B.1.1.1.2.4 Performance Evaluation**

39 A performance evaluation will be used to track a generator's waste acceptance performance and will be
40 used to adjust and set the generator's overall physical screening frequency. This evaluation, identified as
41 an integral part of the QA program, objectively considers the conformance issues documented during the
42 Pre-shipment Review and Verification functions. The PES will maintain processes that: (1) perform
43 evaluations based on conformance issues identified, and (2) evaluate unsatisfactory performance for
44 corrective actions, and (3) adjust physical screening rates accordingly.

1 The performance evaluation will be conducted and subsequently accepted by PES, and the documentation
2 shall be maintained in accordance with Section B.8, Recordkeeping. Performance evaluation frequency
3 will be based on the generator's historical performance and the waste stream involved.

4 **B.1.1.1.2.5 Conformance Issue Resolution**

5 Conformance issues may result in a waste container not meeting the WRAP dangerous waste
6 management units waste acceptance criteria. A conformance issue is any discrepancy identified during
7 the confirmation process with waste package documentation, a waste package, or a shipment.
8 Discrepancies can be identified during pre-shipment reviews of waste streams during the verification
9 process. When a possible conformance issue is identified, the following actions will be taken to resolve
10 the discrepancy issue:

- 11 • The PES compiles all information concerning the possible conformance issue(s).
- 12 • The PES notifies and requests that the generator supply additional knowledge that may assist in
13 the resolution of the concern(s). When the generator supplies information that resolves the
14 concern(s) identified, no further action is required.
- 15 • Once PES identifies a conformance issue during verification, the WRAP operating organization
16 and the generator discuss the conformance issue and identify the appropriate corrective action to
17 resolve the container issue. The corrective actions may include returning the container to the
18 generator or transferring the container to another offsite TSD facility. When the conformance
19 issue(s) results in a waste stream failure, the physical screening frequency for all waste streams
20 that have the potential to exhibit a similar conformance issue from the generator will be adjusted
21 to 100 percent until the issue(s) are adequately addressed.
- 22 • The WRAP operating organization requests the generator, to provide a corrective action plan
23 (CAP) that clearly states the reason for the failure and describes the actions required to prevent
24 recurrence. The generator may request a reduction in verification of unaffected waste streams.
25 This request must be accompanied by a justification that identifies why these waste stream(s) will
26 not exhibit the same conformance issue.
- 27 • The WRAP operating organization reviews the CAP and waste stream justification for adequacy.
28 When the CAP is considered inadequate by the WRAP operating organization, the generator's
29 screening rate cannot be dropped down to the baseline frequency until an approved CAP is in
30 place. When the waste stream justification is adequate, the WRAP operating organization may
31 provide an alternative frequency as denoted in Section B.1.1.1.2.6.

32 **B.1.1.1.2.6 Process for Reducing the Physical Screening Frequency**

33 Physical screening rate frequencies and changes to those frequencies may be applied to a specific waste
34 stream, to a specific contractor, or to a specific offsite generator based on the circumstances surrounding
35 the conformance issue. After the WRAP operating organization establishes or increases the initial
36 physical screening frequency, the frequency may be reduced in accordance with the following process.

37 The WRAP operating organization reduces physical screening in three steps. Reduction for all steps will
38 be based on the generator's ability to demonstrate that five containers from the waste stream in question
39 pass verification. In addition, reduction to the baseline frequency requires that the WRAP Operating Unit
40 Group documents an acceptable evaluation of the corrective action plan. At no time will the physical
41 screening frequency be reduced below 5 percent (minimum allowable) for waste generated onsite or
42 below 10 percent for offsite generators.

43 Step 1) Reduce frequency by up to 66 percent after five containers from the waste stream in question pass
44 verification.

45 Step 2) Reduce frequency established in Step 1 by up to 50 percent after five containers from the waste
46 stream in question pass verification.

1 Step 3) Reduce frequency established in Step 2, to the baseline frequency after five containers from the
2 waste stream in question pass verification. The WRAP operating organization documents the
3 acceptable evaluation of the corrective action plan.

4 The physical screening rate reduction will be established during periodic PES evaluations, and the
5 documentation will be maintained according to Section B.8, Recordkeeping. The percentage of the
6 reduction will be based on the evaluation of the relative severity of the original conformance issue, the
7 status of the corrective action plan, any interim actions taken by the generator, and the generator's
8 historical performance for this waste stream before this reduction.

9 **B.1.1.2 Operating Conditions**

10 The WRAP will conduct waste management operations in accordance with the design and engineering
11 requirements of waste management structures and equipment, and with all equipment manufacturer
12 specifications and operating processes. Before treatment and storage of waste, the WRAP will have
13 processes in place for safe management of the waste. These processes consider actual or potential risks
14 posed by the waste treatment and/or storage equipment. The WRAP operating Unit Group will conduct
15 all waste treatment and/or storage according to these processes and complies with labeling, container
16 management, and inspection requirements of WAC 173-303-630. Management of ignitable, reactive, or
17 incompatible waste within WRAP will be accomplished in accordance with Section B.7.2.

18 **B.1.2 Identification and Classification of Waste**

19 WRAP waste management operations will be conducted in accordance with the requirements of the
20 Permit. Before a waste is accepted into one or more of the WRAP dangerous waste management units its
21 properties will be evaluated to determine if the waste can be safely managed within the WRAP Operating
22 Unit Group. Waste storage and treatment activities in the WRAP Operating Unit Group will comply with
23 container management requirements described in the Permit [WAC 173-303-630]. Dangerous waste will
24 be accepted for storage and/or treatment in one of the previously identified WRAP dangerous waste
25 management units (Section B.1.1). The following waste types will not be authorized for storage and/or
26 treatment.

- 27 • Bulk liquid waste in tankers
- 28 • Bulk solids in trucks or roll-off boxes
- 29 • Shock sensitive waste
- 30 • Class 4 oxidizer waste (International Fire Code)
- 31 • Infectious waste.

32 The following waste types will be managed within the WRAP dangerous waste management units:

- 33 • Containerized liquids/free liquids.
- 34 • Pressurized gas cylinders and aerosol cans within containers.
- 35 • Bulk sodium metal (to be evaluated on a case-by-case basis).
- 36 • Labpack liquids.
- 37 • Solids/debris.
- 38 • Sludges/soils.

39 Unless otherwise prohibited by this WAP, newly generated waste and WRP waste could exhibit any or all
40 of the following characteristics: ignitable, toxic, corrosive, or reactive. Refer to Section B.7.2 for
41 regarding ignitable waste, reactive waste, or compatibility reviews.

42 In addition to the waste received at WRAP dangerous waste management units for storage and/or
43 treatment, the WRAP Operating Unit Group generates mixed and dangerous waste. This waste material
44 consists of items such as, but not limited to, personal protective equipment (PPE), rags, and spent

1 equipment contaminated with dangerous cleaning agents, lubricants, paints, or other dangerous materials
2 that designate as dangerous wastes when discarded. Field screening and sampling will be accomplished
3 in accordance with this WAP and occur at the point of waste generation or at the location where the waste
4 materials are stored.

5 Biological waste could consist of animal remains that were used for experiments.

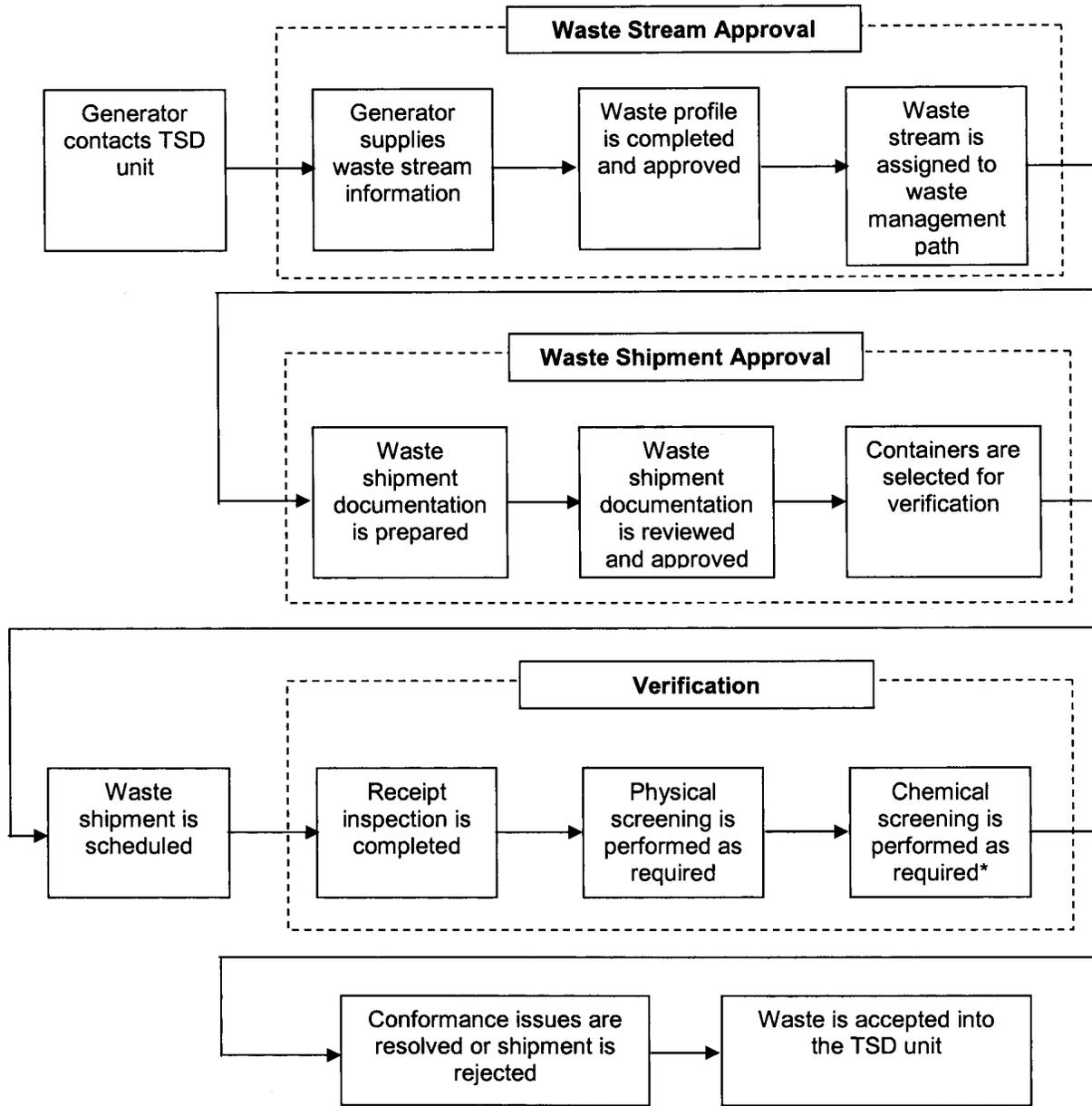
6 **B.1.2.1 Dangerous Waste Numbers, Quantities, and Design Capacity**

7 The WRAP Operating Unit Group Part A identifies dangerous waste numbers, quantities, and design
8 capacity.

9 Waste will be designated pursuant to WAC 173-303 using manufacturer's product information, MSDS,
10 laboratory analysis, and reference material such as *Registry of Toxic Effects of Chemical Substances*
11 (NIOSH). Waste will also be characterized in accordance with the requirements of 40 CFR 761. Waste
12 designated for the DW numbers enumerated in the table below (See the WRAP Part A form [Addendum
13 A]) can be accepted for storage in WRAP DWMU, subject to the additional waste acceptance criteria in
14 this WAP.

15 Designation for Waste Types accepted and stored at WRAP Operating Unit Group include:

Number	References
U and P numbers	WAC 173-303-9903-9904
F numbers (limited numbers refer to Part A)	WAC 173-303-9904
WPCB	WAC 173-303-9904
D001	WAC 173-303-090(5)
D002	WAC 173-303-090(6)
D003	WAC 173-303-090(7)
D004 through D043	WAC 173-303-090(8)
WT01 and WT02	WAC 173-303-100 and 104
WP01, WP02, and WP03	WAC 173-303-100 and 104
WSC2	WAC 173-303-090(6)/104



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2
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Figure B. 1 Waste Confirmation and Acceptance Process

* Trained WRAP personnel may conduct verification at the Hanford onsite generating location prior to shipment.

