Section C
Waste Analysis

Section C — Waste Analysis

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Section C — Waste Analysis
WAC 173-303-806(4)(a)(iii) ;-300

1. General Information [-300(1) – (2)]

1.1. This section presents the processes that the Bonneville Power Administration implements to confirm knowledge about dangerous waste before it is stored at the Permitted Unit to ensure it is managed properly. The Permitted Unit serves as the central storage and consolidation facility for wastes generated throughout the BPA service territory and the Ross Complex until arrangements are made for final waste disposition at permitted off-site Treatment, Storage, and Disposal Facilities (TSDFs). As such, the Permitted Unit does not routinely generate dangerous wastes.

1.2. Dangerous wastes managed at the Permitted Unit fall into one of three categories:

1.2.1. BPA-generated Identified Waste Stream (IWS) from ongoing maintenance and operations.

1.2.2. Contaminated environmental media from ongoing BPA environmental investigation and restoration activities, including spill cleanup.

1.2.3. Unique wastes generated from special practices or other infrequent activities (non-routine wastes).

1.3. This waste analysis plan is structured to describe the process and methods used at BPA generator locations to designate dangerous waste and the steps taken by the Permitted Unit to verify the waste once it is received for storage:

- Section 2 describes the dangerous waste managed at the Permitted Unit to set the stage for the appropriate generator-provided analysis and the Permitted Unit verification procedures.
- Sections 3 and 4 outline the procedures completed by the generator to characterize and designate dangerous waste and to complete Chemical Waste Profiles. Section 4 lists all the known identified dangerous waste streams.
- Sections 5 through 7 describe the management of acceptable dangerous waste and specify how and at what frequency representative sampling must be performed.
- Section 8 describes the process and methods used at the Permitted Unit to verify dangerous waste when it is received.

1.4. Waste analysis and verification records must be maintained in the Permitted Unit operating record to demonstrate when analytical testing or generator knowledge was used to complete the waste determination.

2. Dangerous Waste Managed at the Permitted Unit

2.1. The federal and state-only dangerous waste codes listed in Section XIV of the Resource Conservation and Recovery Act (RCRA) Part A application are permissible for receipt and storage at the Permitted Unit. The primary Environmental Protection Agency (EPA)/Washington Department of Ecology (Ecology) waste code designations for wastes managed at the Permitted Unit are listed in Table C-1. The listing sequence is based on estimated annual quantities cited in Part A of the permit application (in decreasing order).

2.2. In many cases, containerized waste may bear multiple waste codes, depending on the individual characteristics of the waste.

2.3. The Permitted Unit will not accept dangerous waste that is not specified in Part A of this application. In addition, there are waste streams prohibited even if they have waste codes listed in Part A. See Section 8.2.8 for waste rejection procedures. For example, the following wastes are prohibited at BPA:

- Radioactive waste unless it is a part of licensed devices, such as smoke detectors, exempt from Washington Department of Health licensing for mixed waste management.
- Reactive waste – defined in WAC 173-303-090(7)(a)(vi), (vii) and (viii), such as Class A and Class B explosives.
- Infectious waste, such as biomedical waste as defined in 40 CFR 60.51c and referenced in WAC 173-303-555.

3. Rationale and Parameters for Each Dangerous Waste [-300(5)(a)]

3.1. Waste Stream Profiling Process and Rationale

3.1.1. BPA operations and maintenance crews are required to follow standard operating procedures. Consequently, this results in the generation of waste streams from a specific waste generating process that are substantially equivalent across BPA's operating area and between BPA generator locations. Due to the comparable nature of BPA's waste streams for a specific generating process between generator locations, BPA uses a combination of multi-user profiles and location specific profiles.

3.1.2. The backbone of the multi-user profile process is BPA's Identified Waste Stream Handbook. The IWS Handbook is a comprehensive compilation of routinely generated "identified waste streams" that are common to all BPA generator locations. It includes Chemical Waste Profiles for the IWSs that are dangerous waste (dangerous IWS). The profiles are designed to take into account minor variability between generator locations. Multi-user profiles are a small portion of the dangerous waste accepted by the Permitted Unit. The multi-user profiles listed in the IWS Handbook at the time of this permit application are presented in Table C-2.

3.1.3. A majority of dangerous IWSs are routinely generated at a single, specific generator location, and therefore have a chemical waste stream profile specific to that location

that is not relied on by other locations. The location-specific profiles in place at the time of this permit application are listed in Table C-2.

3.1.4. If BPA generators use the multi-user profiles represented in the IWS Handbook, they are required to make a knowledge-based determination that the waste they have generated is from a specific generating process and "fits" the profile and waste description. If a waste fits the description, the profile in the IWS Handbook is applied and no further characterization is required by the generator. If the BPA generator determines through knowledge that its waste does not fit an existing profile in the IWS Handbook, then the waste must be considered non-routine waste. Non-routine waste streams and contaminated environmental media must be profiled individually by each generator location at the time they are determined to be a waste.

3.1.5. Several example profiles from the IWS Handbook are provided in Attachment C-1. (Note, Attachment C-1 is not incorporated into the dangerous waste permit. However, a current version of the IWS Handbook must be kept in the facility operating record.)

3.1.6. BPA provides IWS Handbook training in conjunction with Basic Waste Management training to ensure proper use of the multi-user profiles process (see Section H, Personnel Training).

3.1.7. BPA generator locations are required to furnish all dangerous waste designation information, including additional information pertaining to applicable land disposal restrictions (LDRs) that may apply once the material is transported from the Permitted Unit to an off-site permitted TSDF for final disposition. As noted, this information must be provided on the Chemical Waste Profile. In addition, information about chemical and physical waste incompatibility must be provided by the generator to allow Permitted Unit personnel to properly store received wastes in the appropriate area during the period of storage.

3.1.8. A completed, generator-furnished Chemical Waste Profile must contain the following information required for Permitted Unit personnel to (a) verify that the waste may be received at the Permitted Unit in accordance with its RCRA permit, (b) verify that contents of the container match the Chemical Waste Profile, and (c) properly store and manage the incoming waste prior to shipment to an off-site TSDF:

- Generator name and site location
- IWS number, if applicable (Each IWS description identifies the specific process that generated that waste stream.)
- Description and knowledge of waste obtained from reviewing Safety Data Sheets (SDS), or relevant process information
- Description of container(s)
- Analytical results that includes test methods and detection limits, if performed
- Physical description (color, odor, physical state, percent composition, specific gravity, other)

- Potential incompatibilities
- Ignitability
- Corrosivity
- Reactivity
- EPA/Ecology toxicity characteristics leaching procedure (TCLP) results
- EPA/Ecology specific waste information, such as persistent chemicals, or specific waste listing
- U.S. Department of Transportation (DOT) packaging and labeling requirements
- LDR notification forms
- Summary of waste designation and characterization determination
- Signature of person who completed the profile/determination

3.1.9. Each Chemical Waste Profile must be reviewed and approved by the BPA Chemist before waste is delivered to the permitted unit. The BPA Chemist must be trained in and be familiar with the Waste Analysis Plan and waste acceptance procedures of the Permitted Unit. The approved profile must be signed and dated by the trained BPA Chemist.

3.2. Detailed Chemical, Physical, and/or Biological Analysis

3.2.1. Generator-Supplied Analyses [-300(5)(e) & (g), [-300(5)(b)]

3.2.1.1. The BPA generator provides all the necessary information on the Chemical Waste Profile for Permitted Unit personnel to complete necessary waste verification, determine proper waste storage at the Permitted Unit, and arrange for proper off-site disposal at a permitted TSDF.

3.2.1.2. BPA generator locations, in conjunction with the BPA Chemistry Laboratory, use three basic methods to complete the waste designation and fill out the Chemical Waste Profile:

- Personal knowledge of the waste
- Manufacturer information
- Laboratory analysis

3.2.1.3. The BPA Chemistry Laboratory supports the BPA generator locations during all phases of the waste designation process. The BPA Chemist subsequently approves and signs each waste profile. The BPA Chemist receives Waste Analysis Plan training, as detailed in Section H, Personnel Training.

3.2.2. Personal Knowledge of the Waste [-300(2)(a)]

3.2.2.1. Personal knowledge of the waste stream is the most common and most efficient method of waste identification used at BPA. Since the majority of maintenance and construction activities at BPA take place on a recurring basis, so does the generation of a specific waste stream (that is, IWS). Over time, BPA generating location personnel have become very knowledgeable about the IWSs that are generated by specific work activities performed.

3.2.2.2. Personal knowledge of the waste stream is used to determine whether it fits the description of one of BPA's existing Identified Waste Streams. “Acceptable knowledge” means information that is known about the generation of a waste stream that can be used in the place of laboratory analysis of the waste stream. For example, if all chemical constituents used in an industrial process that generates a waste stream are known and the formation of the waste stream from the industrial process is well understood, then that information might be adequate, without direct analysis of the waste stream, to designate a waste stream and complete a Chemical Waste Profile.

3.2.2.3. When Permitted Unit personnel rely on knowledge from the generator for waste designation or for this detailed analysis (commonly known as a waste profile) instead of analytical testing of a sample, that information must be documented and must meet the definition of knowledge as defined in WAC 173-303-040. To confirm the sufficiency and reliability of the "knowledge" used for the waste profile, Permitted Unit personnel must do one or more of the following in accordance with WAC 173-303-300(2)(a):

(i) Be familiar with the generator's processes by conducting site visits[1] and reviewing sampling data and other information provided by the generator to ensure they are adequate for safe management of the waste;

(ii) Ensure waste analysis contained in documented studies of the generator's waste is based on representative and appropriate sampling and test methods;

(iii) Compare the generator's waste generating process to documented studies of similar waste-generating processes to ensure the waste profile is accurate and current.

Site visits conducted at generator locations by Permitted Unit personnel throughout the year will be documented in the operating records.

3.2.3. Manufacturer Information

3.2.3.1. Manufacturer information includes information such as chemical product container labels, equipment labels, and product SDS. As with personal

[1] Telephone interviews may be used in lieu of site visits.

knowledge, manufacturer information is used to assist in the determination of waste constituents and the proper waste stream identification. If adequate information on the chemical composition of the waste stream is available, it is used to determine whether or not the waste stream fits the description of one of BPA's existing IWS Chemical Waste Profiles and whether or not sufficient information is available to designate the waste stream.

3.2.3.2. If the waste stream does not fit any of the current IWS Chemical Waste Profile descriptions, the manufacturer's information is provided to the BPA Chemistry Laboratory. If the Chemistry Laboratory has sufficient information to complete a Chemical Waste Profile, this task is completed. Otherwise, the manufacturer information is used to assist in the selection of appropriate test methods from Table C-3, followed by preparation of the Chemical Waste Profile.

3.2.4. Laboratory Analysis [-110 & -300(5)(a)]

3.2.4.1. This method of waste stream identification must be used when there is insufficient personal knowledge and manufacturer information about a waste stream that has been generated or if it is suspected that the waste stream has been contaminated with other hazardous constituents.

3.2.4.2. The BPA Chemistry Laboratory (or Subcontractor Laboratory) has followed and continues to follow analytical procedures as approved by EPA and Ecology. These include methods identified in WAC 173-303-110, *Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods* [EPA SW-846, Third Edition, Update V (August 2015, or later updates, when available)]; American Society for Testing Materials (ASTM); and other methods specified in this application. Other standard reference materials used include the following:

- *A Method for Determining the Compatibility of Hazardous Wastes* (EPA-600/2-80-076, April 1980). This manual is used to evaluate potential incompatibilities of waste materials with other wastes managed at the Permitted Unit, and it is also used as the primary tool for assigning the permitted storage room location at the Permitted Unit.
- *40 CFR Part 261 – Identification and Listing of Hazardous Waste. Subparts C* (Characteristics of Hazardous Waste) and D (Lists of Hazardous Waste) are used to define and assign proper federal hazardous wastes by their appropriate waste identification codes.
- *WAC 173-303-080 – Dangerous Waste Lists.* This is the state counterpart for 40 CFR 261, Subpart D, and it also includes state-specific waste identification code numbers.

- *WAC 173-303-090 – Dangerous Waste Characteristics.* This is the state counterpart for 40 CFR 261, Subpart C, and also includes state-specific waste identification code numbers.
- *WAC 173-303-100 – Dangerous Waste Criteria.* Based on quantitative constituent analysis, the toxicity and persistence calculations are used to "book designate" wastes that may be regulated as state-only dangerous wastes.[2]
- *40 CFR Part 268 – Land Disposal Restrictions.* Based on the waste designation and profile results, LDR regulations are reviewed to ascertain restrictions that may be applicable to these wastes when they are shipped to off-site permitted TSDFs for final disposition.
- *40 CFR Part 302 – Designation of Reportable Quantities.* Based on the waste designation and profile results, these regulations are used to select applicable reportable quantities (RQs) for the dangerous waste constituents that are to be entered on the Uniform Hazardous Waste Manifest or shipping paper.
- *49 CFR Parts 172, 173, and 178.* Based on the waste designation and profile results, these regulations are used to select the proper DOT-approved packaging, labeling, and placarding for individual waste containers.

3.2.4.3. The BPA Chemistry Laboratory (or Subcontractor Laboratory) follows all published method procedures for sample containers, sample preservation, allowable holding times, sample preparation, preparation and use of standards and reagents, instrument calibration, quantitation limits, and quality assurance/quality control (QA/QC) protocols.

3.2.4.4. The analytical procedures and standard methods listed in Table C-3 have been chosen for their ability to identify the physical and chemical characteristics of the waste and to provide the information required to properly and safely designate and manage wastes. In each case, the BPA generator works with the BPA Chemistry Laboratory and District Field Environmental Lead, as necessary, to select the appropriate parameters from those listed in Table C-3 according to the needs and requirements specified for profile analyses and considering knowledge of process and historical data on file at the BPA Chemistry Laboratory.

3.2.4.5. To obtain a laboratory analysis of a waste, the generating location sends a sample of the waste [labeled with a completed Laboratory Sample Label for

[2] Examples of references used to book designate Ecology criteria waste include the Ecotox Database, TOXNET (Toxicology Data Network), and the Hazardous Substance Data Bank (HSDB).

Waste Analysis (BPA Form F5410.03) and accompanied by a completed Sample Custody Record Form (BPA Form F5450.06)][3] to the BPA Chemistry Laboratory. The Chemistry Laboratory (or Subcontractor Laboratory) completes necessary analysis in accordance with Table C-3 to designate the waste, assign the proper waste codes, and determine the applicability of any LDRs. Lastly, the Chemistry Laboratory prepares the Chemical Waste Profile.

3.2.4.6. To the extent practicable, the generator or the BPA District Field Environmental Leads representing the BPA generator location will furnish the Chemistry Laboratory with as much information as possible about the source and origin of the waste stream.

3.2.4.7. Samples received by BPA Labs for analysis have a target waste profile completion of 30 days and a Not-to-Exceed period of 90 days from initial receipt of sample to the waste being appropriately profiled and presented for acceptance to the HMB. At the time of this permit application, all waste analysis is being performed by a subcontract laboratory. BPA reserves the right to self-perform this analysis at a future date.

3.2.5. Analytical Parameters and Methods [-300(5)(a)]

3.2.5.1. Parameters, analytical methods, and rationale for waste designation are listed in Table C-3. Detection and reporting limits, as appropriate, are defined by the individual methods being employed.

3.2.5.2. If it is determined that quantitative analysis is necessary to perform a waste designation, field personnel follow the sampling procedures identified or referenced in this waste analysis plan and arrange for analysis with the Chemistry Laboratory. In conjunction with generator-supplied process and material information, the Chemistry Laboratory (or Subcontractor Laboratory) uses the methods listed in Table C-3 to complete the "generator-side" designation and to prepare the Chemical Waste Profile prior to arranging for shipment of the material to the Permitted Unit.

3.2.5.3. For purposes of demonstrating compliance with Subpart CC air emission standards, all waste received at the HMB has a profile created by a BPA chemist and includes VOC/SVOC concentration--determined from either analytical or manufacturer information if the waste is unused product. Table C-3 references Method 8260D for VOCs and 8270E for SVOC. The sum of all volatile organic concentrations is used to determine whether a container is in light or heavy material service. Total volatile organic

[3] Samples of these forms are included in Attachment C-2, Waste Sampling Procedures; BPA reserves the right to modify or revise these forms, as appropriate. At a minimum, the information contained on the sample forms will be retained in future versions of these forms.

concentration greater than 100,000 ppm or mg/kg would be light material service, and less than 100,000 ppm or mg/kg would be heavy material service. Occasionally the HMB receives containers greater than 26 gallons that might also be light material service, but there is no liquid transfer or consolidation in this case.

4. Methods of Obtaining or Testing for Analytical Parameters [-300(5)(b), 690 through 692]

4.1. In addition to the methods described in Section 3, this section summarizes the processes and procedures that BPA implements to evaluate and test known identified dangerous waste streams, contaminated media, and non-routine waste. Figure C-1 illustrates the process BPA implements to identify, profile, and document routine (known) and non-routine dangerous waste managed at the Permitted Unit.

4.2. Identified Dangerous Waste Streams

4.2.1. BPA has compiled a comprehensive manual of routinely generated "identified waste streams" into the IWS Handbook.[4] Table C-4 provides detailed descriptions of the processes that generate the wastes, their corresponding EPA and Ecology waste identification codes, and whether or not LDR notifications are required for the individual waste streams.

4.2.2. Several example profiles from the IWS Handbook Chemical Waste Profiles are provided in Attachment C-1. The Chemical Waste Profile contains all required waste designation information, including results of chemical and physical testing, assignment of EPA and Ecology waste designation codes, applicable DOT shipping name and label information, manifest or shipping paper requirements, applicable LDR information, and other relevant information.

4.2.3. For identified waste streams, the Chemical Waste Profile is accessed electronically and is part of the IWS Handbook. These Chemical Waste Profiles are used to satisfy the Permitted Unit's waste analysis requirements. Waste profiles must be reviewed, approved, and signed by the BPA Chemist on a frequency described in Section 7. Once a waste is received at the unit, Permitted Unit personnel complete appropriate waste verification procedures to confirm that the waste is as indicated on the Chemical

[4] The IWS Handbook's primary function is to assist BPA generator facilities with proper waste identification, designation, and waste management information. Completed Chemical Waste Profiles are contained in the IWS Handbook and are also part of the Permitted Unit's operating record. The Chemical Waste Profiles are used to assist Permitted Unit personnel with verifying incoming waste shipments, determining appropriate storage at the Permitted Unit, and assigning proper manifest, labeling, and LDR treatment codes as the material is shipped to off-site permitted TSDFs.

Waste Profile in accordance with the Waste Analysis Plan (see Section 8, Verification of Incoming Waste).

4.3. Contaminated Environmental Media

4.3.1. Wastes generated from BPA environmental restoration activities (including spill cleanup) must be sampled and analyzed as an element of the field operation. These activities operate according to written site-specific or generic sampling and analysis plans that specify investigation-derived wastes or remediation waste designation and management. If contaminated environmental media (for example., drill cuttings, and well development and purge water) will be generated as a component of the field program, these wastes must be sampled, analyzed, designated, and profiled in a manner equivalent to that identified in Section 4.4, Non-Routine Wastes.

4.3.2. Contaminated environmental media received at the Permitted Unit can include soil, sediments, surface water, groundwater, debris, and residues associated with site activities, such as well development and purge water, and contaminated personal protective equipment.

4.3.3. As part of each site-specific activity, a sampling and analysis plan must be prepared to ensure that proper sampling and analysis are performed for site characterization, as well as appropriate designations for proper residue handling.

4.3.4. Dangerous waste designations and profiles for contaminated media are completed by the BPA Chemistry Laboratory with knowledge of process input and assistance from field personnel. Upon completion of the waste designation and the Chemical Waste Profile for contaminated media samples, the BPA Chemistry Laboratory signs the completed profile and sends the approved profile back to the generating location, forwards a copy to the Permitted Unit for insertion in the operating record, and retains a copy in the Chemistry Laboratory files.

4.3.5. The waste stream will not be transferred to the Permitted Unit until the BPA Chemist signs off on the waste profile and the profile is provided to the Permitted Unit.

4.4. Non-Routine Wastes

4.4.1. Periodically, wastes are generated throughout the BPA service territory or at the Ross Complex for which an Identified Waste Stream – Chemical Waste Profile has not been prepared. These include one-time wastes, routinely generated waste streams that differ in composition each time they are generated, wastes that are generated infrequently, or when a routinely generated waste stream is suspected of being mixed with another waste. In these instances, a waste-specific designation and

characterization determination must be initiated by the generator location in conjunction with the BPA Chemistry Laboratory.[5]

4.4.2. To the extent practicable, the generator or the District Field Environmental Leads representing the BPA generator location will furnish the Chemistry Laboratory with as much information as possible about the source and origin of a non-routine waste stream.

4.4.3. If the Chemistry Laboratory determines that quantitative analysis is necessary to designate the waste or otherwise complete a reliable waste profile, field personnel (or Permitted Unit personnel or BPA Chemists if the material is at a Ross Complex 90-day storage area) follow the sampling procedures identified or referenced in this waste analysis plan and arrange for analysis with the BPA Chemistry Laboratory or outside contracted laboratory. The BPA Chemistry Laboratory follows the analytical procedures listed in Table C-3 to complete the generator-side analysis, designation, and profiling of non-routine waste stream prior to shipment of the material to the Permitted Unit. The BPA Chemistry Laboratory then completes the Chemical Waste Profile by assigning appropriate waste codes, DOT packaging and labeling information, and shipping paper information and determines applicable LDR requirements.

4.4.4. Upon completion of the waste designation and characterization determination for non-routine wastes, the BPA Chemistry Laboratory sends the completed profile back to the generating location, forwards a copy to the Permitted Unit, and retains a copy in the Chemistry Laboratory files.

4.4.5. The waste stream will not be transferred to the Permitted Unit until a BPA Chemist signs off on the waste profile and the profile is provided to the Permitted Unit.

5. Management of Containerized Waste at the Permitted Unit

5.1. Only three dangerous waste management activities are performed at the Permitted Unit:

5.1.1. Storage of containerized waste until shipment to an off-site permitted TSDF

5.1.2. Consolidation and bulking (into containers) of partially filled containers of waste with the same or compatible EPA/Ecology waste codes

5.1.3. Lab packing to consolidate similar and compatible wastes for off-site shipment from the Permitted Unit

5.2. While containerized waste is stored at the Permitted Unit, the primary criterion for its safe management is to provide segregated storage for potentially incompatible wastes. Complete physical descriptions of each storage room in the Permitted Unit are provided in Section D, Process Information, of this permit application.

[5] Procedures used by BPA generator locations for sample collection and requesting laboratory analyses are included in Volume I of the IWS Handbook. See also Attachment C-2, Waste Sampling Procedures.

5.3. Consolidation and bulking are performed only on partially filled containers of wastes bearing the same or compatible waste streams. After repackaging in the Bulking Room, containers must be placed in the appropriate storage area until off-site shipment.

5.4. As discussed in Section D, BPA uses the Level 1 container management standards for wastes potentially subject to the 40 CFR 264, Subpart CC air emission standards for containers. Therefore, no additional storage or handling provisions are required beyond those required in 40 CFR 264.1086(c).

5.5. All permitted storage areas have integral secondary containment systems; therefore, additional waste analysis requirements to demonstrate that secondary containment is not required are not applicable.

5.6. Upon verification of incoming waste (see Section 8), Permitted Unit personnel move containers of waste into one of the designated storage areas in accordance with Table C-5. Table C-5 incorporates information collected from completed Chemical Waste Profiles and waste stream compatibility information compiled by the BPA Chemistry Laboratory in Table C-6.

5.7. Based on the general chemical and detailed analytical results received from the Chemistry Laboratory, Permitted Unit personnel consult the standard reference document, *A Method for Determining the Compatibility of Hazardous Wastes* (EPA-600/2-80-076, April 1980), to assess potential storage incompatibilities once the containers are received at the Permitted Unit. Based on this assessment, unit personnel decide which room to store the material in.

5.8. Laboratory packing is performed by BPA Dangerous Waste Transportation and Disposal subcontractors within the Bulking Room at the Permitted Unit. Immediately after lab packing, the containers must be transferred off site to a final permitted TSDF or returned to their respective storage room at the Permitted Unit. Lab packs are rarely stored at the Permitted Unit; however, they may be returned to the appropriate storage room until they are shipped off site. Lab-packed containers containing compatible wastes can remain in the Bulking Room for no more than 24 hours.

5.9. Tracking System [300(6)(a)]

5.9.1. The Permitted Unit has implemented a waste tracking system that allows tracking from the point of generation within the BPA service territory through final disposition at an offsite permitted TSDF. The system incorporates both paper and electronic tracking mechanisms. This system is depicted in Figure C-2. The key physical elements of the waste tracking system include the following:

5.9.1.1. All containers must be assigned a unique, non-repeating, drum identification number at the point of generation. This number is referred to the “H-number” or “H-code” as the numbering system uses an “H” prefix followed by a unique number. A numbered label must be applied to the top and side of each container for easy identification.

5.9.1.2. The H-code serves as BPA's internal tracking number for the movement of containers from the service territory, at the Permitted Unit, and ultimately as the containers are shipped to off-site TSDFs.

5.9.1.3. Transactions, such as container-specific waste analysis, and movement of containers at the Permitted Unit, use the H-code as the primary identification.

5.9.1.4. All Chemical Waste Profiles completed by the BPA Chemistry Laboratory use unique, non-repeating serial numbers.

5.9.1.5. When wastes are received and initially processed at the Permitted Unit, a written Container Log Sheet must be prepared for each container. The log sheet includes the following essential information: (see Figure C-3 for an example of a completed form)

- Shipping Paper Identification Number
- Original accumulation start date at the point of generation
- Date received at Permitted Unit
- Container number (H-code)
- Type, size, and weight of container
- Generator location
- Identified Waste Stream number, if applicable
- Waste description and EPA/Ecology waste codes
- DOT description
- Laboratory waste profile/sample identification number, if applicable
- Designated Permitted Unit storage location
- Blank locations for filling in the date shipped off site and the outgoing manifest number

5.9.1.6. In instances where contents of containers are consolidated into a new container in the Permitted Unit Bulking Room, the original H-codes from the source containers are retired and a unique "C-code" is assigned to the combined contents. The original H-codes are tracked with the new C-code to denote what containers (and wastes) were repackaged.

5.9.2. Within 3 to 5 days after a container is received at the Permitted Unit, all information transcribed onto the Container Log Sheet must be transferred into the Permitted Unit's Waste Tracking Database and Information System (see Section 9, Facility Record Keeping). Container Log Sheets must be also maintained in the Permitted Unit operating record (see Section 9, Facility Record Keeping).

6. Representative Samples of Wastes for Analysis [-300(5)(c), -110(2)]

6.1. All BPA generators, chemists, and Permitted Unit personnel follow the Quality Assurance Program presented below to ensure representative samples are collected for waste analysis.

6.2. Quality Assurance Program

6.2.1. **Sample Collection.** Since the analysis of a sample can be only as good as the sample itself, extreme care must be taken to obtain a sample that is representative of the material in question. To ensure this is accomplished, the tools and equipment must be clean and dry prior to sampling. If a number of samples are to be collected using the same tools and equipment, they must be thoroughly cleaned and dried between each sample. The sampling of materials for waste analysis does not require the use of tools or equipment requiring calibration. Sampling procedures, container requirements, and preservation methods are defined in Attachments C-2 and C-3 for consistency between generators when waste designations are being performed. Once the samples have been collected and placed into the appropriate container, the sample identification label must be completed, placed on the sample container, and forwarded to the Chemistry Laboratory (or Subcontract Laboratory) along with the waste analysis test request and chain of custody form. See Attachment C-3 for sample forms.

6.2.2. **Chemical Analysis.** The BPA Chemistry Laboratory (or Subcontractor Laboratory) follows the written quality assurance protocols for the EPA or American Society for Testing Materials (ASTM) standard method being employed. A copy of the BPA Chemistry Laboratory's Quality Assurance/Quality Control Plans (QAQCP) is provided in Attachment C-4. Subcontractor laboratories must also follow BPA's or an equivalent QAQCP when performing analysis on behalf of BPA.

6.2.3. **Chain of Custody.** All samples forwarded to the Chemistry Laboratory for analysis must be collected and transported under chain of custody procedures. A sample chain of custody record, BPA Form 5450.06 (Attachment C-3), must be accurately completed and used to transfer custodial possession of the samples until they are received by the laboratory performing the analysis. The sampler must indicate on this form the type of analysis requested.

6.2.4. **Cleanup and Disposal.** All used solvent, rags, gloves, and other material resulting from the sampling effort shall be properly stored, labeled, and disposed of using normal non-dangerous or dangerous waste disposal procedures.

7. Frequency of Analysis [-300(4)(a) - (b) & (5)(d)]

7.1. Generator Analysis

7.1.1. Chemical Waste Profiles for each dangerous IWS must be reviewed or redesignated, and recertified, at a minimum of every 2 years, or when:

- new and revised information becomes available,
- reanalysis is performed on selected waste streams,
- the process or materials contained in a waste stream are changed or modified, or
- an incoming waste does not match the identity of the waste specified on the waste stream profile or shipping papers and the waste stream was correctly designated. For example, if it is determined the incoming waste stream was incorrectly designated and the dangerous IWS chemical waste profile remains accurate, then the dangerous IWS profile may not be "recertified." The dangerous IWS chemical waste profile will have undergone a review.

7.1.2. The review and recertification (and redesignation, if necessary) may be satisfied by knowledge of the generator process or by sampling and analysis (see Table C-3). Waste stream profiles will not be allowed to expire. If an IWS is available for sampling during the two-year recertification cycle,[6] then it will be sampled and analyzed (see Table C-2). If an IWS is not available for sampling during the recertification cycle due to the intermittent generation of most of BPA's identified waste streams, the IWS will be recertified based on knowledge. The knowledge review will consist of interviews with a representative number of generator sites; review of current written work standards; and literature knowledge where available and applicable. All profiles will be active for two calendar years (January through December) and will expire in December of even years. IWSs that are recertified based on knowledge because the waste stream is not available for sampling will be sampled during the active profile period when the waste stream becomes available. If IWS sampling shows inconsistencies, BPA will follow the procedures in Sections 3 and 4 for evaluating and profiling the waste stream. New waste stream profiles will be created as needed, as described in Sections 3 and 4. Redesignations must be recertified by the BPA Chemist.

7.1.3. A new Chemical Waste Profile must be completed for each remedial waste stream (Section 4.3.) and non-routine waste stream (Section 4.4.) each time one of these waste streams is generated.

7.1.4. A waste stream (including dangerous IWS and non-routine waste stream) will not be transferred to the Permitted Unit unless a trained BPA Chemist has signed and dated a Chemical Waste Profile for that waste stream according to procedures outlined in Section 3, and the Chemical Waste Profiles is current according to procedures and schedules in this Section.

7.2. Permitted Unit Analysis

7.2.1. The frequency of analysis that will be performed at the Permitted Unit is described in Section 8.

[6] The recertification cycle is the last quarter of the current profile period.

7.2.2. In addition to verification analysis as described in Section 8, the Permitted Unit will conduct a self-audit of this Waste Analysis Plan by performing independent third-party analysis of 10 percent of dangerous waste streams undergoing Tier II verification. Samples collected for Tier II verification analysis will be split. One sample will be analyzed by the BPA Chemistry Laboratory, and the second sample will be analyzed by an independent third-party laboratory accredited by Ecology that is not affiliated with the BPA laboratory. BPA will collect an "audit split" sample of the first incoming waste stream subject to Tier II verification received at the Permitted Unit each calendar year during the permit period. Subsequent audit split samples will be collected from each successive 10th waste stream undergoing Tier II verification during the calendar year. The process will restart each calendar year. This method results in random selection of waste streams undergoing the audit and will audit all profiles, multi-user and location-specific. This will help ensure consistency of the profile process.