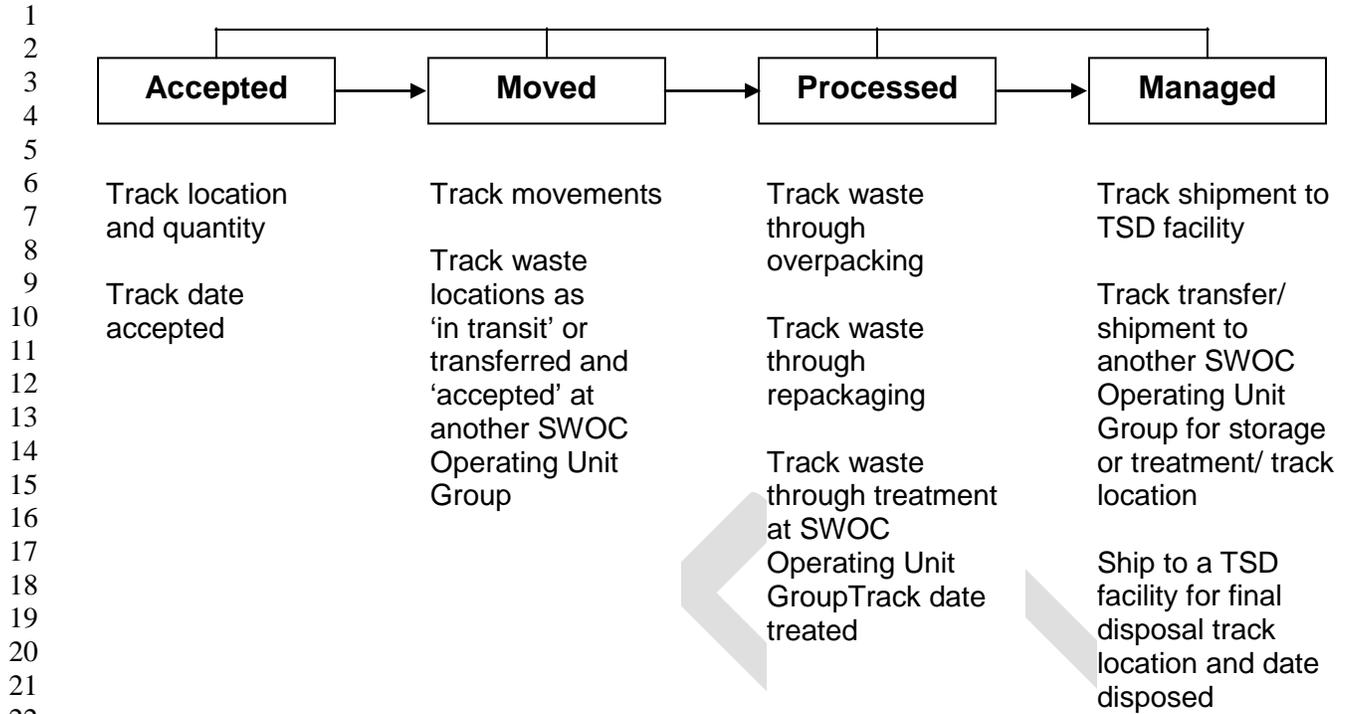


Figure B. 2 Waste Tracking

B.2 CONFIRMATION PROCESS

The waste stream approval, or waste confirmation process used to meet WAC 173-303-300 requirements includes;

- Applicable LDR treatment requirements shall be properly documented.
- Whether or not the waste stream meets waste acceptance criteria for dangerous waste management units in WRAP Operating Unit Group 7.

The waste stream approval process will ensure that the waste has been properly characterized for purposes of designation and evaluation against the WRAP dangerous waste management units waste acceptance criteria, and that all information will be of the appropriate quality for this purpose.

B.2.1 Newly Generated Waste

B.2.1.1 Pre-Shipment Review

Pre-shipment review takes place before waste will be scheduled for transfer or shipment to the WRAP Operating Unit Group. The review focuses on whether the waste stream is defined accurately, whether it meets the WRAP waste acceptance criteria, and the LDR treatment standards (for mixed waste subject to LDR treatment standards refer to Sections B.7.3. and B.7.2.1.). Only waste determined to be meet waste acceptance criteria for storage and/or treatment in the WRAP will be scheduled. This determination will be based on the information provided by the generator. The pre-shipment review consists of the waste stream approval and waste shipment approval process. The following sections discuss the pre-shipment review process. The information obtained from the generator during the pre-shipment review will, at a minimum, include all information necessary to safely store and/or treat the waste. The pre-shipment review will ensure that the waste has been characterized for purposes of evaluation against the WRAP waste acceptance criteria.

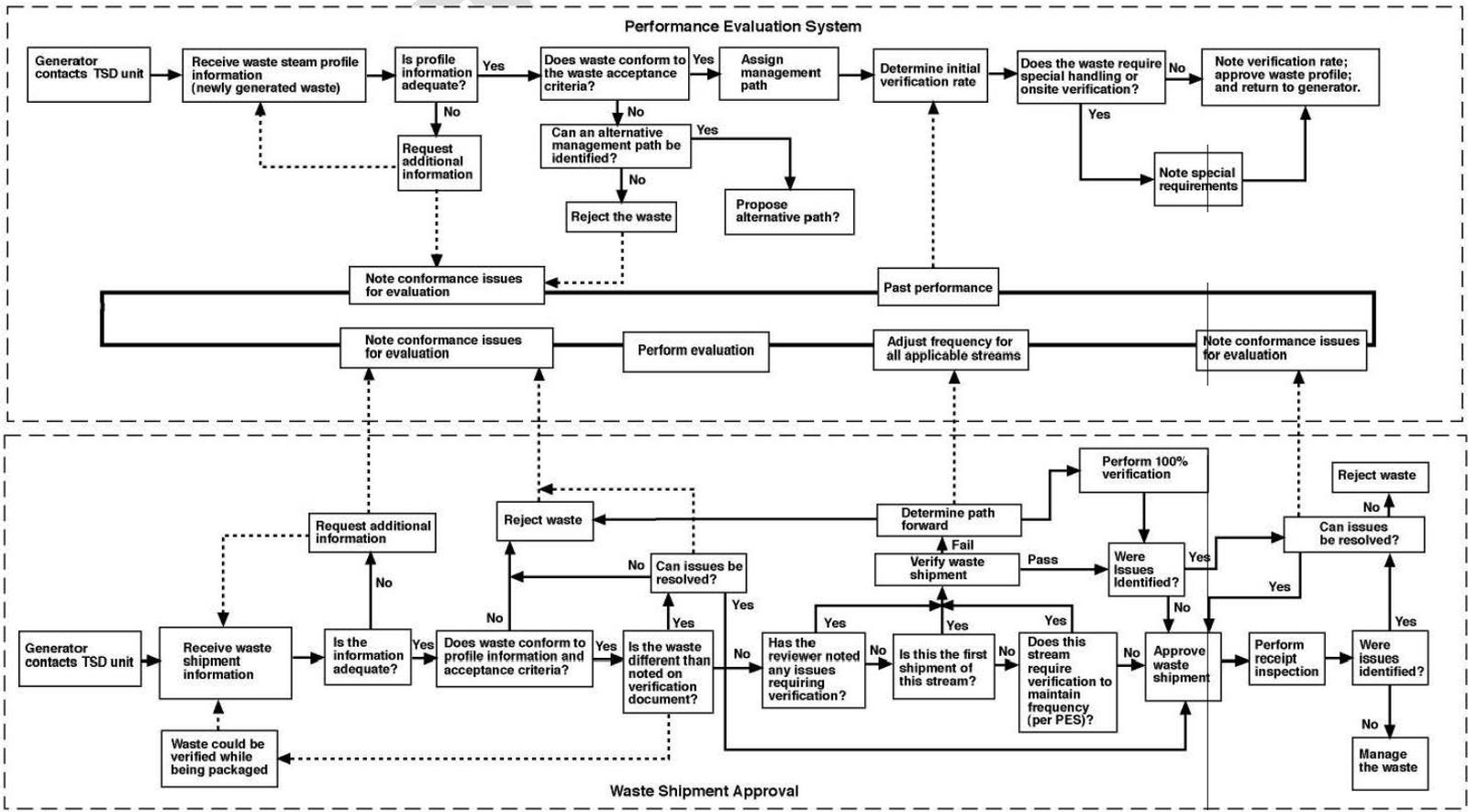
1 **B.2.1.1.1 Waste Stream Approval Process**

2 The waste stream approval process will consist of reviewing waste stream information provided on a
3 waste stream profile and/or attached analysis, or other approved processes authorized by this permit. At a
4 minimum, the waste stream profile will require the following information:

- 5 • Generator information (e.g., name, address, point-of-contact, telephone number).
- 6 • Waste stream name.
- 7 • Waste generating process description.
- 8 • Chemical characterization information (e.g., characterization method(s), chemicals present,
9 concentration ranges).
- 10 • Designation information.
- 11 • For mixed and/or dangerous waste applicable LDR treatment standards and a determination
12 whether the waste must be treated before land disposal including identification of constituents
13 subject to treatment for F001-F005 and F039, and underlying hazardous constituents (UHCs) as
14 applicable
- 15 • Waste type information (e.g., physical state, absorbents used, inert materials, stabilizing agents
16 used).
- 17 • Packaging information (e.g., container type, maximum weight, size).
- 18 • Attachments may consist of container drawings, process flow information, analytical data, etc.,

19 This information will be reviewed against the specific WRAP dangerous waste management unit's waste
20 acceptance criteria to ensure that the waste will be acceptable for receipt. When conformance issues are
21 found during this review, additional information will be requested. The request may include a
22 requirement for providing analytical data or additional data derived from sample analysis.

23 On determination that the waste is acceptable for receipt at the WRAP dangerous waste management unit,
24 the WRAP operating organization will assign a waste management path to the waste on the basis of the
25 waste profile and will establish a waste verification frequency based on the PES requirements.



..... Data input to PES or from PES
 — Documentation Process
 TSD = Treatment, storage, and/or disposal
 PES = Performance Evaluation System

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 3-14-02

Figure B. 3 Waste Acceptance Process

1 **B.2.1.1.2 Waste Shipment Approval Process**

2 For each waste transfer or shipment that will be a candidate for storage and/or treatment, the generator
3 will provide the following information:

- 4 • Container identification number
- 5 • Profile number (except for waste transfers of previously accepted waste)
- 6 • Waste description
- 7 • Generator information (e.g., name, address, point-of-contact, telephone number)
- 8 • Container information (e.g., type, size, weight)
- 9 • Dangerous waste numbers
- 10 • Designation as extremely hazardous waste or dangerous waste
- 11 • Waste composition
- 12 • Packaging materials and quantities.

13 The pertinent information will be entered into a waste information tracking system database and recorded
14 in the Operating Unit Group 7 section of the facility operating record according to the requirement of
15 Permit Condition III.7.D.1.

16 When potential conformance issues exist in the information provided, (e.g., waste characteristics do not
17 match the waste profile information, conform to the WRAP dangerous waste management unit's waste
18 acceptance criteria, or additional constituents are expected to be present that do not appear on the
19 documentation), WRAP operating organization will contact the generator for resolution.

20 For each container, a technical review will be performed. Physical screening determination and chemical
21 screening determination are defined in Section B.2.1.2.2. Technical review will be as follows:

- 22 • **Technical review.** The individual container data will be compared to the waste profile to ensure
23 that the waste to be shipped to the WRAP is as described by the waste profile.
- 24 • Based on the waste identification information provided, the waste designation will be reviewed to
25 ensure compliance with waste designations per WAC 173-303-070 through -100, as well as
26 evaluating whether the waste meets the WRAP waste acceptance criteria.

27 When the transfer or shipment information is found to be acceptable, the WRAP operating organization
28 will determine when any of the waste containers will be physically and/or chemically screened. The
29 WRAP operating organization will document the determination of shipment or transfer of waste to meet
30 the requirements of Section B.8, Recordkeeping of this WAP.

31 **B.2.1.1.3 Knowledge Requirements**

32 The WRAP operating organization will ensure that all information used to make waste management
33 decisions will be based on the requirements found in the following sections. Information determined to
34 be Knowledge must meet the definition of *Knowledge cited in WAC 173-303-040 including Note 4:*
35 *“Knowledge” may be used by itself or in combination with testing to designate a waste pursuant to WAC*
36 *173-303-070(3)(c), or to obtain a detailed chemical, physical, and/or biological analysis of waste as*
37 *required in WAC 173-303-300(2).* Information from sampling and analysis must meet the data quality
38 requirements for the associated waste acceptance criteria or parameters.

39 **B.2.1.1.3.1 General Knowledge Requirements**

40 General Knowledge requires (1) waste Knowledge requirements, (2) LDR waste Knowledge
41 requirements, and/or (3) waste Knowledge exceptions.

- 1 (1) **General Waste Knowledge Requirements for Designation and Waste Management.** At a
2 minimum, the generator will supply enough information for the waste to be treated and/or stored
3 at one or more of the WRAP dangerous waste management units identified in Section B.1.1.
- 4 (2) The minimum level of Knowledge will consist of designation data where the constituents or
5 knowledge of the waste's generating source (in the case of wastes potentially from listed
6 sources) causing a dangerous waste number to be assigned are quantified, and that data addresses
7 any WRAP Operating Unit Group operational parameters necessary for proper management of
8 the waste.