7.2.3. If the results of the waste audit laboratory analysis are not consistent between the BPA Chemistry Laboratory and the third-party independent laboratory, then the Permitted Unit will collect an additional sample for analysis by both laboratories. Additional sampling will be done if all of the following are true: (1) the results vary by more than 20 percent for a given parameter, (2) the laboratory quality control objectives are met, and (3) the discrepancy indicates a potential discrepancy in the waste designation. If the results of the re-analysis remain inconsistent, BPA will perform a review of the sampling and laboratory procedures to identify the root cause of each inconsistency. If the inconsistent laboratory analysis results do not affect the waste designation, then no further action is required by the Permitted Unit. However, a notification will be made to the BPA laboratory to investigate the inconsistent results.

7.2.4. If the laboratory results identify a discrepancy on the profile, then the Permitted Unit must redesignate, reprofile, and recertify the waste stream to meet the current waste analysis results. This will occur if the following conditions are true: (1) the laboratory results are consistent between laboratories, meaning the results vary by less than 20 percent for a given parameter, (2) the laboratory quality control objectives are met, and (3) the results show the characteristics of the waste are not consistent with the profile received at the Permitted Unit. If needed, the waste will be relocated to the correct storage room.

7.2.5. The Permitted Unit will perform a follow-up review of the waste stream profile that was identified to be discrepant and required redesignation. This review must include interviews with persons generating the waste, and a review of any laboratory results obtained during the profiling process. The review may include an inspection of the site generating the waste. Additionally, the audit results will be evaluated to assess if the inconsistency could occur at other locations or with other waste streams.

7.2.6. If the laboratory results are consistent between laboratories, then no further action is required if the following is true: (1) the laboratory results are within 20 percent of

each other for a given parameter, (2) the laboratory quality control objectives are met, and (3) the results show that the characteristics of the waste are consistent with the profile received at the Permitted Unit.

7.2.7. After the fifth year of the permit, BPA will review the results of the self-audits and make a determination regarding the effectiveness of the audit process. BPA will make recommendations to Ecology regarding continuation, modification, or discontinuation of this self-audit program

7.2.8. The audit results, follow-up reviews of waste stream profiles, if needed, and evaluations of the results will be kept in the operating record.

8. Verification of Incoming Waste [-300(3) & (6)(a) – (c)]

8.1. This section describes the process that Permitted Unit personnel implement to verify that the incoming shipments are as specified on the shipping papers. This procedure must be implemented for all shipments received at the permitted unit.

8.2. Methods for Collecting Samples for Detailed and Verifying Analyses

8.2.1. Permitted Unit personnel follow the procedures for sampling waste contained in Attachment C-2, together with the procedures detailed in this section.

8.2.2. The primary physical/chemical criterion for the safe management of wastes at the Permitted Unit is to provide segregated storage for wastes with potential incompatibilities. When incoming wastes are received at the Permitted Unit, they are physically inspected and subjected to verification procedures to verify their identity and to confirm the room location for storage.

8.3. Parameters and Rationale to Verify Identity of Incoming Waste

8.3.1. As indicated in Table C-7, Permitted Unit personnel perform verification analysis to verify that the incoming waste matches the description on the shipping papers and waste profile, and to confirm where the container will be stored within the Permitted Unit. That is, verification analysis is performed to ensure the following:

- The incoming waste stream is the one on the shipping papers and represented by its waste profile.
- Acids and bases must not be stored in the same room.
- Flammables/ignitables must not be stored in the same room as acids and bases, respectively.
- Reactives must be stored separately from other wastes.
- Toxic (TCLP-only) and state-only dangerous wastes must be stored separately from other wastes.

8.3.2. Permitted Unit personnel follow the procedures identified in this section to verify the identity of incoming wastes. The rationale for selecting chemical and physical

parameters and analysis of incoming wastes is summarized in the following subsections.

8.3.3. All waste received at the permitted unit must be correctly labeled as indicated by the IWS or individual chemical waste profile generated by the chemistry lab. This includes a label stating "Hazardous (Dangerous) Waste" and the risk associated with the waste.

8.3.4. All incoming containers of dangerous waste at the Permitted Unit receive a minimum level of waste verification. This includes dangerous wastes that are profiled by the generator location as being an IWS, contaminated media, and non-routine waste. In summary, at a minimum, all containers must be subject to Tier I verification. If a container of dangerous waste does not pass the Tier I verification, it must then be subject to Tier II verification and, if needed, to Tier III verification. Select containers are automatically subject to a minimum of Tier I and II verification and, if needed, to Tier III verification at the frequency described in Section 8.5 and Table C-7. The verification levels consist of the following.

8.3.4.1. Tier I Verification – Is performed on all Permitted Unit incoming containers of dangerous waste. This verification step includes cross-referencing shipping papers and labels, ensuring the waste codes referenced on the shipping papers are listed in Part A of the facility permit, ensuring the waste stream has a current profile, and doing a visual inspection of the dangerous waste to verify it meets the shipping paper description. Visual inspections require removal of the bung or lid and, if necessary, removal of an aliquot of the waste. The waste aliquot will be replaced to the drum and the lid securely replaced immediately following inspection. The operator will conclude whether or not the waste meets the profile description. If yes, the container(s) is/are moved into the appropriate storage room. If not, the operator will proceed to Tier II.

8.3.4.2. Tier II Verification – Is performed on containers of dangerous waste that do not pass the Tier I verification. Additionally, Tier II verification must be performed on select containers of dangerous wastes as described in Section 8.5. Permitted Unit personnel perform the following Tier II verification steps.

- Open container (remove lid or bung).
- Collect a representative grab sample of the waste using an appropriate sampling device:
  - Free-flowing liquids and slurries – Composite Liquid Waste Sampler (COLIWASA)
  - Sludges – Trier
  - Moist powders or granules – Trier
  - Dry powders or granules – Thief

- Sand or packed powders and granules – Hand Auger
- Large-grained solids – Large Trier

- Perform verification analysis indicated in Table C-7.
- Replace unused grab sample in container and close container (replace and secure lid or bung).
- Cross-check observations with the completed waste profile.
- Conclude whether or not waste meets the profile description. If yes, move the container(s) into the appropriate storage room.

8.3.4.2.1. If the dangerous waste cannot be verified using the Tier I and II procedures listed here and in Table C-7, BPA Permitted Unit personnel will contact the generator and/or District Field Environmental Lead and the BPA Chemistry Laboratory to attempt to resolve the discrepancy. If the discrepancy cannot be resolved, Permitted Unit personnel or BPA Chemistry Laboratory personnel will collect a representative sample and arrange for an additional analysis of the waste using the Tier III verification procedures described in Table C-7.

8.3.4.2.2. At the conclusion of either Tier I or Tier II verification steps, if the results clearly indicate that the dangerous waste has been incorrectly designated and/or characterized (for example, a non-corrosive waste is actually corrosive), Permitted Unit personnel will redesignate the waste using the procedures outlined in Section 3 and Table C-3.

8.3.4.3. Tier III Verification – As noted above, this step must be performed on containers of dangerous waste that do not meet the Tier II verification step and require additional laboratory analysis to identify the characteristics of the waste or properly designate the waste. Table C-7 identifies the parameters that will be performed. During the period of analysis, the containerized waste will be stored in Room 102C of the Permitted Unit.

8.4. Analytical Methods to Verify Identity of Incoming Waste

8.4.1. The procedures and methods identified in Section 8.5 and Table C-7 must be employed to verify the identity of incoming dangerous wastes. As described in Section 8.5, if a lower Tier of verification is insufficient to verify the waste stream, additional quantitative analysis of higher Tier verification must be conducted.

8.4.2. The analyses performed include procedures to provide a general identification of the waste, to verify that the waste received is as described in acceptance paperwork, or, if a discrepancy is noted, to provide information necessary to determine how to manage the waste.

8.5. Representative Sampling of Incoming Wastes

8.5.1. Wastes Received from Generators of >2,000 Pounds/Month or Large Quantity Generator (LQG) Locations. Ten percent of waste containers from each individual LQG will undergo Tier II verification. The Permitted Unit will sample and subject the 10th incoming container from each >2,200 generator to the Tier I and Tier II verification analysis identified in Section 8.3 to verify the waste identity. This method ensures random verification will be applied to the process because the Permitted Unit person has no control over the order, type, or number of dangerous waste containers received at the Permitted Unit.

8.5.1.1. If the 10th container is among a shipment of more than one container, then the container that will be subject to verification will be randomly selected using a random number generator. Figure C-4 illustrates the verification process for >2,200 pounds/month generators.

8.5.2. Wastes Received from Generators of 220–2,200 Pounds/Month or Medium Quantity Generators (MQG) Locations. Dangerous waste from individual MQGs will undergo the same process as >2,200 generators. Figure C-4 illustrates the verification process for 220–2,200 pounds/month generator locations.

8.5.3. Wastes Received from Generators of <220 Pounds/Month or Small Quantity Generators (SQG) Locations. The vast majority of BPA generator locations throughout the service territory generate less than 220 pounds per month of dangerous waste. Nearly all shipments from these SQGs are single containers, potentially with as few as a single container per year from an individual SQG. Ten percent of the incoming containers received from the aggregate of all SQGs must be sampled and subjected to the Tier II verification analysis to verify the waste identity. That is, every 10th container received from the aggregate of all SQGs is sampled, as depicted in Figure C-5. The Permitted Unit will track the number of containers received from the aggregate of SQGs to ensure that the 10th container received is subjected to the verification analysis.

8.5.3.1. If the 10th container is among a shipment of more than one container, then the container that will be subject to verification will be randomly selected by the operator. Figure C-5 illustrates the verification process for <220 pounds/month generators. The random number will be selected with a publicly available random number generator.

8.6. Procedures for Receiving Shipments

8.6.1. Figure C-6 provides a schematic overview of the procedures followed when wastes are received at the Permitted Unit. The waste profile and shipping papers verification procedures include the following:

- The Electrical Utility Material Handler checks the waste code numbers on the shipping papers against the waste codes listed on Part A of the facility permit to verify that the waste is permitted for acceptance at the Permitted Unit.

- Initial, "as received" discrepancies are identified (for example, signatures, dates, ID numbers), if any, and noted on the shipping papers.[7]
- The containers are then unloaded in the receiving area.
- The Electrical Utility Material Handler completes a container-by-container verification to ensure that all the proper entries have been made, the waste has been properly identified, the quantity on the shipping papers matches the waste shipped, and LDR notification forms are attached, if necessary.[8]
- Any additional discrepancies are noted on the shipping papers.
- The Electrical Utility Material Handler signs and dates the shipping papers and gives the transporter a copy for their records.
- Once the container(s) is/are transferred into the Shipping and Receiving room of the Permitted Unit, the Electrical Utility Material Handler determines which containers will receive the physical inspection and verification analysis as required under this Waste Analysis Plan.
- If no significant discrepancies are discovered, the waste must be logged in and placed in the appropriate storage room. (See Section 8.7 for resolution of significant discrepancies.)
- Key information must be entered into BPA's computerized tracking system.

8.7. Response to Significant Discrepancies

8.7.1. Significant profile or shipping paper discrepancies are rare. For the purposes of verification, a significant discrepancy during waste in-processing would occur when a dangerous waste does not meet the description identified on the Chemical Waste Profile or shipping papers (see Sections 8.2 through 8.6 for the detailed verification, recharacterization, and redesignation procedures).

8.7.2. The procedure for responding to significant discrepancies is depicted in Figure C-7. The Material Handler and HMB Foreman are responsible for resolving significant shipping paper discrepancies with the generator location. As necessary, Permitted Unit personnel also work with the BPA Chemistry Laboratory to arrange for, and complete, waste sampling and analysis.

[7] If discrepancies are noted and cannot be resolved, the HMB Foreman is contacted.

[8] For Identified Waste Streams, the Chemical Waste Profile is reviewed to assist in the verification of shipping paper entries. For non-IWS dangerous wastes, the Chemical Waste Profile, furnished by the BPA Chemistry Laboratory, is used to assist in the verification steps.

8.8. Provisions for Non-Acceptance of Shipment

8.8.1. In the history of the HMB Dangerous Waste Permit, no waste has been received at the Permitted Unit that was not listed in Part A of the RCRA permit. Additionally, because all dangerous waste received at the Permitted Unit is generated by BPA, the Permitted Unit personnel will take all reasonable measures to not reject a shipment from any other BPA generator location provided the waste is included in Part A. The sole purpose of the Permitted Unit is to serve as the central location for storing and accumulating BPA's dangerous waste prior to shipment to off-site permitted TSDFs for final disposition. A waste stream that is not specified in Part A or does not have a current profile according to Section 7 will not be accepted for storage.

8.8.2. In the event that waste is received at the Permitted Unit that would otherwise be rejected under the conditions of WAC 173-303-370(5) and Section 8.7, the Electrical Utility Foreman will take all prudent and reasonable steps to resolve the condition. Example conditions and reasonable responses are summarized below:

- **A waste is received that is not listed as a permitted waste stream in Part A of the permit.** If an incoming dangerous waste is received that is tentatively identified as not listed in Part A of the RCRA permit, the Permitted Unit will complete necessary designation procedures identified in Section 4.4 (Non-Routine Wastes). The waste will temporarily be stored in Room 102C within its own secondary containment device and physically isolated from other wastes stored in that room. If it is determined that the material is not one of the permitted waste streams, the Permitted Unit personnel will work with its vendors so that the waste can be transshipped to an off-site permitted TSDF as soon as possible but no later than a maximum of 10 days after the waste designation has been completed. While on site, the waste will be stored in a secure location inside the Permitted Unit.
  - Within 10 days of determining that a non-conforming dangerous waste has been received, BPA will notify the Dangerous Waste Section of the Southwest Regional Office of the Department of Ecology to advise them that a potentially unpermitted waste has been received.
  - If designation efforts confirm that an incoming dangerous waste is covered under Part A of the permit, it will be in-processed and stored in accordance with standard operating procedures. If designation efforts confirm that the waste is not acceptable at the Permitted Unit, the waste will be shipped directly to a facility permitted to accept it.
- **A non-routine or contaminated media dangerous waste stream is received at the Permitted Unit that does not have a current profile according to Section 7.** If the dangerous waste stream is from the Ross Complex, it will be returned to a Ross 90-day area to be properly profiled. Waste streams from facilities other than the Ross Complex will temporarily be stored in Room 102C within its own secondary containment device and physically isolated from other

wastes stored in that room. If it is determined that the material is not one of the permitted waste streams, the Permitted Unit personnel will work with its vendors so that the waste can be transshipped to an off-site permitted TSDF as soon as possible but no later than a maximum of 10 days after the waste designation has been completed. BPA will notify Ecology as noted in the preceding bullet item, above.

If designation efforts confirm that an incoming dangerous waste is covered under Part A of the permit, it will be in-processed and stored in accordance with standard operating procedures.

- **Dangerous Waste is received in a damaged container.** Permitted Unit personnel will repackage the material into a DOT-approved container in the Bulking Room. Any leakage will be cleaned up and placed into the new container or a separate container. If necessary, the Contingency Plan (Section G) will be initiated.

8.8.3. As soon as possible after resolution of a significant discrepancy, Permitted Unit personnel will work with the District Field Environmental Lead and BPA generator location that was the source of the discrepant waste shipment. Likely follow-up actions include supplemental training and working directly with the District Field Environmental Lead and generator location in advance of the next waste shipment to jointly prepare the correct shipping document information.

8.9. Activation of Contingency Plan for Damaged Shipment

8.9.1. If necessary, the Contingency Plan (Section G) will be activated to manage damaged containers received at the Permitted Unit. The criteria for activation of the plan for a damaged shipment do not differ from the normal activation criteria used for any other leaking or damaged container managed on site.

9. Facility Record Keeping [-300(2)(b), -380(1)(c)]

9.1. This section describes the documentation and records that must be maintained by the Permitted Unit to demonstrate compliance with the Dangerous Waste Permit. Table C-8 provides a summary and matrix of records that must be maintained by the Permitted Unit.