9 When historical data indicates that constituents are present which might cause the waste to be
10 regulated, testing can be performed to ensure that the constituents do not appear in the waste
11 above applicable regulatory levels. If the constituents are included in an input to a process and
12 historical data supports that the constituents are not expected to be in the waste, then sampling
13 will not be necessary. This requirement may be met through chemical screening. This testing
14 will be required only for initial characterization of the waste stream.

15 When the available information does not qualify as Knowledge or is not sufficient to characterize
16 a waste for management, the sampling and testing methods outlined in WAC 173-303-110 will be
17 used to determine whether a waste designates as ignitable, corrosive, reactive, and/or toxic. In
18 addition, sampling and testing methods will be used as applicable to determine whether the waste
19 contains free liquids.

20 If the testing is performed to complete characterization after acceptance of the waste by the
21 WRAP, then this WAP governs the sampling and testing requirements.

- 22 (3) **Waste Knowledge Requirements for LDR Compliance.** Waste will be stored at the WRAP
23 while awaiting analytical results for LDR requirements. The Hanford Facility Operating Record,
24 WRAP file will contain all the information required to document that the appropriate treatment
25 standards have been met or that the treatment required to meet the LDR treatment standards is
26 identified, unless otherwise specified in this section of the WAP.

27 For wastes with a concentration-based LDR treatment standard, analysis of a representative
28 sample will be required to demonstrate compliance with a concentration-based treatment standard
29 (refer to Section B.4, Selecting Sampling Processes). Corroborative testing for the sample will be
30 accomplished in the following manner:

- 31 • Generators use on-site laboratories or other laboratories to obtain data that will be
32 used as a basis to certify that the waste meets concentration-based LDR treatment
33 standards. For waste that must meet method based LDR treatment standards,
34 information must be supplied on the treatment methods necessary to meet LDR
35 requirements and comply with WAC 173-303-380(1)(j),-(k),-(n), and -(o).
- 36 • The WRAP will use these analytical data to meet applicable requirements found
37 in WAC 173-303-140(4).

38 **B.2.1.1.3.2 Waste Knowledge Exceptions**

39 The generator will provide information necessary to further disposition the waste (e.g., repackage
40 designate; segregate; sample; and analyze) when general knowledge requirements are not met.
41 However, the WRAP organization will ensure sufficient information is available regarding D001,
42 D002, D003, and incompatibility, and that operation safeguards are in place to safely process waste.

43 When sufficient information is not available to meet the general waste knowledge requirements for
44 designation and waste management or waste knowledge requirements for LDR Compliance
45 requirements, the waste can be accepted and will enter the discrepant container management process

1 described in Section B.2.5 in order to obtain the necessary information according to requirements of
2 this Waste Analysis Plan.

3 **B.2.1.1.4 Methodology to Ensure Compliance with Land Disposal Restrictions (LDR)** 4 **Requirements for Mixed and Dangerous Waste**

5 Dangerous and/or mixed waste deficient in meeting LDR treatment standards, but meeting the waste
6 acceptance criteria for WRAP dangerous waste management units, may be stored and/or treated at one or
7 more of the WRAP dangerous waste management units identified in Section B.1.1 The following are
8 general requirements for offsite notifications or on site information and supporting documentation:

- 9 • The waste is subject to LDR treatment standards and the generator has treated the waste. The
10 generator supplies the appropriate LDR certification information [40 CFR 268, incorporated by
11 reference into WAC 173-303-140].
- 12 • The waste is subject to LDR treatment standards and the generator has determined that the waste
13 meets the LDR for disposal. The generator develops the certification based on process
14 knowledge and/or analytical data and supplies the appropriate LDR certification information
15 necessary to demonstrate compliance with the LDR treatment standards of WAC 173-303-140.
16 State-only LDRs do not require this type of certification.
- 17 • The waste is subject to LDR and requires further treatment to meet applicable treatment standard.
 - 18 – The generator supplies additional information concerning the waste and details any treatment
19 necessary to meet applicable treatment standards.
 - 20 – If waste is treated to meet state-only or federal LDRs in one of the WRAP dangerous waste
21 management units, the WRAP operating organization prepares information necessary to meet
22 WAC 173-303-380(1)(k) (Section B.7.4.)

23 A representative sample of the waste must be submitted for analysis to ensure that concentration-based
24 LDR treatment standards are met. This sample will be taken by the WRAP operating organization or the
25 generator according to the requirements of this WAP and will be required to comply with the treatment
26 standards described in 40 CFR 268.40 and 268.48 for UHCs.

27 **B.2.1.2 Verification**

28 Verification is an assessment performed by the WRAP operating organization to substantiate that the
29 waste stream received at the WRAP, will be the same as represented by the analysis supplied by the
30 generator for the pre-shipment review. Verification will be performed on waste received by the WRAP
31 operating organization. Verification includes container receipt and inspection. In addition, select
32 containers may be subject to physical screening and chemical screening (Section B.2.1.2.2). Waste will
33 not be accepted into WRAP dangerous waste management unit for storage and/or treatment before the
34 required elements of verification have been completed. Documentation reviewed as part of verification
35 activities will include the shipping manifest or onsite shipping document, container inventory
36 documentation, a container listing report, visual verification records, screening analyses, and the waste
37 profile.

38 Qualified personnel conduct all waste verification activities: container receipt, inspection, physical
39 screening, and chemical screening. Qualified personnel will be trained as required by Addendum G,
40 WRAP Personnel Training, and Permit Condition II.C.

41 All conformance issues identified during the verification process will be resolved in accordance with
42 Section B.1.1.1.2.5., Conformance Issue Resolution.

43 Containers previously used to hold waste that is not acute hazardous waste as defined by WAC 173-303-
44 040 will be evaluated to determine if they are empty by using the following criteria: A container or inner

1 liner is “empty” when all wastes in it have been taken out that can be removed using practices commonly
2 employed to remove materials from that type of container or inner liner (e.g., pouring, pumping,
3 aspirating, etc.) and, no more than one inch of waste remains at the bottom of the container or inner liner,
4 or the volume of waste remaining in the container or inner liner is equal to three percent or less of the
5 container’s total capacity, or, if the container’s total capacity is greater than one hundred ten gallons, the
6 volume of waste remaining in the container or inner liner is no more than 0.3 percent of the container’s
7 total capacity.

8 The presence of free liquids which readily separate from the solid waste portion of dangerous waste will
9 be determined by either the paint filter test or through NDE.

10 **B.2.1.2.1 Container Receipt Inspection**

11 Container receipt inspection will be a mandatory element of the verification process. One
12 hundred percent of each shipment and transfer will be inspected at the WRAP dangerous waste
13 management units for possible damage or leaks, complete labeling, and if present, that tamper-resistant
14 seals are intact (Sections B.2.1.2.3 and B.2.2.3). This will ensure that the shipment;

- 15 (1) is received at the dangerous waste management unit in good condition,
- 16 (2) is the waste indicated on the transfer or shipping papers,
- 17 (3) has not been opened after physical and/or chemical screening was performed, and
- 18 (4) is complete.

19 When a conformance issue exists (Section B.2.5.), a case-by-case determination will be performed and
20 corrective action will be taken. One of the following actions may be taken as appropriate, in response to a
21 conformance issue:

- 22 • Implementation of the Addendum J, Contingency Plan.
- 23 • Resolution of conformance issues where additional information is needed to safely manage the
24 waste.
- 25 • Continuation of verification for waste with conformance issues not meeting all of the above
26 criteria.

27 **B.2.1.2.2 Physical Screening and Chemical Screening Determination**

28 A description of the activities for selecting containers for physical and chemical screening will be
29 maintained at the WRAP Unit Operating Group. Means of selecting containers for physical and chemical
30 screening will be applied based on the pre-shipment and/or waste stream review process. The container
31 selection will be based on the contents listed in the associated shipment/waste stream documentation,
32 historical documentation, and operational experience.

33 Two criteria will be used in making the selection. The first criterion is based on whether pre-shipment
34 review activities (document and characterization review) identify areas of potential concern. The second
35 criterion is reviewing the current physical screening percentage (calculated according to Section
36 B.2.1.2.4) of containers offered for receipt from said waste stream from said generator that have been
37 offered over the past 12 months or the date of the last physical screening adjustment, whichever is most
38 recent. The rate will be applied as compared to those that have been physically screened. This criterion
39 ensures that the minimum physical screening rates required by this WAP will be met.

40 The number of containers selected for physical screening per waste stream will be determined by
41 comparing the calculated percentage rate which is then adjusted according to the PES. This selected
42 group of containers constitutes a sample set.

43 After the required percentage verification on the shipment has been completed, the container(s) will be
44 scheduled for shipment.

1 **B.2.1.2.3 Physical Screening Process**

2 Physical screening is a verification element. This section describes the requirement pertaining to
3 methods, frequency, and exceptions concerning the use of physical screening as a verification element.
4 Physical screening could be performed before the waste is shipped to WRAP. When physical screening is
5 performed at a location not within the SWOC Operating Unit Groups, tamper-resistant seals will be
6 applied to each container after examination. Upon receipt at one of the WRAP dangerous waste
7 management units, tamper-resistant seals will be verified as intact to ensure that no changes have
8 occurred to the waste content during shipment to WRAP Operating Unit Group. Documentation of
9 physical screening will be maintained in accordance with Section B.8., Recordkeeping.

10 **B.2.1.2.3.1 Physical Screening Methods**

11 The following physical screening methods, comply with the requirement to verify a waste.

- 12 1. Visual inspection (opening the container)
13 2. NDE.

14 Refer to Section B.2.1.3.3.1 for QC pertaining to physical screening. (Refer to Section B.3.1. for the
15 criteria and rationale for choosing a physical screening method.)

16 Waste packaging that is witnessed by WRAP Operating Unit Group personnel or its representative at a
17 non-SWOC Operating Unit Group, will be considered to have met the physical screening requirements
18 denoted in this WAP, provided that the packaging meets the requirements of WAC 173-303 and that
19 the witness is qualified and trained to determine that the waste meets waste acceptance criteria for the
20 specific WRAP dangerous waste management unit. On closure of the container, tamper-resistant seals
21 must be applied to ensure the integrity of the contents. Procedures will be maintained by the WRAP
22 Operating Unit Group detailing the requirements for adding and/or removing tamper-resistant seals.

23 **B.2.1.2.4 Physical Screening Frequency**

24 The minimum physical screening frequency will be 5 percent for onsite generators, applied per waste
25 stream per generator per year. For offsite generators, the minimum physical screening frequency is 10
26 percent per waste stream per generator per year. The WRAP operating organization adjusts the physical
27 screening frequency for generators based on objective performance criteria (refer to Section B.1.1.1.2.6.).

28 If a container fails verification, the waste stream physical screening frequency will be raised to 100
29 percent for the next containers offered. Subsequent containers offered will be evaluated through the PES
30 for verification rates, as described in Section B.1.1.1.2.4.

31 **B.2.1.2.5 Physical Screening Exceptions**

32 The following are exceptions to the physical screening process outlined previously.

- 33 • Shielded, classified, and remote-handled mixed waste will not be required to be physically
34 screened; however, the WRAP operating organization performs a more rigorous documentation
35 review and obtains the raw data used to characterize the waste (less than 1 percent of current
36 waste receipts). For classified waste, it will be necessary to have an appropriate U.S. Department
37 of Energy security clearance and a need to know the information as defined by the classifying
38 organization or agency.
- 39 • Waste that physically cannot be screened at one of the WRAP dangerous waste management
40 units, must be physically screened at the generator location [e.g., large components, containers
41 that cannot be opened, for as low as reasonably achievable (ALARA) purposes, or does not fit
42 into a NDE unit]. Physical screening at the generator location will consist of observing the
43 packaging of the waste. When no location can be found to perform the physical screening, no
44 screening is required.

- 1 • Waste that is packaged by a trained WRAP Operating Unit Group -delegated representative(s)
- 2 will be considered to have met the physical screening requirements as denoted within this WAP.
- 3 • Waste that has been packaged and physically screened at a SWOC TSD unit.

4 **B.2.1.3 Chemical Screening Process**

5 Chemical screening is a verification element. This section describes methods, frequency, and exceptions
6 for chemical screening. Chemical screening may be performed before the waste is shipped to one of the
7 WRAP dangerous waste management units. When screening is performed at a location not within the
8 following Operating Unit Groups (CWC, T-Plant or WRAP), tamper-resistant seals will be applied to
9 each container examined and, on receipt at one of the WRAP dangerous waste management units,,
10 verified as acceptable to ensure that no changes could have occurred to the waste content before receipt at
11 one of the WRAP dangerous waste management units. Processes will be maintained by the WRAP
12 Operating Unit Group detailing the requirements for adding and/or removing tamper-resistant seals.
13 Chemical screening documentation will be maintained in accordance with Section B.8., Recordkeeping.

14 Unless otherwise noted, tests are qualitative, not quantitative. The objective of chemical screening will be
15 to obtain reasonable assurance that the waste is generally consistent with the description on the container
16 shipping documentation. The following tests will be selected depending on the waste matrix and the
17 applicability of the method:

- 18 • pH
- 19 • Peroxide
- 20 • Oxidizer
- 21 • Water reactivity
- 22 • Halogenated Organic Carbons - HOC (chlor-n-oil/water/soil)
- 23 • Headspace
- 24 • Sulfide
- 25 • Cyanide
- 26 • Paint filter.

27 Refer to Section B.2.1.3.3.1, Physical Screening Quality Control for QC information for chemical
28 screening. Processes will be maintained by the WRAP operating organization that defines the bases for
29 selecting screening tests.

30 **B.2.1.3.1 Chemical Screening Frequency**

31 At a minimum, 10 percent [round up to the nearest whole number of container(s)] of the mixed or
32 dangerous waste containers verified by physical screening (Section B.2.2.3) must be screened chemically.

33 Small containers of waste (labpacks), not otherwise identified in the exceptions and packaged in
34 accordance with WAC 173-303-161 will be screened chemically in accordance with the chemical
35 screening frequency of the waste stream as determined by the PES team (Section B.1.1.1.2.2.). Inner
36 containers will be segregated by physical appearance. At least one container from each group (or three
37 containers if all are similar) will be screened chemically.

38 **B.2.1.3.1.1 Chemical Screening Exceptions**

39 Chemical screening will not be required for the following:

- 40 • Small containers of waste in overpacked containers (labpacks) packaged in accordance with
41 WAC 173- 303-161 and not prohibited under LDR specified in WAC 173-303-140.
- 42 • Waste exempted from the physical screening requirements (Section B.2.1.2.5).

- 1 • Commercial chemical products in the original product container(s) (e.g., off-specification,
2 outdated, or unused products)
- 3 • Chemical containing equipment removed from service, (e.g., ballasts, batteries)
- 4 • Waste containing asbestos
- 5 • Waste, from the cleanup of spills or release of single substance or commercial product or
6 otherwise known material (e.g., material for which an MSDS can be provided)
- 7 • Confirmed noninfectious waste (e.g., xylene, acetone, ethyl alcohol, isopropyl alcohol) generated
8 from laboratory tissue preparation, slide staining, or fixing processes
- 9 • Hazardous debris as defined in WAC 173-303-040
- 10 • Other special cases could be exempted from chemical screening on a case-by-case basis with
11 Ecology approval.

12 The aforementioned wastes will be exempted from chemical screening and will be documented in
13 accordance with Section B.8., Recordkeeping.

14 **B.2.1.3.2 Sampling for Confirmation Screening**

15 Sampling will be performed in accordance with WAC 173-303-110(2) to ensure that the samples are
16 representative of the waste being sampled. A representative sample will be obtained for chemical
17 screening. The chemical screening methods do not require any sample preservation methods because the
18 screening tests will be performed at the time and location of sampling, or as soon as possible thereafter.
19 During the interim period, the samples will be stored in a manner that maintains chain of custody and
20 protects the sample composition.

21 **B.2.1.3.3 Quality Assurance and Quality Control for Confirmation Process**

22 The following quality assurance (QA) and quality control (QC) elements will be used by the WRAP
23 operating organization to ensure that the confirmation activities generate the data essential to providing an
24 indication that waste received will be as described in the pre-shipping documentation. Data quality
25 objectives have been established in accordance with TPA Action Plan Section 6.5 and have been
26 documented and reflected in this WAP. In addition, all screening equipment requiring calibrations will be
27 checked before use to ensure that calibration dates are current and equipment is functioning properly.
28 This check will be documented in equipment log books. During screening activities strict compliance
29 with applicable industrial hygiene and safety standards will be required.

30 **B.2.1.3.3.1 Physical Screening Quality Control**

31 This section describes the QC used by WRAP Operating Unit Group personnel to ensure that reliable data
32 will be obtained when performing physical screening methods identified in Section B.2.1.2.3.1, except
33 visual inspection. Physical screening QC will be used only to ensure that quality data are obtained when
34 performing NDE. QC objectives for visual inspection will be performed by properly trained personnel
35 through training as specified in the WRAP Addendum G, Personnel Training.

36 The following QC elements apply to NDE used for physical screening:

- 37 • A resolution test will be performed at the beginning of a shift. A shift ends when shutdown
38 activities are performed. A shift can be up to 24-hours.
- 39 • A radiographer will be qualified per SNT-TC-IA, Level II certification of American Society of
40 Nondestructive Testing training.
- 41 • Examination must cover 100 percent of the waste in the container.

42 **B.2.1.3.3.2 Chemical Screening Quality Control**

43 The following QC elements will be used when performing chemical screening.

- 1 • Appropriate sample containers and equipment will be used.
- 2 – Containers and equipment of the appropriate size that are chemically compatible with the
- 3 waste and testing reagents will be used.
- 4 • Reagent checks
- 5 – Water that is reagent grade and from a documented source is used.
- 6 – Chemicals and test kits are labeled so that they are traceable and documented in the Hanford
- 7 Facility Operating Record, WRAP Operating Unit Group file.
- 8 – QC checks are performed on each lot of test kits and associated reagents according to the test
- 9 kit instructions and documented in the Hanford Facility Operating Record, WRAP Operating
- 10 Unit Group file.
- 11 – If the QA/QC checks for a specific test kit are not within the acceptable range based on the
- 12 manufacturer's instructions, the test kit is removed from service. A new test kit is put into
- 13 service after satisfactorily passing the required QC checks.

14 **B.2.1.4 Waste Acceptance**

16 Initial acceptance of waste occurs only after the confirmation process described in Section B.2 is
17 complete. Conformance issues identified during the confirmation process will be documented and
18 managed in accordance with Section B.1.1.1.2.5. Prior to transfer the following conformance issues will
19 be corrected before waste acceptance:

- 20 • Waste does not match approved profile documentation,
- 21 • Designation, physical, and/or chemical characterization discrepancy,
- 22 • Incorrect LDR paperwork,
- 23 • Manifest discrepancies as described in WAC 173-303-370(4)(a) for offsite shipments unless
- 24 Permit Conditions II N can be utilized.
- 25 • Packaging discrepancy.

26 Waste that does not meet the CWC waste acceptance criteria can be accepted when that waste is tracked
27 for discrepancy resolution. The discrepancy resolution activities will be tracked to completion (refer to
28 Section B.2.5).

29 **B.2.2 Waste Transfers between Solid Waste Operations Complex (SWOC) TSD** 30 **Operating Unit Groups**

31 For waste that will be transferred from the CWC or T Plant Operating Unit Groups to the WRAP
32 Operating Unit Group, the following requirements apply.

33 **B.2.2.1 Waste Stream Approval Process**

34 The waste stream must already have been approved using a profile as described in Section B.2.1.1.1
35 Waste Knowledge exceptions apply as described in Section B.2.1.2.5 and B.2.1.3.1.1.

36 **B.2.2.2 Waste Transfer Approval Process**

37 A technical review of documentation associated with all containers in the shipment will be performed
38 prior to transfer from other SWOC TSD Operating Units to WRAP and documented in accordance with
39 Section B.8., Recordkeeping. When necessary, the waste management path (waste specification record)
40 previously assigned to the waste stream will be updated and re-labeling/remarking will be completed
41 before the transfer. Waste will be tracked through processing at the WRAP dangerous waste management
42 units in accordance with Section B.1.1.1. When the characteristics of the waste change as a result of
43 treatment or other processing, documentation of the change will be in accordance to Section B.8,
44 Recordkeeping. As new information is obtained on the waste, the container will be managed to meet any

1 new requirements. Updates to container data prior to transfer and subsequent processing activities will be
2 reflected in solid waste information tracking system, documented, and will be maintained in accordance
3 with Section B.8., Recordkeeping.

4 **B.2.2.3 Verification**

5 For container receipt inspection, all of the containers of each transfer will be visually inspected for
6 damage and to ensure that the waste containers are those indicated on the documentation. This activity
7 will be the means for identifying any document conformance issues or damaged containers before
8 receipt/acceptance into WRAP. Conformance issues identified during receipt will be managed as
9 described in Section B.2.1.2.1.

10 Transfers from other SWOC TSD Operating Unit Groups to CWC are subject to physical screening, the
11 Performance Evaluation System, and chemical screening only if the waste package has not been
12 previously subjected to the process. If a waste package has been verified, further verification upon
13 transfer within SWOC is not required.

14 **B.2.3 Waste Retrieval Project (WRP) Waste Transfers**

15 Beyond what is normally contained in a WAP, the following sections contain process information
16 provided for clarification purposes only. The Waste Retrieval Project (WRP) waste was placed in the
17 218-W-4B, 218-W-4C, 218-W-3A, and 218-E-12B burial grounds after May 6, 1970 up until the time
18 transuranic (TRU) waste was stored in aboveground storage buildings. At the time it was placed in the
19 burial grounds, the waste met the definition of TRU waste. WRP waste will be removed from the burial
20 grounds (retrieved) and managed in accordance with the Tri-Party Agreement (TPA) M-091 series of
21 milestones (Attachment 1 of the Hanford Facility Dangerous Waste Permit). WRP waste is presumed to
22 be TRU mixed (TRUM) waste prior to commencing retrieval. WRP TRUM waste can be reclassified to
23 mixed low level waste (MLLW) during the course of retrieval or subsequent storage.

24 WRAP, CWC and T Plant are Operating Unit Groups that manage WRP waste. WRP TRUM waste will
25 be evaluated for acceptance for shipment to an off-site disposal facility pursuant to the Land Withdrawal
26 Act. WRP MLLW will be evaluated for storage and/or treatment for eventual disposal at an on-site
27 disposal facility. Offsite TSD facilities can be used to supplement the processing/treatment of WRP
28 TRUM waste and MLLW. WRP waste stream waste acceptance process is as defined in Section
29 B.1.1.1.2.

30 **B.2.3.1 Waste Information Pre-Shipment Review**

31 Waste knowledge must be sufficient to designate the waste in accordance with WAC-173-303-070
32 through -100 and to properly manage the waste. This includes sufficient information to properly
33 segregate the waste, and to demonstrate that the waste meets acceptance criteria for subsequent on-site
34 TSD units or offsite TSD facilities.

35 Waste information is summarized in acceptable knowledge (AK) packages as allowed by WAC 173-303-
36 070(3)(c)(ii) consisting of information from burial records, waste stream descriptions including buildings
37 and processes, and the packaging requirements applicable during the time the waste was placed into the
38 burial grounds. The AK review includes the operational history from the waste generating areas and the
39 processes that generated the waste.

40 The AK data compiled provides the basis for the waste designation. The waste designation assures the
41 waste can be safely managed, segregated for storage, and/or transferred to an on-site TSD unit or offsite
42 TSD facility. The AK package is documented in the operating record for WRAP.

43 Collecting sufficient information for WRP waste presents several unique challenges. The WRP waste
44 was generated at locations on and off the Hanford Facility. The WRP waste consists primarily of debris
45 with small amounts of non-debris solid waste including containerized liquids with sufficient sorbent to
46 solidify the liquids. Packaging requirements to ensure only disposal of sorbed liquids in small amounts

1 were in place in 1970 when WRP waste was placed into the burial grounds (December 1970, ARH-1842).
2 For containers that may have contained liquids, sufficient absorbents were added so that liquid is retained
3 in the absorbent and will not flow if the container is breached. A variety of materials have been used to
4 meet this requirement including: vermiculite, diatomaceous earth, concrete, and sawdust. This
5 information (free-flowing liquids are prevented via absorbent) is applied to the container unless new
6 information is obtained on the container.

7 Container sizes of WRP waste range from 55 gallon drums to very large boxes of various sizes. Since the
8 waste was placed in the burial grounds up to approximately 40 years ago, the containers have degraded
9 and many of the identification markings have become unreadable, or in some cases, no markings at all
10 were applied to the container. When the package identification number is still legible on the container, an
11 attempt is made to identify the contents of the container from the information contained on the burial
12 record and AK package. When the container cannot be identified, the container is termed
13 “unidentifiable.” For unidentifiable waste containers that consist of multiple sources of generating
14 locations and processes, the AK package applies a conservative waste designation to each container.

15 During processing of the WRP waste, additional information is generated and is then added to the waste
16 record. Additional information is reviewed to determine if the storage category (hazard class) should be
17 updated, or if the container should be stored in secondary containment. Compatibility reviews are
18 performed in accordance with Section B.7.2 on the AK packages.