9.2. The Permitted Unit's Waste Tracking Database and Information System is a computerized system, custom-built by BPA for the sole purpose of tracking wastes managed at the Permitted Unit. It must be capable of tracking the disposition of all wastes managed through the Permitted Unit, including storage times and locations, as well as all information regarding the final disposition of wastes shipped to off-site TSDFs. The system includes generation of the following types of reports:

- A*d hoc* and annual reports for all wastes sent to Permitted Unit from BPA generator locations and the Ross Complex
- *Ad hoc* and annual reports for all wastes sent to off-site TSDFs by facility or vendor name

- Reports of all waste currently in storage at the Permitted Unit
- Historical reports, sorted by waste code or IWS number, etc.
- Annual dangerous waste reports for the Permitted Unit that are submitted to Ecology
- Significant deviation reports
- Manifest for shipments from the Permitted Unit to off-site TSDFs
- Manifest discrepancy reports

9.3. The HMB Electrical Utility Foreman, Manager, or Data Analyst is responsible for maintaining and updating information in the computerized tracking system. Monthly system backups are copied onto removable electronic media or to the BPA local area network (where system backups are routinely performed by the network administrator).

10. Method for Meeting Additional Waste Analysis Requirements [-300(5)(f)]

Waste analysis procedures in this waste analysis plan meet requirements in WAC 173-303-300(5)(f).

11. Surface Impoundments Exempt from Land Disposal Restriction [-300(5)(h) and 173-303-140(2)]

There are no surface impoundments at the permitted unit, therefore this section is not applicable.

12. Air Emissions Exemption [173-303-400(3)(b)]

12.1. The permitted unit does not meet requirements for an air emissions exemption; therefore this section is not applicable.

Tables – Section C

Table C-1
Principal Waste Codes for Dangerous Wastes
Managed at the Permitted Unit[a]

EPA/Ecology Waste Code	Generic Waste Description	Primary Hazard(s) Recognition for Proper Storage at Permitted Unit	
		Physical[b]	Chemical[c]
D001	Ignitable	L	I, T
D002	Corrosive wastes	L	C
D004	TCLP for Arsenic (As)	L or S	T
D005	TCLP for Barium (Ba)	L or S	T
D006	TCLP for Cadmium (Cd)	L or S	T
D007	TCLP for Chromium (Cr)	L or S	T
D008	TCLP for Lead (Pb)	L or S	T
D009	TCLP for Mercury (Hg)	L or S	T
D010	TCLP for Selenium	L or S	T
D011	TCLP for Silver (Si)	L or S	T
D018	TCLP for Benzene	L or S	T
D035	TCLP for Methyl Ethyl Ketone (MEK)	L	I, T
D039	TCLP for Tetrachloroethylene	L	T
F002	Spent halogenated solvents	L or S	T
F003	Spent non-halogenated solvents	L	I, T
F005	Spent non-halogenated solvents	L	I, T
U226	1,1,1-trichloroethane	L	T
WT01	State-only Toxic Extremely Hazardous Waste	L or S	T
WT02	State-only Toxic Dangerous Waste	L or S	T
WP01	State-only Persistent Extremely Hazardous Waste	L or S	T, I
WP02	State-only Persistent Dangerous Waste	L or S	T, I
WSC2	State-only Solid Corrosive Waste	S	C

Table C-1
Principal Waste Codes for Dangerous Wastes
Managed at the Permitted Unit[a]

EPA/Ecology Waste Code	Generic Waste Description	Primary Hazard(s) Recognition for Proper Storage at Permitted Unit	
		Physical[b]	Chemical[c]

[a] Only waste codes where the estimated annual quantity of wastes managed at the Permitted Unit exceeds 500 pounds are listed in this table. An additional 39 waste codes are included in the Part A application that are not listed in this table. Their estimated annual quantities range from 50 pounds to less than 500 pounds.

[b] Physical Hazards: L=Liquid, S=Solid.

[c] Chemical Hazards: I=Ignitable, T=Toxic, C=Corrosive, R=Reactive.

Table C-2
Multi-User and Location-Specific
Dangerous Waste Stream Re-Characterization Plan

Identified Waste Stream	Description	Analyses Targeted for Re-Profiling
Multi-User Dangerous IWS - Profiles		
IWS 005	Universal Waste Batteries	N/A - Universal Waste
IWS 007	Aerosol Cans	Knowledge of waste (Flashpoint, TCLP metals, Volatiles, Semi-volatiles)
IWS 009	Universal Waste Mercury-Containing Equipment	N/A - Universal Waste
IWS 012	Universal Waste Light Tubes	N/A - Universal Waste
IWS 313	Waste Paint	Knowledge of waste (Flashpoint, Volatiles, Semi-volatiles, TCLP Metals)
IWS 442	Waste battery electrolyte from broken lead acid batteries	Specific Gravity, Flashpoint; pH, TCLP Metals
IWS443	Waste potassium hydroxide from grounding cells	Specific Gravity, Flashpoint; pH
IWS444	Spent molecular sieves; SF6 arc products, contaminated solids[1]	TCLP Metals, pH
IWS445	Non-reusable wood poles[2]	N/A – Knowledge of Waste per RCW 70.105 and WAC 173-303-071(3)(g).
IWS 447	Lead Contaminated Debris	TCLP Metals
IWS 448	Flares	Knowledge of waste (Reactivity, Toxicity)
IWS 451	Waste Flammable/Toxic Liquids (Generic)	Knowledge of waste (Flashpoint, WT02)
Location-Specific Dangerous IWS Profiles		
IWS 246	Rags and sorbents contaminated with non-halogenated solvents	TCLP Metals; Volatiles; Semi-Volatiles; PAH; PCB
IWS 311	Used lacquer thinner	Flashpoint; TCLP Metals; Volatiles; Semi-volatiles; PAH
IWS 341	Paint-contaminated rags	TCLP Metals, Volatiles
IWS 342	Sandblast media[3]	TCLP Metals
IWS 511	Waste isooctane and oil mixture from PCB testing (>500 ppm PCB)	Specific Gravity; Flashpoint; pH; TCLP; PAH; PCB
IWS 512	Sulfuric acid from PCB testing	Specific Gravity, Flashpoint; pH; PCB
IWS 515	Waste Solvents from Chemistry Laboratory	Specific Gravity; Flashpoint; pH; TCLP; Volatiles; Semi-Volatiles; PCB
IWS911	Waste aircraft-cleaning solvents	Specific Gravity; Flashpoint; pH; TCLP; Volatiles; Semi-Volatiles; PAHs;
IWS912	Machine coolant	Specific Gravity; Flashpoint; pH; TCLP Metals; Halogens; PAH

1 Waste stream is generated in closed equipment and only if a catastrophic failure occurs. A sample is available only under catastrophic failure conditions. This has occurred, on average, less than once per year for the past five years.

2 Research has shown that Penta and creosote-treated wood product do not fail the TCLP (EPRI EN 7092, January 1991 & EPRI Technical Brief RP 2485-9, March 1992, RCW 70.105 and WAC 173-303 Oct. 12, 1992 p. 29). Arsenic-treated wood is exempt from Waste Code D004-D017 even if it does fail the TCLP (WAC 173-303-071(3)(g)(i).

[3] Tested each time generated.

Table C-3
Analytical Parameters, Methods, and Rationale[g]

BPA HMB Dangerous Waste Permit
Waste Analysis Plan

Parameter	Method Reference	Rationale
Physical Description	ASTM D4979	Determine variations in waste type, provide semi-quantitative (fingerprint) information to assist in incoming waste verification at Permitted Unit.
Specific Gravity	ASTM C135-96 or C604-18[a]	Determine general chemistry composition, determine variations in waste type, provide information to assist in incoming waste verification at Permitted Unit.
Ignitability Screen	NWTPH-HCID SW-846 Method 8015D Modified[b]	Determine carbon range of hydrocarbons, assess if carbon range is for volatile hydrocarbons, if liquid, determine need to perform Method 1010B.
Flashpoint[c]	SW-846 Method 1010B	(Liquids only) Determine if D001; identify storage limitations, potential incompatibility information, and DOT shipping information.
pH	SW-846 Method 9040C (for aqueous liquids); or SW-845 Method 9045D (for non-aqueous liquids)	Determine if D002, identify container and storage requirements, identify potential incompatibility information, DOT shipping information, provide information to assist in incoming waste verification at Permitted Unit, identify applicability of LDRs for underlying hazardous constituents.
Polycyclic Aromatic Hydrocarbons (PAH)	WDOE criteria; SW-846 Method 8310	Quantify PAHs in organic wastes, compliance with Ecology state-only designation criteria.
PCBs	SW-846 Method 8082A	Determine presence of PCBs in waste.
Total Metals[d]	SW-846 Method 7000B Series	Determine if metals are present that warrant further analysis by TCLP for waste designation/characterization, determination of metal concentrations following TCLP extraction (Method 1311), and LDR compliance.
Total Chlorine[e]	SW-846 Method 9076	Quantify halogenated organics, off-site receiving requirements, Ecology state-only criteria.
Volatile Organic Compounds (VOCs)[d, f]	SW-846 Method 8260D	Determination of organics for possible F-listings, “contained-in” determination for contaminated media, determination of VOC concentrations following TCLP extraction (Method 1311), VOC concentrations for potential 40 CFR 264, Subpart CC air emission standard applicability, and LDR compliance.
Semivolatile Organic Compounds (SVOCs)[d, f]	SW-846 Method 8270E	Determination of organics for possible F-listings, “contained-in” determination for contaminated media, determination of SVOC concentrations following TCLP extraction (Method 1311), and LDR compliance.

Table C-3
Analytical Parameters, Methods, and Rationale[g]

BPA HMB Dangerous Waste Permit
Waste Analysis Plan

Parameter	Method Reference	Rationale
TCLP Extraction	SW-846 Method 1311	Extraction for determination of toxicity characteristic (in conjunction with other chemical analysis such as metals or VOCs), and LDR compliance.
Water Compatibility Screen	ASTM D5058-12 (water compatibility)	Determine potential incompatibility information, identify proper management options during handling and storage.

[a] C604-02 will be used for materials not suitable for C135.

[b] See Attachment C-5 for BPA Chemistry Laboratory Modifications to Method 8015D.

[c] This test is not performed on solids, unless the waste contains free liquids as defined in 40 CFR 260.10, or on liquids that are known by the generator to exhibit the characteristic code of D001 (for example, from an SDS). Flash point is performed as necessary for determination of storage constraints or DOT shipping information.

[d] Analysis performed by a contract laboratory at time of permit application. BPA reserves the right to self-perform this analysis at a future date.

[e] When total chlorine is greater than 1,000 ppm, the waste is analyzed to determine if the waste is an F-listed solvent waste as defined by 40 CFR 261.31 (F001, F002, F003, F004 or F005) (SW-846 8260D).

[f] VOC and SVOC tests must be performed if sample is a complete unknown or if process knowledge or physical appearance (sheen, tarlike appearance, phases, odors etc.) indicate they may be present.

[g] The most current EPA approved SW-846 test method will be used if an update is made during the permit cycle.

Table C-4
Identified Dangerous Waste Streams
Managed at Permitted Unit[a]

IWS No.[b]	Physical State[c]	Waste and Process Descriptions by Major Waste Category	EPA Waste Code(s)	State-Only Waste Code(s)
005	S	Universal Waste Batteries	N/A	
007	L	Aerosol Cans that includes paints, lubes, solvents, cleaners, degreasers and empty cans. No Poisons	D001, D008, D035, D039, D040	WT02, WP02
009	L	Universal Waste Mercury-Containing Equipment	N/A	
012	S	Universal Waste Light Tubes	N/A	
		SOLVENTS AND COMBUSTIBLE WASTES		
246	S	Rags and sorbents contaminated with non-halogenated solvents. NO FREE LIQUIDS. LDR Notification form required.	F003, F005, D035	
		PAINT RELATED WASTES		
311	L	Used lacquer thinner. May include some paint pigment residues. LDR Notification form required.	D001, D035, F003, F005	
313	L	Waste Paint that includes alkyds, epoxies, lacquers, enamels, polyurethanes, acrylics, polysiloxanes, zinc coatings, sealers, stains, and adhesives	D001, D005, D006, D007, D018	
341	S	Paint-contaminated rags and sorbents used in paint cleanup projects. NO FREE LIQUIDS OR SOLVENTS. LDR Notification form required.	D018, D035, F003, F005	
342	S	Spend sandblast media and paint chips contaminated with heavy metals. NO FREE LIQUIDS. LDR Notification form required.	D006, D007, D008, D009	

Table C-4
Identified Dangerous Waste Streams
Managed at Permitted Unit[a]

IWS No.[b]	Physical State[c]	Waste and Process Descriptions by Major Waste Category	EPA Waste Code(s)	State-Only Waste Code(s)
		MISCELLANEOUS WASTES		
442	L	Waste battery electrolyte (sulfuric acid solution from lead batteries). DO NOT ADD ALKALINE TYPE ELECTROLYTE. LDR Notification form required.	D002, D008	WT02
443	L	Waste potassium hydroxide (KOH) electrolyte from grounding cells and alkaline batteries. LDR Notification form required.	D002	
444	S	Spent molecular sieves, activated alumina, sulfur hexaflouride (SF6) arc products, and contaminated solids such as HEPA filters, granular desiccants, etc. LDR Notification form required.	D005, D007, D011	
447	S	Lead Contaminated Debris that includes PPE, paint chips, filters, rags, or dust	D008	WT02
448	S	Flares from miscellaneous vendors	D001, D003	WT02
451	L	Waste Flammable/Toxic Liquids (Generic). Flammable and/or state only toxic (WT02) liquids that do not have any other dangerous characteristics	D001	WT02
		LABORATORY WASTES		
511	L	Isooctane and oil from PCB Testing. LDR Notification form required.	D001	
512	L	Sulfuric acid from PCB analysis. LDR Notification form required.	D002	
513	L	Waste non-pyridine Karl Fischer Reagent and oil from water testing (contains small quantities of flammable liquids). LDR Notification form required.	D001, D022	
514	L	Spent titrating solution consisting of a 50/50 mixture of toluene and isopropanol used in testing for neutralization number. LDR Notification form required.	D001, F005	
515	L	Waste Solvent from Chemistry Laboratory that includes acetone, acetonitrile, hexanes, methanol, 2-propanol, xylene	D001,D003 F003, F005	WT02

Table C-4
Identified Dangerous Waste Streams
Managed at Permitted Unit[a]

IWS No.[b]	Physical State[c]	Waste and Process Descriptions by Major Waste Category	EPA Waste Code(s)	State-Only Waste Code(s)
		GARAGE WASTES		
713	L	Spent antifreeze. No brake or power steering fluid.		WT02
		MISCELLANEOUS SITE-SPECIFIC WASTES		
911	L	Waste solvents generated from cleaning aircraft. Mixture of Chevron 325 Thinner, Toluene, and Methyl Ethyl Ketone. (No 1,1,1-Trichloroethane) LDR Notification form required.	D001, D035, F005	
912	L	Machine Coolant (water miscible cutting and grinding fluid). LDR Notification form required.		WP01

Notes:

[a] Information contained in this table is based upon information contained in the *Identified Waste Stream Handbook* and is subject to revision and amendment by BPA when the waste stream changes. Specific information regarding prior analysis, process knowledge, LDR notification information, labeling, and manifesting requirements is contained in the individual tabbed section for each waste in the IWS Handbook.

[b] Identified Waste Stream number from the Identified Waste Stream Handbook.

[c] L=Liquid, S=Solid.

Table C-5 Waste Storage Locations BPA HMB Dangerous Waste Permit					
IWS No.	**EPA Hazardous Waste Number**	**State-Only Dangerous Waste Number**	**IWS No.**	**EPA Hazardous Waste Number**	**State-Only Dangerous Waste Number**
Room 100 Ignitable Waste Storage Area			**Room 102 D Toxic Waste Storage**		
007	D001, D008, D035, D039, D040	WT02, WP02	**---**	D004, D009, D010 D011, D037, D022, F001, F002, U226, WT01	
311	D001, D035, F003, F005		**009**	Universal Waste Mercury Equipment	
312	D001, D007, D008, D018, D035, F005		**012**	Universal Waste Light Tubes	
313	D001, D005, D006, D007, D008, D018		**246**	F003, F005, D035	
448	D001, D003	WT02	**341**	D018, D035, F003, F005	
451	D001	WT02	**342**	D006, D007, D008, D009	
511	D001	WP02	**444[a]**	D005, D007, D011	WSC2, WT02
515	D001, D003, F003, F005	WT02	**447**	D008	WT02
911	D001, D035, F005		**713**		WT02
			912		WP01
Room 102 A Corrosive Waste Storage – Acids (pH ≤ 2.0)			**Room 102 B Corrosive Waste Storage – Bases (pH ≥ 12.5)**		
442	D002, D008	WT02	**443**	D002	
512	D002	WT02	---		
005	Universal Waste Batteries				
[a] When received, this waste must be stored within its own, self-contained secondary containment device, and it must be physically isolated from other wastes stored in this room.					

Table C-6
Identified Waste Streams
Potential Container Storage Incompatibilities

IWS No.	Ø[a]	Potentially Incompatible Waste Streams	Storage Precautions
007		442, 443, 512	Keep away from open flame, sparks, and heat.
246	∅	442, 443, 512	Keep rags in tightly closed metal containers to avoid danger of spontaneous combustion.
311	∅	442, 443, 512	May react with strong oxidizers, acids, amines. Avoid open flames or sparks.
312	∅	442, 443, 512	May react with strong oxidizers, acids, amines. Avoid open flames or sparks.
313	∅	442, 443, 512	May react with strong oxidizers, acids, amines. Avoid open flames or sparks.
341	∅	442, 443, 512	May react with strong oxidizers, acids, amines. Avoid open flames or sparks.
342		--	
442	∅	007, 246, 311, 312, 313, 341, 443, 445, 448, 451, 511, 513, 713, 912	Contact with acids, caustics, reactive metals, cyanides, oxidizers, or chlorinated solvents may generate toxic/flammable gases, fire, or explosion.
443	∅	007, 246, 311, 312, 313 341, 442, 448, 451, 511, 512, 513, 713, 912	Contact with acids, caustics, reactive metals, cyanides, oxidizers, or chlorinated solvents may generate toxic/flammable gases, fire, or explosion.
444		--	May react violently when mixed with water. Contact with cyanides, sulfides, or reactive metals may generate toxic/flammable gases.
445		--	
447		--	
448		442, 443, 512	Keep away from open flame, sparks, and heat.
451		442, 443, 512	May react with strong oxidizing materials. Keep away from open heat, sparks or flame.
511		442, 443, 512	May react with strong oxidizers, acids, amines. Avoid open flames or sparks.
512	∅	007, 246, 311, 312, 313, 341, 443, 445, 448, 451, 511, 513, 713, 912	Contact with acids, caustics, reactive metals, cyanides, oxidizers, or chlorinated solvents may generate toxic/flammable gases, fire, or explosion.

Table C-6
Identified Waste Streams
Potential Container Storage Incompatibilities

IWS No.	∅[a]	Potentially Incompatible Waste Streams	Storage Precautions
515		442, 443, 512	May react with strong oxidizers. Keep away from open flame, sparks, and heat.
713	∅	442, 443, 512	May react with strong oxidizers and acids.
911	∅	442, 443, 512	May react with strong oxidizers. Keep away from open flame, sparks, and heat.
912	∅	442, 443, 512	May react with strong oxidizers and acids.

[a] ∅ - Identified waste stream in first column is potentially incompatible with the identified waste stream(s) identified in the third column, due to potential heat generation, fire, toxic gas generation, or flammable gas generation

Table C-7 Waste Verification Analytical Parameters, Methods, and Rationale		
BPA HMB Dangerous Waste Permit Waste Analysis Plan		
Parameter	**Method Reference**	**Rationale**
Tier I Verification ALL CONTAINERS		
Acceptable Waste?	(No Standard SW-846 or ASTM method)	Verify that waste codes on shipping papers are listed in Part A of the facility permit and that the waste stream has a current profile.
Shipping Papers & Labels	(No Standard SW-846 or ASTM method)	Cross-reference shipping papers and container labels to ensure they match. Are shipping papers legible and complete?
Visual Inspection of Waste	ASTM D4979 (visual assessment only)	Open lid or bung and visually inspect the waste (This step is not performed with respiratory health hazard wastes such as asbestos-containing waste). If necessary, obtain a grab or thief sample for visual inspection. Replace unused grab sample in container and close container.
If no discrepancies were noted, move waste to appropriate storage room. If discrepancies noted, go to Tier II OR if Container is subject to full waste verification go to Tier II		
Tier II Verification FOR CONTAINERS SUBJECT TO VERIFICATION CONDITIONS PER SECTION C.8.1.4		
Physical Description	ASTM D4979	Cross-reference verification check for waste “as-received” at Permitted Unit compared to physical description on Chemical Waste Profile. If waste is multi-layer, or multi-phase, determine description of each layer or phase. Collect a representative grab sample of the waste using an appropriate sampling device: – Free-flowing liquids and slurries – Composite Liquid Waste Sampler (COLIWASA) – Sludges – Trier – Moist powders or granules – Trier – Dry powders or granules – Thief – Sand or packed powders and granules – Hand Auger – Large-grained solids – Large Trier Replace unused grab sample in container and close container.
Specific Gravity	ASTM C135-96(2022) or C604-18[a]	Select appropriate ASTM Method for waste type. Cross-reference verification check for waste “as-received” at Permitted Unit compared to specific gravity on Chemical Waste Profile. If waste is multi-layer, or multi-phase, determine for each layer or phase.

Table C-7 Waste Verification Analytical Parameters, Methods, and Rationale		
BPA HMB Dangerous Waste Permit Waste Analysis Plan		
Parameter	**Method Reference**	**Rationale**
pH	SW-846 Method 9040C, or Method 9041A	Liquids only and non-oily waste streams. Cross-reference check for waste "as-received" at Permitted Unit compared to pH on Chemical Waste Profile. Verify D002 designation and Permitted Unit storage requirements.
Ignitability Screen (IS)	Portable Confined Space Gas Detector Screen [b,c] (No Standard SW-846 or ASTM method)	Liquids Only. Qualitative test to evaluate for the presence of volatile organic constituents that may be present at concentrations to warrant flashpoint testing using EPA Method 1010B (see Tier III, below). This instrument will be used for a Negative or Positive reading only, it is not value dependent. A reading of 0 to 1% LEL verifies documentation of a "nonflammable" waste. An instrument reading of greater than 1% LEL will require follow-up by Method 1010. (The BPA environmental analytical laboratory may perform a test for flashpoint using EPA Method 1010B in place of the portable confined space gas detector.)
Headspace Volatile Organic Vapor Measurement	Portable Photo Ionization Detector (PID) Screen [c, d] (No Standard SW-846 or ASTM Method)	Cross-reference verification of applicability of container management standards under 40 CFR 264 Subpart CC Air Emission Standards, qualitative check on applicability of LDR underlying hazardous constituents. A reading of 10 ppm or greater will require follow-up analysis using Tier III verification. The BPA environmental analytical laboratory may perform a test for volatile and semi-volatile organic compounds using EPA Method 8260D and 8270E in place of the PID.
Chlorinated Hydrocarbon Screen	Chlor-D-Tect 1000 [e]	Oils/Solvents Only. Cross-reference verification for chlorinated organics in oils and solvent waste. Verify F-code waste designations, and qualitative check on applicability of LDR underlying hazardous constituents. The BPA environmental analytical laboratory may perform a test for volatile organic compounds using EPA Method 8260D in place of Chlor-D-Tect tests.
Waste Compatibility Screen	ASTM D5058 (commingled wastes)	Wastes to be Bulked/Consolidated Only. Test must be performed to confirm compatibility of drummed wastes that will be commingled and bulked in the Bulking Room.
Verification Complete if no discrepancies are observed. If a discrepancy is observed, move to Tier III.		

Table C-7 Waste Verification Analytical Parameters, Methods, and Rationale		
BPA HMB Dangerous Waste Permit Waste Analysis Plan		
Parameter	**Method Reference**	**Rationale**
Tier III Verification Follow-up Analysis on Case-by-Case Basis		
Flash Point	SW-846 Method 1010	Liquids Only. Follow-up test to Tier II Headspace LEL Measurement to determine if a designated non-D001 waste is actually D001. Performed on incoming wastes if LEL reading was greater than 1% LEL *and* the waste is not already designated as D001.
Volatile Organic Compounds (VOCs)[f]	SW-846 Method 8260D	Follow-up test for Headspace Volatile Organic Vapor Measurement or Chlorinated Hydrocarbon screen to determine if specific VOCs may be present that have not been identified on Chemical Waste Profile. If PID exceeds 10 ppm or Chlorinated Organics Screen results exceed 1,000 ppm, *and* specific VOCs have not been listed on Chemical Waste Profile, sample and analyze for specific VOC constituents for possible F-listings, “contained-in” determination for contaminated media, determination of VOC concentrations following TCLP extraction (Method 1311), VOC concentrations for potential 40 CFR 264, Subpart CC air emission standard applicability, and LDR compliance.
Semivolatile Organic Compounds (SVOCs)[f]	SW-846 Method 8270E	Follow-up test for Chlorinated Hydrocarbon screen to determine if specific SVOCs may be present that have not been identified on Chemical Waste Profile. If Chlorinated Organics Screen results exceed 1,000 ppm, *and* specific SVOCs have not been listed on Chemical Waste Profile, sample and analyze for specific SVOC constituents for possible F-listings, “contained-in” determination for contaminated media, determination of SVOC concentrations following TCLP extraction (Method 1311), and LDR compliance.
TCLP Extraction	SW-846 Method 1311	Extraction for determination of toxicity characteristic (in conjunction with metals, VOC, or SVOC analysis), and LDR compliance.

Table C-7
Waste Verification Analytical Parameters, Methods, and Rationale

BPA HMB Dangerous Waste Permit
Waste Analysis Plan

Parameter	Method Reference	Rationale

[a] C604-02 will be used for materials not suitable for C135.

[b] Lower Explosive Limit (LEL) headspace vapor measurement using a handheld LEL/O_2 combustible gas detector. Reading can be taken directly by inserting probe into open drum bung (above liquid surface), or performed concurrently with headspace vapor measurement (below). Instrument shall be GasTech, Inc., GasTech Model GT-201, or equivalent combustible gas detector. Instrument calibration, operation, and maintenance will be performed in accordance with manufacturer's operating guidelines.

[c] As required by the manufacturer's specifications, this instrument will be calibrated in the environment to be used. Verification procedures identified in Tier I and II will be performed either inside at the Permitted Unit or inside the BPA environmental analytical laboratory at the Ross Complex.

[d] Headspace vapor measurements using a handheld Photo Ionization Detector (PID) (typical unit: MiniRAE Plus® or MultiRAE® manufactured by the Ben Meadows Company, or equivalent) will be performed on all containers undergoing verification analysis. An aliquot of the grab sample will be placed in a 4-ounce glass container until approximately half full. The mouth of the container will be covered with aluminum foil prior to replacing the cap. The sample will be allowed to equilibrate to room temperature for a minimum of 30 minutes. PID measurements will be made by removing the cap and pushing the 10.6 eV PID probe through the foil cover. The PID will be calibrated in accordance with the manufacturer's recommendations with standard gases such as 100 ppm Isobutylene. Measurements for volatile organic compounds will be directly read in ppm with a nominal detection range between 0.1-1,999 ppm.

[e] Chlor-D-Tect 1000 is a screening test kit manufactured by Dexil (or equivalent). This test kit determines if chlorinated hydrocarbon contamination is greater than 1,000 ppm.

[f] Analysis performed by a contract laboratory at time of permit application. BPA reserves the right to self-perform this analysis at a future date.

Table C-8
Records Management Matrix [WAC 173-303-380]

BPA HMB Dangerous Waste Permit
Waste Analysis Plan

Record Name	Record OR Materials inside folder	Location	Retention Time
Contingency Plan	Official Copy of Dangerous Waste Contingency Plan	HMB Office	Final Closure
Electronic Tracking Documentation	Waste Tracking and Shipping Documentation Description and Quantity of Each Waste Received and Stored at the Permitted Unit Location of Each Dangerous Waste Within the Permitted Unit	BPA Computer Network Accessed by Each Unit Within the Permitted Unit	Final Closure
Part B Permit	Official Copy of Dangerous Waste Permit (Includes Closure/Post Closure Estimates)	HMB Office	Final Closure
Training Records	Training Sign-In Sheets – OJT	OJT at HMB Office Others in Human Resource Management Information System (HRMIS)	Final Closure
	Training Certificates	HMB Office	Final Closure
Records of Completion	Electronic File Only	BPA Electronic Records System – HRMIS	Final Closure
Generator Site Visit Records	Documentation of Site Visits	HMB Office	Final Closure
Waste Received	Waste Profiles of Dangerous Waste Received at Permitted Unit, Filed by Facility Name, Includes: • Waste Analysis/Waste Designations • Container Log Sheet • Waste Verification Documentation and Results • Manifests if applicable • Manifest discrepancy reports if applicable	HMB Office Archived after 10 years	Final Closure[a]

Table C-8
Records Management Matrix [WAC 173-303-380]

BPA HMB Dangerous Waste Permit
Waste Analysis Plan

Record Name	Record OR Materials inside folder	Location	Retention Time
Dangerous Waste Shipments To Off-Site TSDFs	Manifests & Discrepancy Reports Certificates of Disposal/Destruction/Recycling Significant deviation reports	HMB Office Archived after 10 years	Final Closure
Other Disposal/Recycling Records	Universal Waste Shipment Records	HMB Office Archived after 10 years	Final Closure
Inspection Records	Daily Inspection Logs Weekly Inspection Logs Monthly Inspection Logs Documentation of Repairs Resulting from Inspections Annual International Fire Code Inspection	HMB Office Archived after 10 years	Final Closure
Annual Reports	Annual Reports of Dangerous Waste Managed at the Permitted Unit.	HMB Office Archived after 10 years	Final Closure
Spill And Leak Reports	Summary Reports and Details of Any Incidents That Required Implementation of the Contingency Plan	HMB Office	Final Closure

[a] Retention time of 50 years is from year generated. Documents will be returned to the Permitted Unit at the end of the archive retention period. They will not be destroyed without consent of Permitted Unit personnel.