19 **B.2.3.2 Waste Container Evaluation**

20 Prior to placement in the burial grounds, a variety of containers were utilized to package WRP waste
21 including, but not limited to: 55 gallon drums, 110 gallon containers, fiberglass reinforced plywood
22 boxes, cleated plywood boxes, concrete boxes, and steel boxes. Prior to removal of WRP waste from the
23 burial ground trench, burial records and subsurface scanning techniques are used to obtain data on the
24 location of the containers. Several techniques have been used and are being used for the retrieval of these
25 containers. Typically, the first step within the trench involves the removal of overburden and remaining
26 soil to expose the container. Operational controls to prevent exposure to the waste are utilized throughout
27 this process.

28 When the container is exposed, a visual check is performed to identify leaks, dents, bulges, and
29 degradation. Health and safety surveys and monitoring of the container and the surrounding area are
30 performed. The container will be removed when a determination is made that this process will not result
31 in the spread of contamination. If the condition of the container is damaged or corroded it will be
32 mitigated. Mitigation techniques depend on the type of container, but may include: overpacking, shoring
33 of the box, and packaging WRP waste into a new container. Protective coverings are applied to the large
34 containers to protect the containers from ultra violet rays and weather. When the process of removing the
35 WRP waste from the trench has been completed, the waste is packaged in a container that can be safely
36 transported and stored in WRAP or other receiving facility.

37 **B.2.3.3 Pre-Transfer Review**

38 Transfer of the WRP waste out of the burial grounds is necessary to perform subsequent processing,
39 treatment, and/or characterization. When a transfer to CWC, WRAP, or T Plant occurs, a pre-transfer
40 review takes place before transfer from a burial ground is scheduled and a determination is made on the
41 ability to transfer. The pre-transfer review determination is based on the characterization of the waste
42 (described in Section B.2.3.1) and information collected during the management of the WRP waste in the
43 burial ground(s). WRP waste transfers between TSD units also occur (CWC, WRAP, T Plant) and are
44 governed by this section.

1 **B.2.3.4 Verification**

2 For container receipt inspection, all of the containers of each transfer will be visually inspected for
3 damage and to ensure that the waste containers are those indicated on the documentation. This activity
4 will be the means for identifying any document conformance issues or damaged containers before
5 receipt/acceptance into WRAP. Conformance issues identified during receipt will be managed as
6 described in Section B.2.1.2.1.

7 Transfers of WRP waste are not subject to physical screening beyond the visual check identified in
8 Section B.2.3.2, the Performance Evaluation System, and chemical screening processes.

9 **B.2.3.5 Discrepant WRP Containers**

10 During the retrieval and management of the waste, conditions can change or new information is obtained
11 on WRP waste. The container will be evaluated under the discrepant container management program
12 according to Section B.2.5.

13 **B.2.4 WRAP Generated Waste**

14 The WRAP generates dangerous and/or mixed waste while processing. This waste material consists of
15 items including, but not limited to: personal protective equipment, rags, and spent equipment
16 contaminated with dangerous cleaning agents, lubricants, paints, run-off from WRAP Outside Storage
17 Area A, or other dangerous materials that designate as dangerous waste when discarded. Operational
18 Knowledge is used to characterize these waste materials for the purposes of waste designation. Waste
19 generated by WRAP is considered accepted at WRAP when the waste is generated. All Knowledge and
20 confirmation of Knowledge concerning WRAP generated waste will be documented in accordance with
21 Section B.8., Recordkeeping.

22 **B.2.4.1 Waste Stream Approval Process**

23 Documenting operational Knowledge constitutes the waste stream approval process.

24 **B.2.4.2 Waste Transfer Approval Process**

25 No transfer occurs while the waste resides in WRAP. If the waste is transferred to another SWOC unit,
26 the requirements for a SWOC transfer in Section B.2.3 apply.

27 **B.2.4.3 Verification**

28 Any container is exempt from verification requirements when the container resides in WRAP.
29 Verification requirements include the container receipt inspection, physical screening, the Performance
30 Evaluation System, and chemical screening.

31 **B.2.5 Discrepant Container Management**

32 During the waste acceptance process or during subsequent management of waste at any of the WRAP
33 dangerous waste management units, an issue may arise in which a waste container demonstrates a
34 discrepant condition. Such containers will be tracked as a 'discrepant container' until the issue is
35 resolved. The following list of issues will be tracked under the discrepant container management
36 program:

- 37 • Indications of bulging,
- 38 • Containers with unknown contents,
- 39 • Containers holding waste prohibited under Section B.1.2,
- 40 • Containers no longer in good condition and not in compliance with WAC 173-303-630(2),
- 41 • Inconsistent inventory between container contents and the record, and
- 42 • Unexpected liquids are found.

1 The following processes and criteria will be initiated for a discrepant container. The criteria may be
2 modified through the permit modification process in the future to address specific waste management
3 issues.

- 4 • An evaluation will be performed on available historical data. In addition, interviews could be
5 performed with generator points-of-contact, NDE personnel, etc.
- 6 • Nonempty containers as defined by WAC 173-303-160(2) in which liquids are discovered, will
7 be placed in secondary containment that meets the requirements of WAC 173-303-630(7)(a),
8 except when demonstrated that liquids are completely absorbed. Containers with discovered
9 liquids and with sufficient absorbent to completely absorb the liquids and that otherwise meet the
10 requirements of WAC 173-303-630(7)(c) may be managed in container storage units without
11 secondary containment. For combination packages¹, if the liquids are only present within inner
12 containers and no free liquids are present in the outer container, the external container will serve
13 as secondary containment, provided that the combination package can be managed in a manner
14 that meets the requirements of WAC 173-303-630(7)(a) and the compatibility requirements in
15 WAC 173-303-395(1).
- 16 • When additional information about the waste becomes available to warrant a compatibility
17 evaluation, an evaluation will be performed to ensure the compatibility with the other materials in
18 the container and with the outer container in accordance with WAC 173-303-395(1)(b). This
19 evaluation will be documented in the unit operating record in accordance with WAC 173-303-
20 395(1)(c). Liquids not determined to be compatible will be segregated in accordance with
21 Addendum C, Process Information.
- 22 • If adequate information is unavailable to determine the liquids constitute an imminent hazard, the
23 container will be segregated as incompatible waste in accordance with Addendum C, Process
24 Information.
- 25 • For waste where the generator can be contacted, the generator will be requested to provide
26 additional information. The container will be dispositioned by either returning it to the generator
27 (provided it can be transported safely and compliantly) by resolving the discrepancy on the
28 container at the WRAP, CWC or T-Plant Operating Unit Groups.
- 29 • Based upon the evaluation of information (hazards identified) the container will be managed in a
30 safe configuration.
- 31 • The container will be tracked for discrepancy resolution.

32 **B.2.6 Sampling and Analysis Plans**

33 A sampling and analysis plan (SAP) may be developed outside the WAP to support the characterization
34 of waste for various projects. A SAP provides sufficient detail to ensure that sampling personnel and the
35 analytical laboratory correctly implement the DQOs and quality assurance project plan requirements
36 pursuant to TPA agreement action plan, Section 6.5. SAPs can utilize existing Knowledge, historical
37 information and/or additional analytical data in combination with sampling requirements as identified in
38 the SAP to sufficiently characterize a waste stream for acceptance into one of the WRAP dangerous waste
39 management units. Ecology will review all SAPs and SAP revisions associated with this WAP prior to
40 implementation.

¹ A combination package is any configuration where dangerous and/or mixed wastes are confined within (inner) containers, which are in turn stored within secondary, external (outer) containers. Examples include labpacks, certain overpacks, portable spill pallets, or any container configuration that has an outer container with one or more inner containers.

1 **B.3 SELECTING WASTE ANALYSIS PARAMETERS**

2 Physical and chemical screening parameters for verification will be chosen from those in Sections B.3.1
3 and Parameters for waste designation, and meeting LDR requirements will be addressed in Section B.3.3.
4 Each physical and chemical screening result must be in agreement with the shipping documentation.
5 Conformance issues identified during the confirmation process will be documented and managed in
6 accordance with Section B.1.1.1.2.5. Parameters, methods, and rationale for physical and chemical
7 screening parameters appear in Table B. 1 below.

Table B. 1 Parameters and Rationale for Physical and Chemical Screening

Parameter	Method ^a	Rationale for Selection
Physical Screening		
Visual inspection	Field method – observe phases, presence of solids in waste	Evaluate consistency between waste and shipping documentation and determine the presence of free liquids.
Nondestructive evaluation	Field method	Evaluate consistency between waste and shipping documentation and determine the presence of free liquids.
Chemical Screening		
Ignitability and/or headspace for volatile organic compound screening	Organic vapor monitor, colorimetric gas sampling tubes, or a lower explosive level meter	Confirm consistency between waste and shipping documentation; determine from test results whether the preventive measures identified in WAC 173-303-395(1)(b) must be applied to manage the waste in compliance with permit conditions.
Peroxide	Field peroxide test paper	Confirm consistency between waste and shipping documentation; determine from test results whether the preventive measures identified in WAC 173-303-395(1)(b) must be applied to manage the waste in compliance with permit conditions.
Liquids	SW-846, Method 9095, Paint Filter Liquids Test	Confirm consistency between waste and shipping documentation; determine from test results whether the preventive measures identified in WAC 173-303-395(1)(b) must be applied to manage the waste in compliance with permit conditions.
pH	Field pH screen (pH paper method)	Confirm consistency between waste and shipping documentation; determine from test results whether the preventive measures identified in WAC 173-303-395(1)(b) must be applied to manage the waste in compliance with permit conditions.
Oxidizer	Field potassium iodide test paper	Confirm consistency between waste and shipping documentation; determine from test results whether the preventive measures identified in WAC 173-303-395(1)(b) must be applied to manage the waste in compliance with permit conditions.
Water reactivity	Field water mix screen	Confirm consistency between waste and shipping documentation; determine from test

Table B. 1 Parameters and Rationale for Physical and Chemical Screening

Parameter	Method ^a	Rationale for Selection
		results whether the preventive measures identified in WAC 173-303-395(1)(b) must be applied to manage the waste in compliance with permit conditions.
Cyanides	Field cyanide screen	Confirm consistency between waste and shipping documentation; determine from test results whether the preventive measures identified in WAC 173-303-395(1)(b) must be applied to manage the waste in compliance with permit conditions.
Sulfides	Field sulfide screen	Confirm consistency between waste and shipping documentation; determine from test results whether the preventive measures identified in WAC 173-303-395(1)(b) must be applied to manage the waste in compliance with permit conditions.
Halogenated Organic Carbons	Screening test method for PCBs in transformer oil (SW-846, Method 9079)	Confirm consistency between waste and shipping documentation; determine from test results whether the preventive measures identified in WAC 173-303-395(1)(b) must be applied to manage the waste in compliance with permit conditions.

^a Processes based on manufacturer's recommended methodology for test kit or testing equipment, unless otherwise noted. When regulations require a specific method, the method will be followed.

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B.3.1 Physical Screening Parameters

The following methods are approved for use in performing physical screening.

(1) Visual inspection (preferred method for physical screening):

Rationale. This method meets the requirement to ensure consistency between waste containers and the accompanying waste stream documentation.

Method: The container is opened and the contents are removed as needed for visual examination. Homogenous loose solids are probed to determine the presence of material not documented on the waste stream documentation, or for improperly absorbed liquids. Visual observations are compared with the applicable profile information and the container specific information in the waste stream documentation.

Failure criteria: A container fails inspection for any of the following reasons; (a) undocumented, improperly packaged, or inadequately absorbed liquids; (b) discovery of prohibited articles or materials listed in Section 1.2; (c) discovery of material not consistent with the applicable waste stream documentation; and (d) variability greater than 25 percent by volume in listed constituents (e.g., paper, plastic, cloth, and metal).

(2) NDE:

Rationale. This method meets the requirement to ensure consistency between waste containers and the accompanying waste stream documentation. This method also is subject to the QA requirements listed in Section B.2.1.3.3.1. Containers that are not easily amenable to visual inspection because of physical or radiological content, or unit availability can be examined safely and economically.

1 **Method:** The container is scanned with a NDE system. Data are observed on a video monitor and
2 captured and recorded. Personnel experienced with the interpretation of NDE imagery record their
3 observations. These observations are compared to the contents listed on the waste stream
4 documentation.

5 **Failure criteria:** A container fails the inspection for any of the following reasons;
6 (a) undocumented, improperly packaged, or inadequately absorbed liquids; (b) discovery of
7 prohibited articles listed in Section B.1.2; (c) image data not consistent with the applicable waste
8 stream documentation; and (d) variability greater than 25 percent by volume in listed constituents
9 (e.g., paper, plastic, cloth, and metal).

10 **B.3.2 Chemical Screening Parameters**

11 The following methods are approved for use in performing chemical screening tests. Chemical screening
12 is used to verify that incoming waste is consistent with waste stream documentation. Failure of a
13 chemical screening test is defined as a chemical screening result that is inconsistent with the associated
14 waste stream documentation.

15 (1) Ignitability and/or headspace volatile organic compound screening:

16 **Rationale:** To determine the potential ignitability and the presence or absence of volatile organic
17 compounds in waste and to alert personnel to potential hazards. These methods are used when
18 containers are opened for inspection. These methods can be applied to any matrix.

19 **Methods:** A sample of the headspace gases in a container is analyzed by one or more of the
20 following types of portable instrumentation: organic vapor monitor, colorimetric gas sampling tubes,
21 or a lower explosive level meter.

22 **Failure criteria:** High organic vapor readings in matrices not documented or detected as having
23 volatile organic content constitutes failure.

24 (2) Peroxide screening:

25 **Rationale:** To determine the presence of organic peroxides in solvent liquid wastes, to alert
26 personnel to potential hazards, to ensure safe segregation and storage of incompatible wastes, and to
27 confirm consistency with the waste stream documentation. The test is sensitive to low parts per
28 million ranges.

29 **Method:** A peroxide test strip is dampened with a pipet sample of liquid waste. Solids are tested by
30 first wetting the test strip with water and contacting a small sample of the waste. A blue color change
31 indicates a positive reaction. The color change can be compared with a chart on the packaging to
32 determine an approximate organic peroxide concentration.

33 **Failure criteria:** Peroxide concentrations greater than 20 parts per million in liquid waste
34 constituents that are known organic peroxide formers not documented as having been stabilized
35 constitutes failure. Results that are not consistent with documented constituents fail verification.

36 (3) Paint filter liquids test:

37 **Rationale:** To verify the presence or absence of free liquid in solid or semisolid material.

38 **Method:** To a standard paint filter, 100 cubic centimeters or 100 grams of waste are added and
39 allowed to settle for 5 minutes. Any liquid passing through the filter signifies failure of the test. The
40 required method for the paint filter liquids test is method 9095 in the U.S. Environmental Protection
41 Agency (EPA), SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (the
42 most recently promulgated version) (EPA 2004).

1 **Failure criteria:** Failure of the test in waste matrices not documented as having free liquids
2 constitutes failure of the container. Small quantities of condensate trapped in inner plastic liner folds
3 are acceptable.

4 (4) pH screen:

5 **Rationale:** To identify the pH and corrosive nature of an aqueous or solid waste, to ensure safe
6 segregation and storage of incompatible waste, and to confirm consistency with the waste stream
7 documentation.

8 **Method:** Field verification of pH measurement is performed using pH test paper.

9 **Failure criteria:** If the pH of a matrix exceeds regulatory limits (less than or equal to 2.0 or greater
10 than or equal to 12.5) in waste not documented as being regulated for this property, or the measured
11 pH is inconsistent with the waste container documentation, the container fails verification.

12 (5) Oxidizer screen:

13 **Rationale:** To determine if a waste exhibits oxidizing properties, to ensure safe segregation and
14 storage of incompatible waste, and to confirm consistency with the waste stream documentation.
15 This test can be applied to waste liquids, solids, and semisolids.

16 **Method:** 1 or 2 drops of 3N HCl acid is added to the Oxidizer test paper (potassium iodide, starch).
17 The test paper is touched to a pea size sample of the waste to be tested. A black, blue/black, or purple
18 color change determines a positive oxidizer test.

19 **Failure criteria:** A positive indication in a waste that is not consistent with documented constituents
20 fails verification.

21 (6) Water reactivity screen:

22 **Rationale:** To determine if the waste has the potential to vigorously react with water to form gases
23 or other reaction products. This information is used to ensure safe segregation and storage of
24 incompatible waste, and to confirm consistency with the waste stream documentation.

25 **Method:** 2 or 3 drops of distilled water is added to an oxidizer test paper strip. The test paper is
26 touched to a pea size sample of the waste to be tested. The observance of effervescence, a violent
27 reaction, flaming or boiling indicates a positive test.

28 **Failure criteria:** A positive or negative indication in a waste that is not consistent with documented
29 constituents fails verification.

30 (7) Cyanide screen:

31 **Rationale:** To indicate if waste could release hydrogen cyanide on acidification near pH 2.
32 This information is used to ensure safe segregation and storage of incompatible waste and to confirm
33 consistency with the waste stream documentation.

34 **Method:** A pea size sample of the waste to be tested is dissolved in a small quantity of water.
35 A mixture of ferrous ammonium sulfate and ferrous ammonium citrate is added to the stoppered test
36 tube. The sample is then shaken and 3N HCl is added to the solution. A dark Prussian blue color
37 change indicates the presence of the acid.

38 **Failure criteria:** A positive or negative indication in a waste that is inconsistent with documented
39 constituents fails verification.

40 (8) Sulfide screen:

Rationale: To indicate if the waste could release hydrogen sulfide on acidification near pH 2. This information is used to ensure safe segregation and storage of incompatible wastes and to confirm consistency with the waste stream documentation.

Method: 5 drops of 3N HCl acid is added to a pea size sample of the waste to be tested. Lead acetate test paper is touched to the sample. A brown or black color change of paper indicates a positive test.

Failure criteria: A positive or negative indication in a waste that is inconsistent with documented constituents fails verification.

(9) Halogenated Organic Carbons screen:

Rationale: To indicate whether PCBs or other chlorinated solvents are present in the waste. This information is used to confirm consistency with the waste stream documentation and to determine if additional information/data are needed to properly store and treat the waste.

Methods: Field organic chlorine tests appropriate to the matrix, such as those offered by the Dexsil Corporation (e.g., Chlor-N-Oil, Chlor-N-Soil), are used. These screening tests are available with several detection limits that enable the verification to be performed in the concentration range applicable to the proposed management path of the waste.

Failure criteria: A positive or negative indication of chlorinated organic compounds in a waste that is inconsistent with documented constituents as having chlorinated organic compounds content constitutes failure.

B.3.3 Analysis Parameters and Methods

Parameters needed to meet designation, characterization, and LDR requirements and associated analytical methods for dangerous and/or mixed waste stored and/or treated at the WRAP Operating Unit Group are identified in Table B.2.

The most recent promulgated revision of SW-846 will be used for the EPA methods.

In determining the characteristic of ignitability, either the Pensky-Martens (EPA Method 1010) or the Setaflash (EPA Method 1020), must be used when testing. The characteristic of corrosivity also requires specific EPA test methods. When testing the pH of a given waste stream, EPA Method 9040 or EPA Method 9045 must be used in accordance with WAC 173-303-090(6).

Compliance with LDR for dangerous and/or mixed waste that have a treatment standard expressed as constituent concentrations in waste (CCW) [40 CFR 268.40, incorporated by reference into WAC 173-303-140] may be shown using the appropriate method in Table B.2. When the waste treatment standard is expressed as constituent concentrations in waste extracts (CCWE) [40 CFR 268.40, incorporated by reference into WAC 173-303-140], then the Toxicity Characteristic Leaching Procedure (TCLP) EPA Method 1311, which is referenced in 40 CFR 268.41(a), must be performed. Following the extraction procedure (EPA Method 1311), the appropriate EPA determinative method in Table B.2 will be used. Both cyanide test parameters (total and amenable) for non-waste waters will be analyzed using EPA Method 9012, 9014, 9213, or SM 4500-CN^b. Uniform Hazardous Constituents (UHCs) will be evaluated, as required by 40 CFR 268.48.

Table B.2 Analytical Parameters, Methods, and Rationale for WRAP

Parameter	Analytical method ^a	Matrix type	Rationale for Analysis
Flashpoint	1010, 1020	Liquid	To determine regulatory status as D001 waste, to provide proper waste designation and to identify applicable LDR treatment standards.

Table B.2 Analytical Parameters, Methods, and Rationale for WRAP

Parameter		Analytical method ^a	Matrix type	Rationale for Analysis
pH	Liquid	9040, SM 4500H ⁺ B ^b	Liquid, sludge	To determine regulatory status as D002/WSC2 waste, to provide proper waste designation and to identify applicable LDR treatment standards.
	Solid	9045	Solid	
Free liquids		9095	Liquid, sludge, solid	Identify applicable LDR treatment standards.
Cyanide		9012, 9014, 9213, SM 4500 CN ^b	Liquid, sludge, solid	To determine regulatory status as D003 waste, to provide proper waste designation and to identify applicable LDR treatment standards.
Sulfide		9030	Liquid, sludge, solid	To determine regulatory status as D003 waste, to provide proper waste designation and identify applicable LDR treatment standards.
PCBs		8082	Liquid, sludge, solid	To determine regulatory status as WPCB waste, to provide proper waste designation and to determine if the waste is subject to LDR treatment standards.
Total organic carbon		9060	Liquid, sludge, solid	To provide proper waste designation and applicability to state-only requirements, and to determine if the waste is subject to LDR treatment standards.
Persistent constituents: HOC [WAC 173-303-040]		9076	Oil	To determine regulatory status as WP01/WP02 waste, to provide proper waste designation and applicability to state-only requirements.
		9020,9021,9022 8260 ^d ; 8270 ^d	Liquid, sludge, solid	
Persistent constituents: PAH		8270		
Total suspended solids		SM 2540D ^b	Liquid, sludge	To provide applicability of LDR requirements and status as a wastewater.
Volatile organic compounds ^d		1311/8260	Liquid, sludge, solid	To determine proper waste designation, regulatory status, and applicability of LDR requirements.
Semi volatile organic compounds ^d		1311/8270	Liquid, sludge, solid	To determine proper waste designation, regulatory status, and applicability of LDR requirements.

Table B.2 Analytical Parameters, Methods, and Rationale for WRAP

Parameter	Analytical method ^a	Matrix type	Rationale for Analysis
Chlorinated herbicides	1311/8151	Liquid, sludge, solid	To determine proper waste designation, regulatory status, and applicability of LDR requirements.
Arsenic ^d	1311/6010, 200.8 ^c	Liquid, sludge, solid	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Barium ^d	1311/6010, 200.8 ^c	Liquid, sludge, solid	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Cadmium ^d	1311/6010, 200.8 ^c	Liquid, sludge, solid	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Chromium ^d	1311/6010, 200.8 ^c	Liquid, sludge, solid	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Lead ^d	1311/6010, 200.8 ^c	Liquid, sludge, solid	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Mercury ^d	1311/7470, 7471, 7473, 200.8 ^c	Liquid, sludge, solid	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Selenium ^d	6010, 200.8 ^c	Liquid, sludge, solid	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Antimony ^d	6010, 200.8 ^c	Liquid, sludge, solid	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Beryllium ^d	6010, 200.8 ^c	Liquid, sludge, solid	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Nickel ^d	6010, 200.8 ^c	Liquid, sludge, solid	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Thallium ^d	6010, 200.8 ^c	Liquid, sludge, solid	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.

1 ^a Procedures based on EPA SW-846, unless otherwise noted. When regulations require a specific method, the
2 method will be followed.

3 ^b EPA-600/4-79/020 (EPA 1983), unless otherwise noted.

4 LDR = land disposal restriction.

5 PCB = polychlorinated biphenyls.

6 TSCA = *Toxic Substances Control Act of 1976*

1 **B.4 SELECTING SAMPLING PROCESSES**

2 Specific sampling procedures and techniques depend on both the nature of the material and the type of
3 packaging. Waste samples will be handled and preserved as necessary to protect the sample. For
4 treatment, preservation techniques, and holding times the WRAP Operating Unit Group personnel or
5 authorized delegate will utilize the procedures and techniques recommended in SW-846. This section
6 describes the sampling methodology used to obtain representative samples. DQOs have been established
7 in accordance with TPA Action Plan Section 6.5.

8 **B.4.1 Sampling Strategies**

9 Table B.3 contains waste forms and sample equipment used to sample the referenced waste. Sampling of
10 these waste forms will be performed in accordance with Table B.3.

11 **B.4.2 Sampling Methods**

12 The basic sampling sequence includes the following:

- 13 • Obtain a unique sample number and complete the sample tag before sampling
- 14 • Obtain a pre-cleaned sampler and sample bottles
- 15 • Attach sample label to sample bottles
- 16 • For sampling liquid waste, use a sampler or pipet to sample for two-phase liquids. Homogeneous
17 liquids in small containers will be poured into a sample bottle
- 18 • For sampling solid waste, use a scoop, trier, or hand auger to obtain a sample of the waste. For
19 large containers of waste, composite several augers or scoops to ensure samples are representative
- 20 • Fill sample containers in the following sequence: volatile organics, pH (corrosivity), , ignitability,
21 semivolatile organics, metals
- 22 • For solid waste, wipe the exterior surfaces of the sample bottles with a dry rag
- 23 • Attach sample labels to outer plastic bags
- 24 • Place samples in an appropriate receptacle for transfer to the laboratory
- 25 • Complete the chain-of-custody records and comply with chain-of-custody procedures
- 26 • Seal and mark the receptacle in accordance with WAC 173-303-071(3)(1)
- 27 • Transfer receptacle to the analytical laboratory, as appropriate to meet sample holding times
- 28 • Properly clean and decontaminate non-disposable sampling equipment or package for return to
29 central sampling equipment decontamination area according to onsite requirements.