Figures – Section C

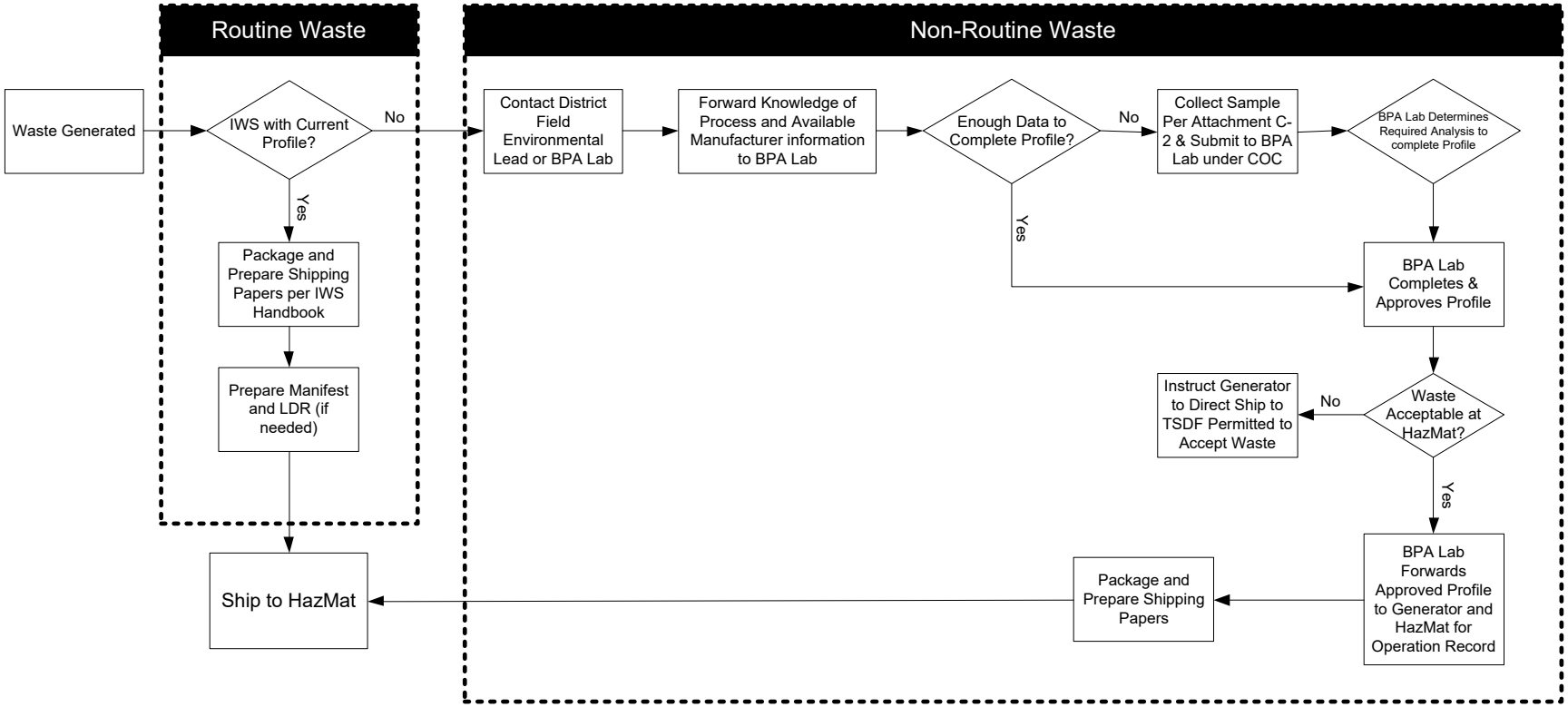


Figure C-1
Waste Profiling & Acceptance Process Flow
Ross Part B Permit Renewal Application

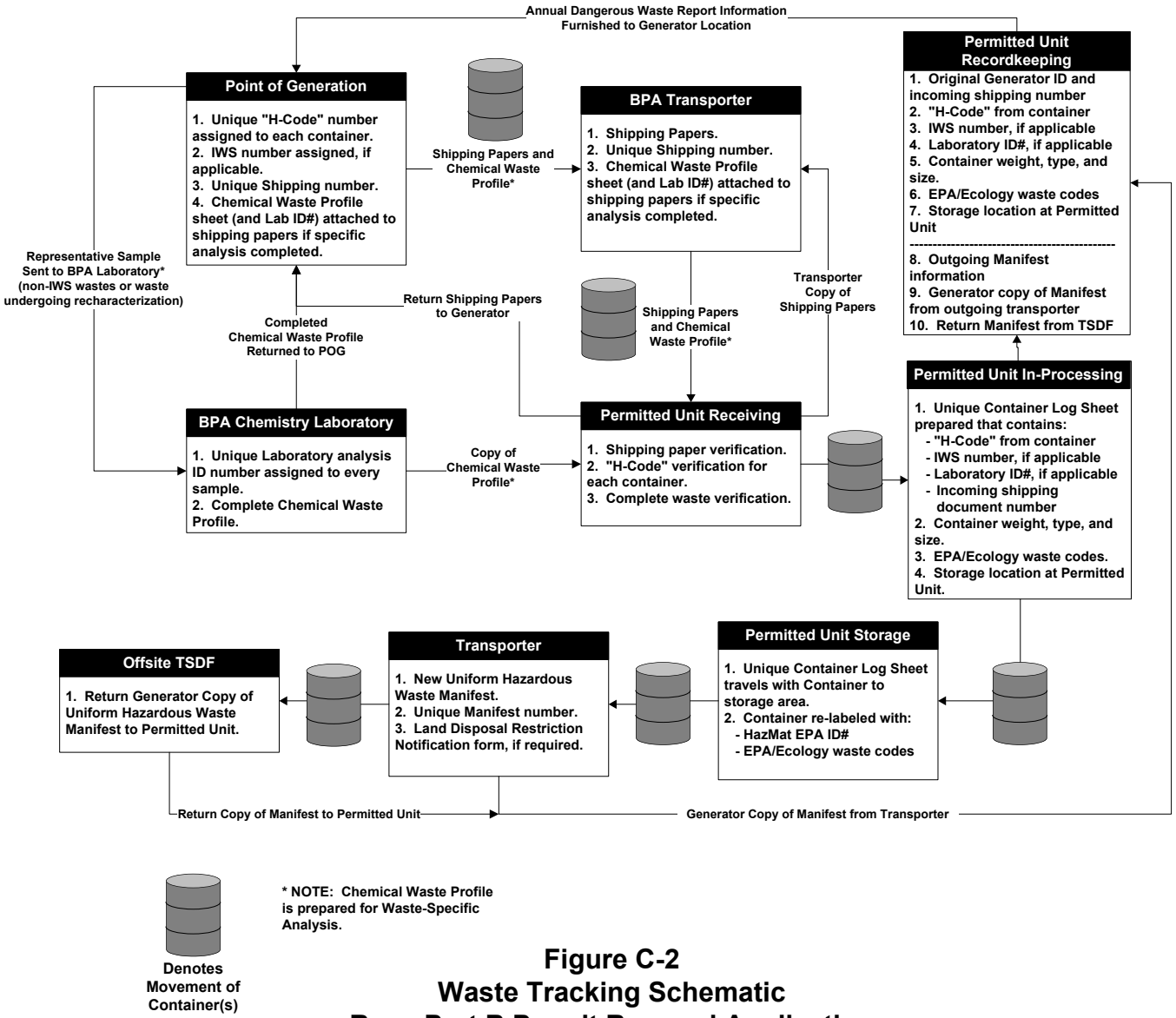
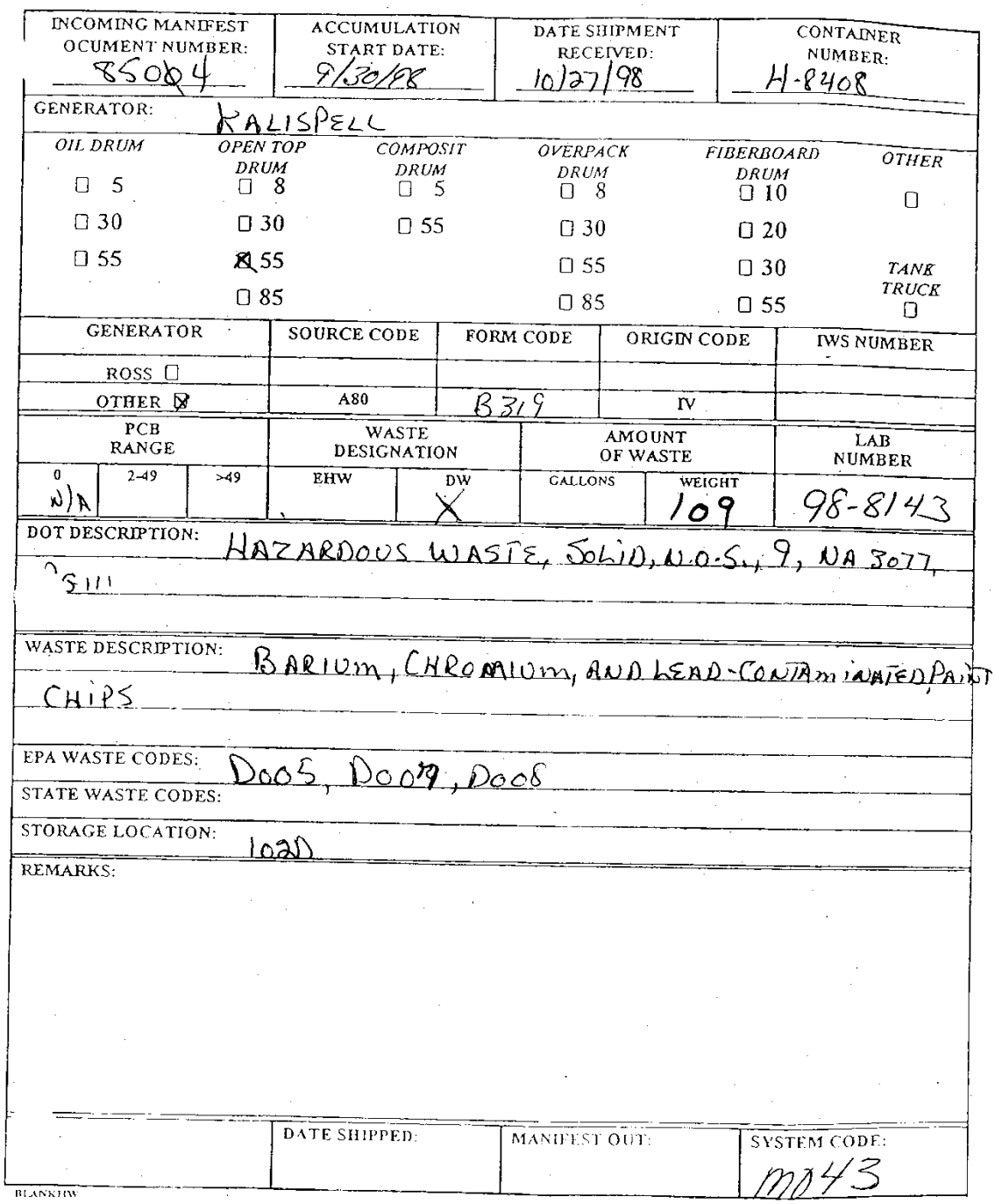


Figure C-2
Waste Tracking Schematic
Ross Part B Permit Renewal Application



INCOMING MANIFEST OCUMENT NUMBER:	ACCUMULATION START DATE:	DATE SHIPMENT RECEIVED:	CONTAINER NUMBER:
85084	9/30/98	10/27/98	H-8408

GENERATOR: KALISPELL

OIL DRUM	OPEN TOP DRUM	COMPOSIT DRUM	OVERPACK DRUM	FIBERBOARD DRUM	OTHER
☐ 5	☐ 8	☐ 5	☐ 8	☐ 10	☐
☐ 30	☐ 30	☐ 55	☐ 30	☐ 20	
☐ 55	☒ 55		☐ 55	☐ 30	TANK TRUCK
	☐ 85		☐ 85	☐ 55	☐

GENERATOR	SOURCE CODE	FORM CODE	ORIGIN CODE	IWS NUMBER
ROSS ☐				
OTHER ☒	A80	B319	IV	

PCB RANGE			WASTE DESIGNATION		AMOUNT OF WASTE		LAB NUMBER
0 N/A	2-49	>49	EHW	DW	GALLONS	WEIGHT	
				X		109	98-8143

DOT DESCRIPTION: HAZARDOUS WASTE, SOLID, N.O.S., 9, NA 3077, ^SIII

WASTE DESCRIPTION: BARIUM, CHROMIUM, AND LEAD-CONTAMINATED PAINT CHIPS

EPA WASTE CODES: D005, D007, D008

STATE WASTE CODES:

STORAGE LOCATION: 1020

REMARKS:

	DATE SHIPPED:	MANIFEST OUT:	SYSTEM CODE:
			MD43

BLANKHW

Figure C-3
Sample Container Tracking Log Sheet
Ross Part B Permit Renewal Application

(This form is an example only. The information contained on the form will be included on any version of the form used for the same purposes, although the forms themselves may change in appearance.)

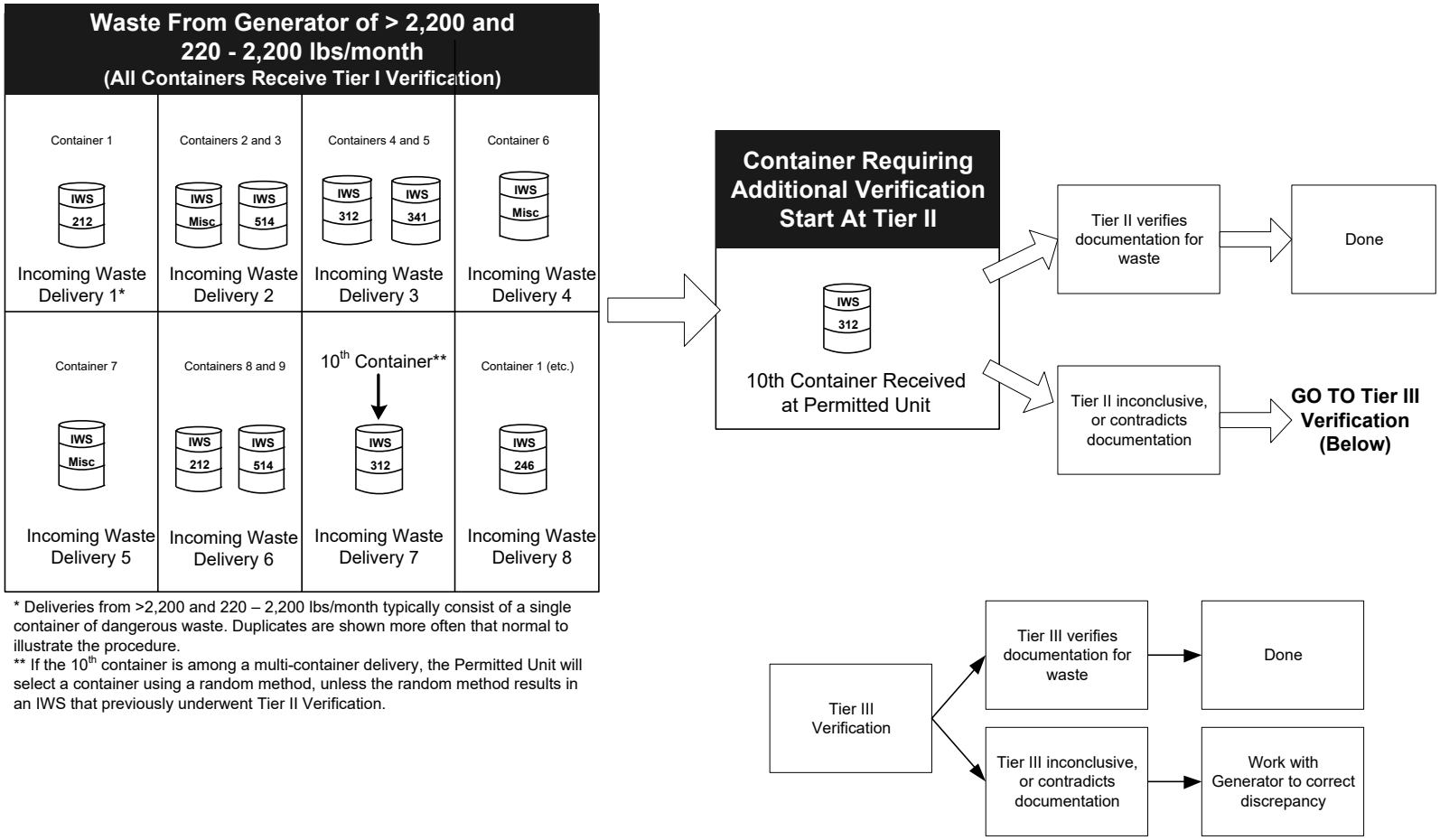


Figure C-4
Waste Verification Flow Schematic
Generators of >2,200 and 220 - 2,200 lbs/month
Ross Part B Permit Renewal Application

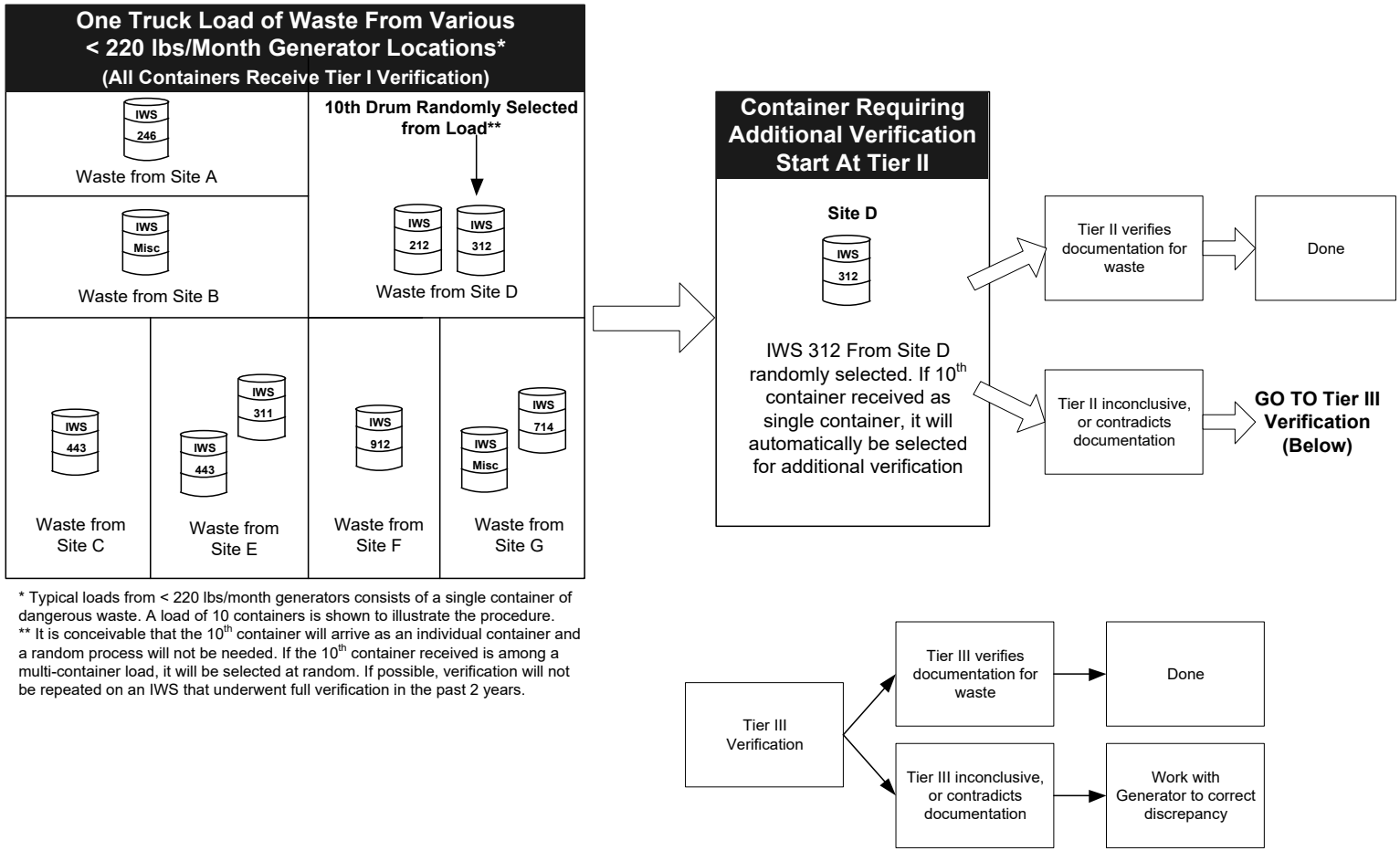
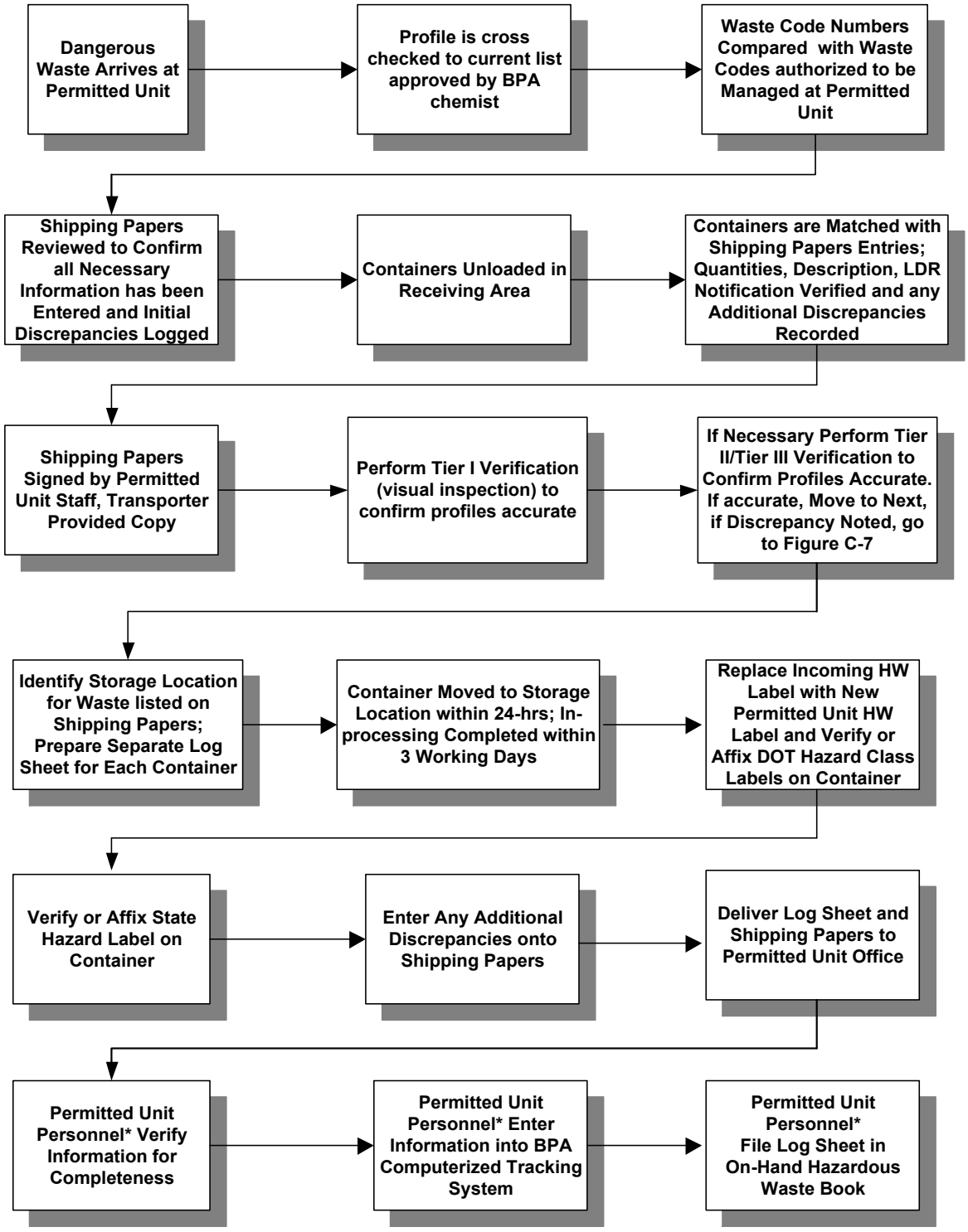


Figure C-5
Waste Verification Flow Schematic
Generators of < 220 lbs/month
Ross Part B Permit Renewal Application

WA189140639



*Performed by HazMat Data Analyst, Electric Utility Foreman, Manager, or District Field Environmental Lead

Figure C-6
Dangerous Waste Process Flow Schematic
Ross Part B Permit Renewal Application

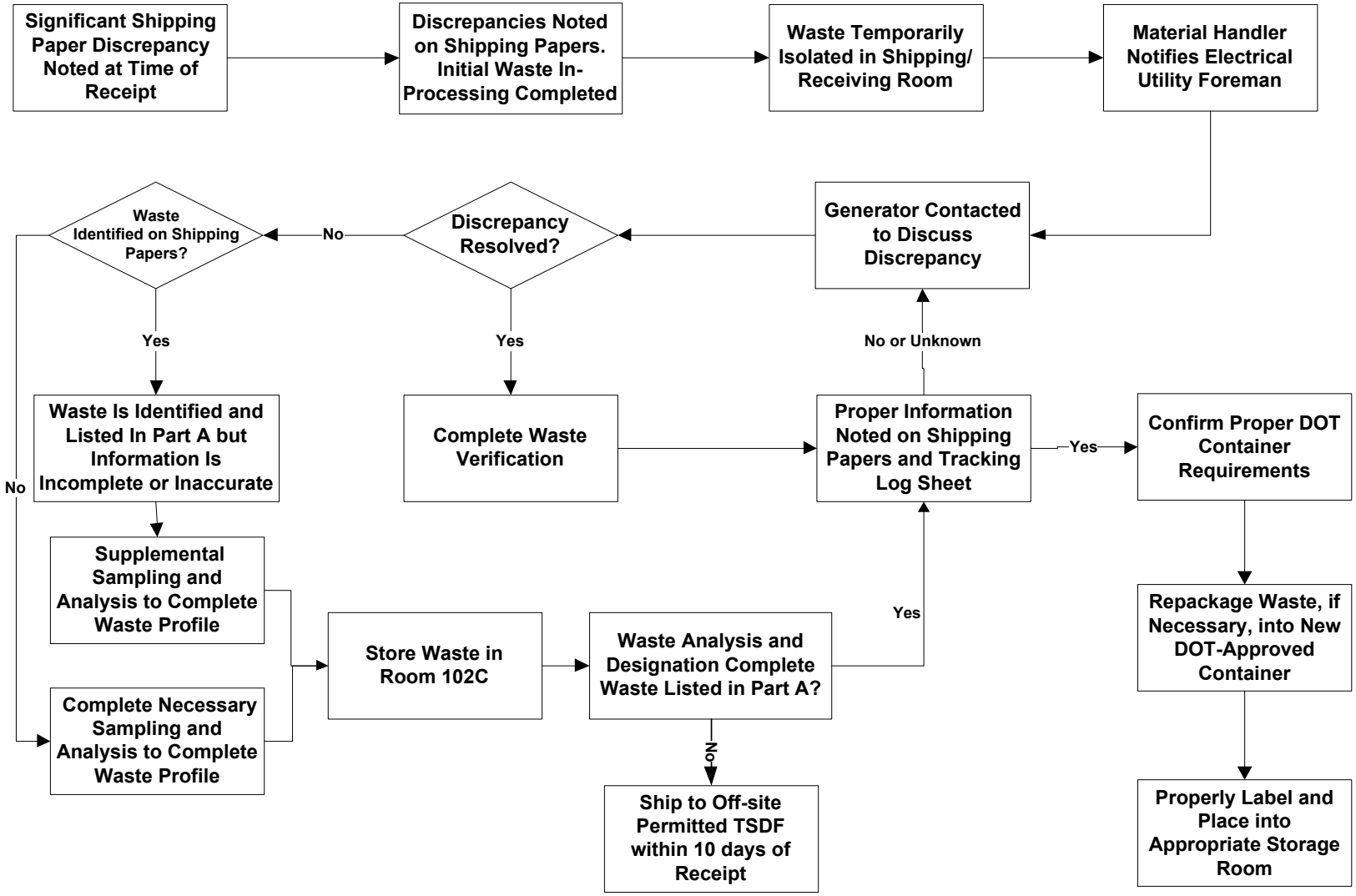


Figure C-7
Procedures for Responding to Significant Waste Discrepancies
Ross Part B Permit Renewal Application

Attachments – Section C

Attachment C-1

Sample Identified Waste Stream Profile Kit

The table and forms included in this appendix are for example only as they are part of the IWS Handbook that may undergo changes. The information contained on the forms will be included on any version of the forms used for the same purposes, although the forms themselves may change in appearance.

Used Lacquer Thinner

Waste Stream Number	IWS-311
Waste Stream Description	Used Lacquer Thinner **INCLUDES**: Some paint pigment residues
Regulatory Status	• **HAZARDOUS** • **DOES COUNTS** towards facility generator status
Packaging Instructions	Allow room in drum for expansion Package in appropriately sized Closed Top (Bung Head) Drums: ○ 5-gallon, bung head BPA Catalog #: 824675 ○ 30-gallon, bung head. BPA Catalog #: 824653 ○ 55-gallon, bung head. BPA Catalog #: 824655
Testing Requirements	None (View generic profile)
Labeling Instructions	• Hazardous Waste Label ○ BPA catalog #: 793050 • Washington State Toxic Label ○ BPA catalog #: 1025151 • Class 3 Diamond Label ○ BPA catalog #: 793054 • IWS 311 Silver Label ○ BPA catalog # 793062
Storage Precautions	May react with strong oxidizing materials. Keep away from open heat, sparks or flame.

Shipping Instructions	• Go to BES Shipping Module • Click on NEW WASTE • Select appropriate waste stream from drop down menu • Fill in applicable information • Click SAVE • Click SEND REQUEST • Click PRINT



1



2

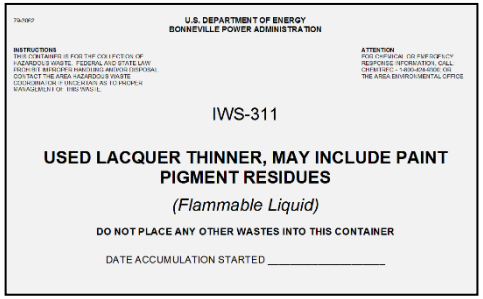


3



EPA WASTE NO.
D001, D035, F003, F005
DOT PROPER SHIPPING NAME
Waste, UN 1263, Paint related material (flammable, toxic), 3, PGII

4



BPA F 5472.64e
(08-10)
(Previous editions unusable)

U.S. DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION

Electronic Form Approved
By Forms Mgmt. 08/25/2010

CHEMICAL WASTE PROFILE

WASTE IDENTIFICATION NUMBERS	
LAB REPORT NUMBER	
HAZMAT ID NUMBER	
IDENTIFIED WASTE STREAM NUMBER	IWS 311

GENERATOR INFORMATION

REQUESTER'S NAME	PHONE NUMBER *(Include Area Code)*	ORG. CODE	SITE OF GENERATION
Generic Profile – BPA Generators			

WASTE INFORMATION ***(Supplied by Generator)***

NAME OF WASTE Used Lacquer Thinner (may contain some paint pigment residues)

ORIGIN OF WASTE Ross Paint Shop

VOLUME AND COMPOSITION OF WASTE Varies

TYPE AND SIZE OF CONTAINER Varies

ANALYTICAL RESULTS ***(Including Methods and Detection Limits Where Appropriate)***

	DESCRIPTION	ANALYSIS RESULTS	TEST METHOD	DETECTION LIMIT
Physical Characteristics	Color	Grey		
	Odor	Paint		
	Physical State	Liquid		
	Layers			
	Other			
EPA/WDOE Characteristics	Specific Gravity	0.869		
	Ignitability	Flashpoint ≤ 20°C (68°F)	ASTM D93	
	Corrosivity	pH = 8	EPA SW-846 9045D	
	Reactivity	N/A		
	TCLP Metals	Below Regulatory Limits	EPA SW-846 1311/6020	
	Toxicity			
Gross ID	TCLP VOC	Methyl ethyl ketone (MEK) ≥ 200 mg/L	EPA SW-846 1311/8260D	
	Total VOC	Below Regulatory Limits	EPA SW-846 8260D	
	SVOC	Below Regulatory Limits	EPA SW-846 8270E	
WDOE Persistent Chemicals	Halogenated Hydrocarbons	N/A	EPA SW-846 9023	
	Polycyclic Aromatics	Below Regulatory Limits	EPA SW-846 8270E	
TSCA	PCB Assay	N/A	ASTM D4059	
Other (specify)				
UHC		Acetone Toluene		
		Benzene Xylenes		
		Ethylbenzene		
		Methyl isobutyl ketone		
		Methanol		
		Naphthalene		

COMMENTS	LAB BPA ID NUMBER	WO	TASK	ABM
Profiled in BPA Chemistry Lab Report No. TEST-13-1082				
		QC VERIFICATION: BT		
	PROFILE APPROVED BY *(Signature)*	PROFILE CERTIFICATION DATE: 3/24/2024		
RECORD NUMBER				