30 **B.4.3 Selecting Sampling Equipment**

31 Sampling equipment selection is detailed in Table B.3. Sampling equipment needed to sample waste will
32 be maintained and decontaminated as necessary to ensure representative samples according to SW-846.

Table B. 3 WRAP Sampling Equipment

Waste form	SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Test Methods, Section B.9., References	
	Waste type	Equipment*
Liquids	Free-flowing liquids and slurries	COLIWASA, glass thief, pipe; dip, tank bomb, and bailer samplers; and tube-type samplers

Solidified liquids	Sludges	Trier, scoops and shovels; tube-type samplers and augers; for small containers, a spoon may be used in place of a scoop
Sludges	Sludges	Trier, scoops and shovels; tube-type samplers and augers; for small containers, a spoon may be used in place of a scoop
Soils	Sand or packed powders and granules	Auger, scoops and shovels; tube-type samplers and augers; for small containers, a spoon may be used in place of a scoop
Absorbents	Large-grained solids	Large trier, scoops and shovels
Wet absorbents	Moist powders or granules	Trier, scoops and shovels
Process solids and salts	Moist powders or granules	Trier, scoops and shovels
	Dry powders or granules	Trier, scoops and shovels
	Sand or packed powders and granules	Auger, scoops and shovels
	Large-grained solids	Large trier, scoops and shovels
Ion exchange resins	Moist powders or granules	Trier, scoops and shovels
	Dry powders or granules	Trier, scoops and shovels
	Sand or packed powders and granules	Auger, scoops and shovels

1 COLIWASA = composite liquid waste sampler.

2 * other ASTM-approved equipment could be used to collect samples.

3

4 **B.4.4 Sample Preservation**

5 Sample preservation will follow SW-846 protocol.

6 **B.4.5 Establishing Quality Assurance and Quality Control for Sampling**

7 This WAP incorporates the requirements of Attachment 7. Sample collectors prepare a permanent log of
8 sampling activities in accordance with SW-846. Records will be maintained in accordance with
9 Section B.8., Recordkeeping. Log entries include: date of collection, time of collection, location, batch
10 number, sample number, tank number (if applicable), copy of the chain-of-custody form, sampling
11 methodology, container description, waste matrix (liquid), description of generating process
12 (e.g., decontamination activities), number and volume of samples, field observations, field measurements
13 (e.g., pH, percent lower explosive limit), laboratory destination and laboratory number, and signature.
14 These log entries will be made by trained personnel while the sampling is performed. The logs or copies
15 of logs will be maintained in accordance with Section B.8., Recordkeeping.

16 Chain-of-custody records accompany samples at all times. The WRAP Operating Unit Group will
17 maintain and follow written hard copy or electronic chain-of-custody processes to ensure accountability
18 of waste sample handling and to guarantee sample integrity. All samples will be labeled with a unique
19 identifier.

1 During all sampling activities, strict compliance with applicable industrial hygiene and safety standards
2 will be mandatory. The WRAP Operating Unit Group maintains sampling and decontamination
3 processes to ensure that industrial hygiene and safety standards will be met.

4 The following QA/QC elements will be used by the WRAP Operating Unit Group to ensure sampling
5 activities for designation purposes result in acceptable laboratory data:

- 6 • Representative sampling methods as defined by SW-846
- 7 • Approved sample containers and sampling equipment per SW-846
- 8 • Samples numbered
- 9 • Traceable labeling system
- 10 • Field QA/QC samples (per applicable SAP)
- 11 • Documentation of equipment calibration per equipment manufacturer specifications
- 12 • Chain-of-custody records and corresponding chain-of-custody procedures.

13 **B.5 LABORATORY SELECTION AND QUALITY ASSURANCE/QUALITY CONTROL**

14 The selection of any laboratory will be based on the ability of the laboratory to demonstrate compliance to
15 this section with experience and capability in the following major categories:

- 16 • Comprehensive written QA/QC program
- 17 • Technical analytical expertise
- 18 • Effective information management systems.

19 The QA and QC requirements outlined in this section will be applicable to laboratory activities governed
20 by this WAP.

21 **B.5.1 Evaluation of Laboratories**

22 All laboratories providing analytical support to the WRAP Operating Unit Group will be required to have
23 a current, laboratory approved QA plan. The laboratory QA plan will be submitted to the WRAP
24 Operating Unit Group, and to Ecology in accordance with TPA Action Plan Section 6.5, for review as a
25 secondary document before commencement of analytical work. The QA plan will, at a minimum, address
26 the following elements:

- 27 • Sample custody and management practices (also refer to Section B.4.)
- 28 • Sample preservation protocols
- 29 • Sample preparation and analytical method requirements
- 30 • Instrument maintenance and calibration requirements
- 31 • Internal QC measures, e.g., method blanks, spikes, duplicates
- 32 • Corrective action process.

33 Each laboratory will be audited periodically by an independent organization to evaluate the effective
34 implementation of the laboratory's QA/QC program. QA personnel and technical expert evaluate the
35 laboratory through onsite observations and/or reviews of the following documentation: copies of the
36 QA/QC documents; records of surveillances/inspections; audits; non-conformances, and corrective
37 actions. The WRAP Operating Unit Group will ensure independent organizations; QA personnel and
38 technical experts are qualified to perform these evaluations.

39 **B.5.2 Quality Assurance/Quality Control Objectives**

40 The overriding goal of the analytical program will be to support the accurate designation of waste and/or
41 demonstrate compliance to LDR standards. The certified laboratory QA/QC programs will be designed to
42 meet the following objectives.

- 1 • Minimize errors. Errors may be introduced during preparative, analytical, and/or reporting
2 phases of work. QC program elements include analyses of samples in accordance with
3 established methods.
- 4 • Provide information. The designation of waste relies on a combination of Knowledge, historical
5 data and additional analytical data. Laboratory QA/QC programs ensure accurate, precise,
6 reliable, and reproducible data.

7 Key QA program elements will be designed to provide objective evidence that waste analysis methods
8 meet the performance specifications of the WRAP Operating Unit Group. QA activities and
9 implementation responsibilities are as follows:

- 10 • Activity based laboratory inspections. Inspections will be performed to verify that specific
11 guidelines, specifications, and procedures for the activities are completed successfully.
- 12 • Laboratory analyses. Analyses will be performed by onsite or offsite laboratories on samples of
13 waste using written and approved methods.
- 14 • Development of inspection checklists. Checklists are required for laboratory inspections and will
15 be designed to ensure that the inspected activity is consistently addressed. Checklists will be
16 completed during the inspection to document results.
- 17 • Instrument calibration and calibration verification. These activities will be performed by the
18 laboratory and are required for ensuring data of known accuracy and precision. Calibration data
19 will be maintained and stored to ensure traceability to reported results.
- 20 • Laboratory QA/QC inspection results and instrumental calibrations will be documented in
21 accordance with Section B.8, Recordkeeping.

22 **B.5.3 Laboratory Quality Assurance/Quality Control**

23 All analytical work will be defined and controlled by a statement of work, work order, or other work
24 authorizing document. These work authorization documents will include QA/QC performance
25 requirements. Samples will be handled according to controlled laboratory procedures. The accuracy,
26 precision, and limitations of the analytical data will be evaluated through QC performance.

27 As needed, the WRAP operating organization will conduct evaluations to determine completeness of
28 information and whether waste meets the acceptance criteria for treatment, storage, or disposal at one of
29 the Hanford Facility Operating Unit Groups or those of a chosen offsite TSD facility. Testing and
30 analytical methods will depend on the type of analyses sought. For parameters or methods not otherwise
31 specified in Section B.3., the most current revisions of the following are acceptable sources of testing
32 methods.

- 33 • Analytical methods cited in WAC 173-303;
- 34 • The most recently promulgated version of *Test Method for Evaluating Solid Waste: Physical/
35 Chemical Methods*, SW-846, U.S. Environmental Protection Agency, EPA, Office of Solid
36 Waste;
- 37 • Other current U.S. EPA methods, as applicable to the matrix under evaluation;
- 38 • *Standard Methods for the Examination of Water and Wastewater*, American Public Health
39 Association (APHA), American Water Works Association, Water Environment Federation;
- 40 • *Annual Book of ASTM Standards*, American Society for Testing and Materials;
- 41 • *AOAC Official Methods of Analysis*, AOAC (Association of Official Analytical Chemists),
42 International.
- 43 • SW-846 methods modified to meet ALARA concerns may be performed subject to Ecology
44 approval.

1 **B.5.4 Data Assessment**

2 Data used for decision making need to be scientifically sound, of known quality, and thoroughly
3 documented in the Hanford Facility Operating Record, WRAP file. The WRAP is responsible for the
4 quality of the data and project usability. Data are assessed to determine compliance with quality
5 standards and established by this Permit are as follows:

6 Precision – Precision represents a measure of the reproducibility of measurements under prescribed similar
7 conditions. Sample precision is calculated on the basis of duplicate analyses. Acceptance criteria shall be
8 established for each analyte and each analyte method, and shall be agreed on by the laboratory and the
9 client. Accuracy – Accuracy represents the degree to which a measurement agrees with an accepted
10 reference or true value. Sample accuracy is expressed as the percent recovery of a spiked sample.
11 Acceptance criteria shall be established for each analyte and each analyte method, and shall be agreed on
12 by the laboratory and the client.

13 Representativeness – Representativeness is the degree to which data accurately and precisely represents a
14 characteristic of a population, a parameter variation at a sampling point, a process condition, or an
15 environmental condition. Representativeness of a population or an environmental condition depends
16 heavily on sampling and is addressed in other documents. The issue of representativeness is addressed
17 for the following points:

- 18 • Based on the generating process, the waste stream, and its volume, that an adequate number of
19 sampling locations are selected;
- 20 • The representativeness of selected media has been defined accurately;
- 21 • The sampling and analytical methodologies as defined in this WAP Tables B.1, B.2, and B.3
- 22 • The environmental conditions at the time of sampling are documented in accordance with Section
23 B.8, Recordkeeping.

24 Completeness – Completeness is a measure of the amount of usable and/or valid data obtained from a
25 measurement system compared to the total amount of data requested. Completeness can be used to
26 evaluate the amount of data produced that meets the client’s requirements (e.g., accuracy, precision). In
27 some cases, data may not meet all the requirements, but may still be used for qualitative information as an
28 indicator of the presence or absence of a parameter.

29 Comparability – Comparability is the confidence with which one data set can be compared to another.
30 For each analyte, comparable precision and accuracy depend on the method and the sample matrix. To be
31 comparable, similar precision, accuracy, and method detection limits shall be achieved on samples with
32 similar matrices using similar analytical methods. Factors such as the analytical method selected, method
33 detection limits or uncertainty, precision, accuracy, and matrix effects must be considered in the decision
34 making process when data sets from multiple laboratories is to be compared.

35 **B.6 SELECTING WASTE RE-EVALUATION FREQUENCIES**

36 The waste profile and supporting data and documentation will be re-evaluated at least annually, or
37 whenever the generator has informed the WRAP Operating Unit Group of a change in the waste
38 generation process, or if waste received at the WRAP Operating Unit Group or the description on the
39 shipping documentation does not match the waste profile. If the generator has informed the WRAP
40 Operating Unit Group of a change in the waste generation process, the waste re-enters the waste stream
41 approval process described in Section B.2.1.1. The WRAP Operating Unit Group will evaluate waste
42 receipt verification data against the waste profile to identify any waste streams for which a change in the
43 waste generation process is suspect. When a waste stream is suspect, that waste stream will re-enter the
44 approval process described in Section B.2.1.1.

45 When a waste profile is re-evaluated, the WRAP operating organization may request the generator to do
46 one or more of the following:

- 1 • Verify accuracy of the current waste profile;
- 2 • Supply a new waste profile;
- 3 • Submit a sample for laboratory analytical chemical analysis to confirm that the waste is still
- 4 within the profile parameters.
- 5 • Document the nature of any generating process changes with respect to dangerous waste listing
- 6 definitions.

7 **B.7 SPECIAL WASTE ANALYSIS PROCEDURAL REQUIREMENTS**

8 This section discusses special process requirements for receiving dangerous and/or mixed waste at the
9 WRAP Operating Unit Group.

10 **B.7.1 Processes for Receiving Onsite Waste and Offsite Waste**

11 The processes for receiving waste are described in Section 2. In general, mixed waste received from
12 onsite generators is managed the same as waste received from offsite generators. Differences include, but
13 are not limited to the following: (1) physical/chemical screening frequencies for verification [minimum
14 percentages of 5 percent for waste from onsite generators and 10 percent for waste from offsite generators
15 (note that chemical screening frequency depends on the physical screening frequency)], (2) shipping
16 documentation (Uniform Hazardous Waste Manifests are used for waste from offsite generators and
17 shipping documents are used for waste from onsite generators), and (3) LDR documentation requirements
18 for mixed or dangerous waste (notification for waste from offsite generators and equivalent information
19 from onsite generators).

20 **B.7.2 Processes for Ignitable, Reactive, and Incompatible Waste**

21 The WRAP Operating Unit Group accepts ignitable, reactive, or incompatible waste (refer to Section
22 B.1.2). Pre-shipment review and/or chemical screening requirements in Section B.2 will be used to
23 identify whether the waste is ignitable, reactive, or incompatible. The WRAP dangerous waste
24 management unit's waste acceptance criteria identifies certain management requirements for ignitable,
25 reactive, and incompatible waste, ensuring the waste will be stored in a safe manner.

26 Appropriate precautions will be taken when ignitable, reactive, or incompatible waste is stored within the
27 WRAP Operating Unit Group in accordance with Addendum C, Processes. Treatment and storage of
28 ignitable, reactive, or incompatible waste within the WRAP Operating Unit Group will be accomplished
29 in accordance with WAC 173-303-395(1)(b) and documented in accordance with WAC 173-303-
30 395(1)(c). The annual inspection for ignitable and reactive waste is addressed in Addendum I, Inspection
31 Plan.

32 A compatibility review will be performed on wastes being considered for acceptance into the WRAP
33 Operating Unit Group: (1) during the waste acceptance process based upon waste chemical
34 characteristics, and/or (2) when additional information becomes available on waste form or waste
35 constituents. The compatibility review for the Waste Retrieval Project Waste will be performed on the
36 information contained in the Acceptable Knowledge documentation for the waste stream. If additional
37 information becomes available during the waste processing steps, the compatibility of the waste
38 container/stream will be re-evaluated.

39 The compatibility review process covers compatibility between chemicals within a waste matrix,
40 compatibility between multiple containers within a lab pack, and compatibility between a waste container
41 and the waste it contains. The storage category (hazard class) will be updated as necessary following the
42 compatibility review. The storage category will be used to ensure incompatible wastes are not stored
43 together. The chemical compatibility matrix used is consistent with approach documented in *A Method*
44 *for Determining the Compatibility of Hazardous Waste* (Hatayama *et al*, 1980)
45 (<http://www.uos.harvard.edu/ehs/environmental/EPACChemicalCompatibilityChart.pdf>).

1 The compatibility review process considers the available characterization data and waste designation.
2 The conditions against which compatibility will be measured include the following:

- 3 • Storage lasting for 20 years
- 4 • Lack of a temperature controlled environment
- 5 • Amount of material
- 6 • Stability of components and reactivity
- 7 • Consequence of inner containers breaking
- 8 • Compatibility of waste with absorbent
- 9 • Container material

10 **B.7.2.1 Provisions for Compliance with Federal and State Land Disposal Restriction** 11 **Requirements**

12 LDR requirements restrict the land disposal of certain types of waste subject to the *Hazardous Waste*
13 *Management Act of 1976*. Waste managed on the Hanford Facility falls within the purview of these
14 LDRs per 40 CFR 268, incorporated by reference by, WAC 173-303-140. Wastes that are otherwise
15 prohibited from land disposal may be land disposed of the treatment standards established by
16 WAC 173-303-140, are satisfied.

17 Generators determine what LDR treatment standards apply to the mixed and/or dangerous wastes, and
18 make an evaluation of whether or not these treatment requirements have been satisfied. For wastes
19 subject to concentration-based treatment standards, compliance with LDR treatment standards will be
20 evaluated through analysis of a representative grab sample of the waste. For those LDR constituents
21 subject to treatment for the listed and characteristic waste numbers that apply to the waste, including any
22 UHC identified by 40 CFR 268.2(i), if the Knowledge of the generator is not sufficient to make complete
23 constituent determinations. If the waste does not meet the applicable treatment standards, the generator
24 provides waste information with each shipment stating so, in accordance with WAC 173-303-380(1)(j),-
25 (k),-(l),-(m),-(n), or -(o). If the waste meets the LDR standards, the generator must send a certification
26 that the waste meets the treatment standards.

27 **B.7.2.2 Sampling and Analytical Methods**

28 It is recognized that ALARA concerns may warrant modifications to the methods to ensure appropriate
29 protection of personnel health and safety without impact to the method or sample integrity. Waste
30 analyzed using SW-846 methods modified to address ALARA protection concerns will be considered
31 acceptable provided the applicable data quality objectives specified in the modified SW-846 methods will
32 be met.

33 Samples of waste will be transferred from WRAP dangerous waste management units to an onsite
34 laboratory or shipped offsite to a laboratory for analysis. Samples are collected in accordance with
35 SW-846 and as described in Section B.4. Sample storage will be provided for waste containers while
36 awaiting laboratory analysis results.

37 **B.7.3 Waste Treatment**

38 Waste will be treated to meet LDR treatment standards applicable pursuant to WAC 173-303-140 with
39 the exception of mixed waste designated by the Secretary of Energy for disposal in the WIPP pursuant to
40 the *Land Withdrawal Act*, as amended. In addition to LDR treatment standards, wastes will be treated to
41 the applicable standards required by the offsite TSD facility.

42 The WRAP Operating Unit Group may partially treat or pre-treat certain waste before shipment to a
43 permitted offsite TSD facility that can perform full treatment of the specific waste to meet LDR and any

1 other disposal – unit specific treatment requirements. Prior to treatment of the waste, the WRAP will
2 have in place procedures that ensure safe waste treatment as defined in Section B.1.1.1.2 of this WAP.

3 When characteristics of the waste change as a result of treatment or other processing, documentation of
4 the characteristic change will be in accordance with Section B.8, Recordkeeping. When evaluating the
5 treatability of certain characteristic waste, consideration must be given to any potential additional UHCs.
6 The treatment standards, for the most part, are concentration-based. When the concentration-based
7 standards are used, the constituent concentrations for the waste must fall below those specified in
8 40 CFR 268.40 and/or 268.48 for UHCs incorporated by reference by WAC 173-303-140. For waste
9 subject to state-only LDR requirements, the waste must meet the treatment standards in
10 WAC 173-303-140 for land disposal without treatment. When the concentrations exceed these limits, the
11 waste must be treated before disposal. The alternative treatment standards for hazardous debris as
12 specified in 40 CFR 268.45 or for contaminated soil as specified in 40 CFR 268.49, as established in a
13 site-specific treatability variance pursuant to 40 CFR 268.44 (h), or for labpacks in 40 CFR 268.42(c) all
14 incorporated by reference by WAC 173-303-140 could also be used.

15 Specific treatments performed in the WRAP will include solidification or absorption of liquids,
16 neutralization of corrosives, amalgamation, microencapsulation, macro-encapsulation, volume reduction
17 of waste, deactivation, sorting, and repackaging of waste.

18 Deactivation will be used to remove the hazardous characteristics of the waste due to its ignitability
19 (D001), corrosivity (D002), solid corrosive acid (WSC2), and/or reactivity (D003). Treatment techniques
20 will include neutralization, absorption, cementing, and controlled reaction with water

- 21 • Neutralization will be the primary method of treatment for corrosive waste that has a pH less than
22 or equal to 2 and/or greater than or equal to 12.5.
- 23 • Cementing or grouting will be the primary method of treatment for ignitables consisting of metal
24 fines. These types of waste are deactivated by mixing and binding it with an inert cementitious
25 material.
- 26 • Encapsulation will be a treatment for debris. Either macroencapsulation or microencapsulation
27 may be performed on debris in glove boxes to meet treatment standards.
- 28 • Absorption will be the primary method of treatment for ignitable waste, which includes waste that
29 is liquid and has low total organic carbon content (less than 10 percent).

30 Stabilization methods used by the WRAP operating organization include cementing or grouting, sealing,
31 and absorption. Particulates and/or liquid waste containing hazardous constituents will be cemented or
32 grouted at the WRAP to meet its waste acceptance criteria. These types of waste will be stabilized by
33 mixing and binding the waste with an inert material. When dealing with some waste streams, such as
34 sludges that may contain an inconsistent or excess liquid content, absorbent will be added to the waste to
35 provide a drier matrix allowing identification of the proper combination of ingredients to ensure a
36 successful stabilization effort.

37 Amalgamation of liquid, elemental mercury (D009) will be achieved using inorganic reagents such as
38 powdered copper, zinc, nickel, gold, or sulfur. The resultant matrix is a non-liquid, solid, or semi-solid
39 visually inspected to verify compliance.

40 Treatment of state-only extremely hazardous waste (WT01, WP01, and WP03) will be performed in
41 accordance with Revised Code of Washington (RCW) 70.105.050(2) for mixed waste, and/or
42 WAC 173-303-140(4)(a) for dangerous waste.

43 Waste managed at one or more of the WRAP dangerous waste management units will be treated to meet
44 either concentration-based treatment standards or technology-based standards. The alternative treatment
45 standards for hazardous debris as specified in 40 CFR 268.45 or for contaminated soil as specified in
46 40 CFR 268.49 may also be used. When dealing with multiple dangerous waste numbers, all treatment

1 standards may apply, requiring a treatment train for ultimate compliance to LDR. In some instances, as
2 with the cementing process, treatability studies may be performed to ensure that when the waste is treated,
3 LDR requirements will be met.

4 Representative samples will be collected on each batch of concentration-based treated waste to ensure that
5 the treatment process was successful. For specified technologies, the WRAP operating organization will
6 document in accordance to Section B.8., Recordkeeping information that demonstrates that the treatment
7 was well designed and executed.

8 **B.7.4 Land Disposal Restriction Certification of Treatment**

9 When LDR treatment has been completed and analytical results expressed as constituent concentration
10 has been verified as compliant with the LDR treatment standards, certification of the LDR treatment will
11 be prepared by WRAP operating organization. The certification statement will be prepared in accordance
12 with 40 CFR 268.7(b, d, and e). A copy of the certification will be placed in the WRAP operating record
13 in accordance with Permit Condition II. I.

14 When a prohibited waste does not meet the applicable treatment standards set forth in 40 CFR 268.40
15 incorporated by reference by WAC 173-303-140, this information will be placed in the WRAP operating
16 record, in accordance with WAC 173-303-380(1) (k), (n), and (o) facility recordkeeping.

17 **B.8 RECORDKEEPING**

18 Recordkeeping requirements applicable to this addendum are described as follows:

- 19 a. Confirmation records described in Section B.2 will be maintained in accordance with
20 Condition II.I.1 and Condition II.I.5.c of the *Hanford Dangerous Waste Permit*.
- 21 b. Waste information documentation described in Section B.2 will be maintained in accordance with
22 Condition II.I.1 and Condition II.I.5.c of the *Hanford Dangerous Waste Permit*.
- 23 c. Waste sampling records and associated documentation described in Sections B.3 and B.4 will be
24 maintained in accordance with Condition II.I.1 of the *Hanford Dangerous Waste Permit*.
- 25 d. Laboratory records and associated documentation described in Section B.5 will be maintained in
26 accordance with Condition II.I.1 of the *Hanford Dangerous Waste Permit*.
- 27 e. Documentation regarding waste re-evaluation frequencies described in Section B.6 will be
28 maintained in accordance with Condition II.I.1 and Condition II.I.5.c of the *Hanford Dangerous*
29 *Waste Permit*.
- 30 f. Special waste analysis requirement documentation described in Section B.7 will be maintained in
31 accordance with Condition II.I.1.and Condition II.I.5.c of the *Hanford Dangerous Waste Permit*.

32 **B.9 REFERENCES**

33 ASNT, 2001, *Personnel Qualification and Certification in Nondestructive Testing*, SNT-TC-1A,
34 American Society for Nondestructive Testing, Columbus, Ohio.

35 Code of Federal Regulations, as revised, Office of the Federal Register National Archives and Records
36 Administration.

37 Ecology 1997, Close out of May 21, 1996 Dangerous Waste Compliance Inspection of Mis-Designated
38 Waste Received at Hanford, Washington State Department of Ecology, Richland WA, April 11, 1997
39 (Enclosure dated April 2, 1997).

40 Ecology, 2004a, Administrative Order #1671, Washington State Department of Ecology, Lacey WA,
41 September 21, 2004

42 Ecology, 2004b, Clarification on Administrative Order #1671, Washington State Department of Ecology,
43 Lacey WA, September 22, 2004

- 1 Ecology, 2004c, Clarification Administrative Order #1671, Washington State Department of Ecology,
2 Lacey WA, September 24, 2004
- 3 EPA, 1983, *Methods for Chemical Analysis of Water and Wastes*, EPA-600/4-7-020, U.S. Environmental
4 Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.
- 5 EPA, 1986, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final*
6 *Update III-B*, SW-846, as amended, Office of Solid Waste and Emergency Response, U.S. Environmental
7 Protection Agency, Washington, D.C. Available on the Internet at www.epa.gov/SW-846/main.htm.
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