FILE CODE: EQ-20-11
RETENTION: KEP/Z = A + 50 YRS; OTHERS = S

BPA F 5472.63e
(08-10)
(Previous editions unusable)

U.S. DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION

Electronic Form Approved
by Forms Mgmt. 08/25/2010

SHIPPING INFORMATION

WASTE IDENTIFICATION NUMBERS	
LAB REPORT NUMBER	
HAZMAT ID NUMBER	
IDENTIFIED WASTE STREAM NUMBER	IWS 311

US DOT DESCRIPTION *(Box 11 on Manifest)*

DOT SHIPPING NAME

Waste, UN1263, Waste paint related material, (flammable, toxic), 3, PGII

TECHNICAL NAME/ADDITIONAL WASTE DESCRIPTION	REPORTABLE QUANTITY *(RQ)*
Lacquer thinner	**45.4 kg (100 lbs)**
IS THIS WASTE ACCEPTABLE AT BPA HAZMAT? ☒ YES ☐ NO	

WASTE NUMBER *(Shaded Box 1 on Manifest)*		DOT EMERGENCY RESPONSE INFORMATION *(Box K)*
EPA WASTE CODES	STATE WASTE CODES	EMERGENCY RESPONSE GUIDEBOOK NUMBER
D001, D035, F003, F005	**WT02**	**127**

LAND DISPOSAL RESTRICTION NOTIFICATION FORM *(LDR)*	EMERGENCY CONTACT
☒ REQUIRED ☐ NOT REQUIRED	**1-800-424-9300**

REQUIRED LABELS AND MARKINGS

☒	YELLOW HAZARDOUS WASTE LABEL	☒		MARKINGS: GREEN CHARACTERS LABEL
☒	DIAMOND HAZARD LABEL		☒	TOXIC
☒	3 *(Flammable)*		☐	PERSISTENT
☐	6 *(Poison)*		☐	REACTIVE *(D003)*
☐	6 *(Harmful - Stow Away from Food Stuffs)*		☐	CORROSIVE *(D002)*
☐	8 *(Corrosive)*		☒	IGNITABLE *(D001)*
☐	9 *(Environmentally Hazardous Substance)*			
☐	Other *(Specify)*			
☐	PCB Markings			
☐	EPA *(Yellow "Caution - Contains PCBs" Label)*	☐		Other *(Specify)*
☐	BPA *(White "PCB Content" Label)*			

WASHINGTON CODES	
SOURCE CODE:	**G06**
FORM CODE:	**W209**
ORIGIN CODE:	**i (Recurrent)**
MM CODE:	**H141**

TYPE OF WASTE	
RCRA HAZARDOUS WASTE	☒
TSCA WASTE (PCB)	☐
WASHINGTON DANGEROUS WASTE	☒
EXTREMELY HAZARDOUS WASTE	☐
OREGON HAZARDOUS WASTE	☐
NON-HAZARDOUS WASTE	☐

ADDITIONAL WASTE SPECIFIC INFORMATION

-

PRECAUTIONS

- **Keep away from strong oxidizing materials**
- **Keep away from sources of ignition and high temperature**

FILE CODE: TT-12-13
RETENTION: See BPA Records Manual

Miscellaneous Waste

BONNEVILLE POWER ADMINISTRATION (BPA)
LAND DISPOSAL RESTRICTION NOTIFICATION

UNIQUE IDENTIFICATION NUMBER: IWS 311

WASTE DESCRIPTION: Used lacquer thinner

BPA GENERATOR SENDING WASTE: _____
ADDRESS: _____
EPA ID No.: _____ **CONTACT NAME:** _____
DATE: _____ **PHONE NUMBER:** _____
WASTE SHIPMENT MANIFEST NUMBER: _____

RESTRICTED WASTE INFORMATION

TREATABILITY GROUP: NWW*

EPA HAZARDOUS WASTE NUMBER	WASTE SUBCATEGORY
D001	High TOC
D035	TCLP
F003	N/A
F005	N/A

UNDERLYING HAZARDOUS CONSTITUENTS
Acetone
Benzene
Ethylbenzene
Methanol
Methyl isobutyl ketone
Naphthalene
Toluene
Xylenes

* WW = "Wastewater"
NWW = "Non-Wastewater"

Waste Paint

Waste Stream Number	IWS-313
Waste Stream Description	Miscellaneous waste paint and coating products including: alkyds, epoxies, lacquers, enamels, polyurethanes, acrylics, polysiloxanes, zinc coatings, sealers, stains, and adhesives.
Regulatory Status	• **HAZARDOUS** • **DOES COUNT** towards facility generator status
Packaging Instructions	Place non-leaking paint containers less than 5 gallons into one of the following (or similar) DOT compliant containers: ○ 8-gallon open head; BPA Catalog # 824645 ○ 30-gallon open head; BPA Catalog # 824651 ○ 55-gallon open head; BPA Catalog # 824650 ○ 55-gallon composite overpack; BPA Catalog # 824665 Containers greater than 5 gallons may be shipped in their original containers if non-leaking and DOT compliant
Testing Requirements	None (View generic profile)
Labeling Instructions	• Hazardous Waste Label ○ BPA catalog #: 793050 • Washington State Toxic Label ○ BPA catalog #: 1025151 • Class 3 Diamond Label ○ BPA catalog #: 793054 • IWS 313 Silver Label ○ BPA catalog #: 1020564
Storage Precautions	May react with strong oxidizing materials. Keep away from open heat, sparks or flame.

Shipping Instructions	• Go to BES Shipping Module • Click on NEW WASTE • Select appropriate waste stream from drop down menu • Fill in applicable information • Click SAVE • Click SEND REQUEST • Click PRINT



1



2



3



EPA WASTE NO.
D001, D005, D006, D007, D008, D018
DOT PROPER SHIPPING NAME
RQ, Waste, UN 1263, Paint related material, 3, PG11

4



BPA F 5472.64e
(08-10)
(Previous editions unusable)

U.S. DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION

Electronic Form Approved
By Forms Mgmt. 08/25/2010

CHEMICAL WASTE PROFILE

WASTE IDENTIFICATION NUMBERS	
LAB REPORT NUMBER	
HAZMAT ID NUMBER	
IDENTIFIED WASTE STREAM NUMBER	IWS 313

GENERATOR INFORMATION

REQUESTER'S NAME	PHONE NUMBER *(Include Area Code)*	ORG. CODE	SITE OF GENERATION
Generic Profile – BPA Generators			

WASTE INFORMATION ***(Supplied by Generator)***

NAME OF WASTE Waste Paint

ORIGIN OF WASTE Varies

VOLUME AND COMPOSITION OF WASTE Varies

TYPE AND SIZE OF CONTAINER Varies

ANALYTICAL RESULTS ***(Including Methods and Detection Limits Where Appropriate)***

	DESCRIPTION	ANALYSIS RESULTS	TEST METHOD	DETECTION LIMIT
Physical Characteristics	Color	Varies		
	Odor	Paint		
	Physical State	Varies		
	Layers			
	Other			
EPA/WDOE Characteristics	Specific Gravity	Varies		
	Ignitability	Flashpoint ≤ 60°C (212°F)	ASTM D93	
	Corrosivity	Varies	EPA SW-846 9045D	
	Reactivity	N/A		
	TCLP Metals Toxicity	Barium ≥ 100 mg/L	EPA SW-846 1311/6020	
		Cadmium ≥ 1.0 mg/L		
		Chromium ≥ 5.0 mg/L		
		Lead ≥ 5.0 mg/L		
Gross ID	TCLP VOC	Benzene ≥ 0.5 mg/L	EPA SW-846 1311/8260D	
		Methyl ethyl ketone (MEK) ≥ 200 mg/L		
	Total VOC	N/A	EPA SW-846 8260D	
	SVOC	N/A	EPA SW-846 8270E	
WDOE Persistent Chemicals	Halogenated Hydrocarbons	N/A	EPA SW-846 9023	
	Polycyclic Aromatics	N/A	EPA SW-846 8270E	
TSCA	PCB Assay	N/A	ASTM D4059	
Other (specify)				
UHC				

COMMENTS	LAB BPA ID NUMBER	WO	TASK	ABM
Profile based on knowledge of waste				
		QC VERIFICATION: BT		
	PROFILE APPROVED BY *(Signature)*	PROFILE CERTIFICATION DATE: 3/24/2024		

RECORD NUMBER

FILE CODE: EQ-20-11
RETENTION: KEP/Z = A + 50 YRS; OTHERS = S

BPA F 5472.63e
(08-10)
(Previous editions unusable)

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SHIPPING INFORMATION

WASTE IDENTIFICATION NUMBERS	
LAB REPORT NUMBER	
HAZMAT ID NUMBER	
IDENTIFIED WASTE STREAM NUMBER	IWS 313

US DOT DESCRIPTION ***(Box 11 on Manifest)***

DOT SHIPPING NAME

RQ, Waste, UN1263, Waste paint related material, 3, PGII

TECHNICAL NAME/ADDITIONAL WASTE DESCRIPTION	REPORTABLE QUANTITY *(RQ)*
Flammable/hazardous paint	**4.54 kg (10 lbs)**
IS THIS WASTE ACCEPTABLE AT BPA HAZMAT? ☒ YES ☐ NO	

WASTE NUMBER ***(Shaded Box 1 on Manifest)***		**DOT EMERGENCY RESPONSE INFORMATION** ***(Box K)***
EPA WASTE CODES	STATE WASTE CODES	EMERGENCY RESPONSE GUIDEBOOK NUMBER
D001, D005, D006, D007, D008, D018, D035	**WT02**	**128**
LAND DISPOSAL RESTRICTION NOTIFICATION FORM ***(LDR)***		**EMERGENCY CONTACT**
☒ REQUIRED ☐ NOT REQUIRED		**1-800-424-9300**

REQUIRED LABELS AND MARKINGS

☒	YELLOW HAZARDOUS WASTE LABEL	☒		MARKINGS: GREEN CHARACTERS LABEL
☒	DIAMOND HAZARD LABEL		☒	TOXIC
☒	3 *(Flammable)*		☐	PERSISTENT
☐	6 *(Poison)*		☐	REACTIVE *(D003)*
☐	6 *(Harmful - Stow Away from Food Stuffs)*		☐	CORROSIVE *(D002)*
☐	8 *(Corrosive)*		☒	IGNITABLE *(D001)*
☐	9 *(Environmentally Hazardous Substance)*			
☐	Other *(Specify)*			
☐	PCB Markings			
☐	EPA *(Yellow "Caution - Contains PCBs" Label)*	☐		Other *(Specify)*
☐	BPA *(White "PCB Content" Label)*			

WASHINGTON CODES	
SOURCE CODE:	**G11**
FORM CODE:	**W209**
ORIGIN CODE:	**i (Recurrent)**
MM CODE:	**H141**

TYPE OF WASTE	
RCRA HAZARDOUS WASTE	☒
TSCA WASTE (PCB)	☐
WASHINGTON DANGEROUS WASTE	☒
EXTREMELY HAZARDOUS WASTE	☐
OREGON HAZARDOUS WASTE	☐
NON-HAZARDOUS WASTE	☐

ADDITIONAL WASTE SPECIFIC INFORMATION

-

PRECAUTIONS

- **Keep away from strong oxidizing materials**
- **Keep away from sources of ignition and high temperature**

FILE CODE: TT-12-13
RETENTION: See BPA Records Manual

Miscellaneous Waste

BONNEVILLE POWER ADMINISTRATION (BPA)
LAND DISPOSAL RESTRICTION NOTIFICATION

UNIQUE IDENTIFICATION NUMBER: IWS 313

WASTE DESCRIPTION: Flammable/hazardous paint

BPA GENERATOR SENDING WASTE: _____
ADDRESS: _____
EPA ID No.: _____ **CONTACT NAME:** _____
DATE: _____ **PHONE NUMBER:** _____
WASTE SHIPMENT MANIFEST NUMBER: _____

RESTRICTED WASTE INFORMATION

TREATABILITY GROUP: NWW*

EPA HAZARDOUS WASTE NUMBER	WASTE SUBCATEGORY	UNDERLYING HAZARDOUS CONSTITUENTS
D001	High TOC	
D005	TCLP	
D006	TCLP	
D007	TCLP	
D008	TCLP	
D018	TCLP	
D035	TCLP	

* WW = "Wastewater"
NWW = "Non-Wastewater"

POTASSIUM HYDROXIDE (KOH) ELECTROLYTE

Waste Stream Number	IWS-443
Waste Stream Description	Waste potassium hydroxide (KOH) electrolyte from grounding cells and from alkaline batteries.
Regulatory Status	• **HAZARDOUS** • **DOES COUNT** towards facility generator status
Packaging Instructions	Ensure that you package in a container approved for caustics: ○ 55-gallon, composite BPA Catalog #: 824665 ○ 5-gallon, composite container insert BPA Catalog #: 824670
Testing Requirements	None (View current profile)
Labeling Instructions	• Hazardous Waste Label ○ BPA catalog #: 793050 • Washington State Toxic Label ○ BPA catalog #: 1025151 • Class 8 Diamond Label ○ BPA catalog #: 793052 • IWS 443 Silver Label ○ BPA catalog #: 793096
Storage Precautions	Contact with acids, reactive metals, cyanides, oxidizers, chlorinated solvents, etc. may generate toxic and/or flammable gases, or cause fire or explosion.

Shipping Instructions	• Go to BES Shipping Module • Click on NEW WASTE • Select appropriate waste stream from drop down menu • Fill in applicable information • Click SAVE • Click SEND REQUEST • Click PRINT

IWS 443 Waste Potassium Hydroxide (KOH) Electrolyte



1



2



3



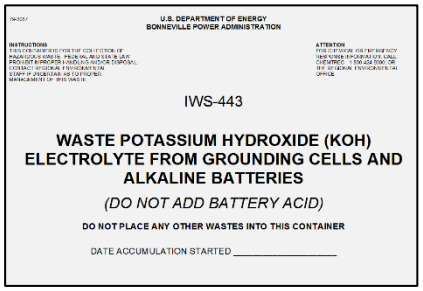
EPA WASTE NO.

D002, D007, WT02

DOT PROPER SHIPPING NAME

Waste, UN 1814, Potassium Hydroxide n.o.s., 8, PGII

4



BPA F 5472.64e
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CHEMICAL WASTE PROFILE

WASTE IDENTIFICATION NUMBERS	
LAB REPORT NUMBER	
HAZMAT ID NUMBER	
IDENTIFIED WASTE STREAM NUMBER	IWS 443

GENERATOR INFORMATION

REQUESTER'S NAME	PHONE NUMBER *(Include Area Code)*	ORG. CODE	SITE OF GENERATION
Generic Profile – BPA Generators			

WASTE INFORMATION ***(Supplied by Generator)***

NAME OF WASTE Waste Potassium Hydroxide (KOH) Electrolyte

ORIGIN OF WASTE Substation Maintenance

VOLUME AND COMPOSITION OF WASTE Varies

TYPE AND SIZE OF CONTAINER Varies

ANALYTICAL RESULTS ***(Including Methods and Detection Limits Where Appropriate)***

	DESCRIPTION	ANALYSIS RESULTS	TEST METHOD	DETECTION LIMIT
Physical Characteristics	Color	Clear, Colorless		
	Odor	None		
	Physical State	Liquid		
	Layers			
	Other			
EPA/WDOE Characteristics	Specific Gravity	>1		
	Ignitability	Flashpoint > 100°C (212°F)	ASTM D93	
	Corrosivity	pH ≥ 12.5	EPA SW-846 9040C	
	Reactivity	N/A		
	TCLP Metals	Chromium ≥ 5.0 mg/L	EPA SW-846 1311/6020	
	Toxicity			
Gross ID	TCLP VOC	N/A	EPA SW-846 1311/8260D	
	Total VOC	N/A	EPA SW-846 8260D	
	SVOC	N/A	EPA SW-846 8270E	
WDOE Persistent Chemicals	Halogenated Hydrocarbons	N/A	EPA SW-846 9023	
	Polycyclic Aromatics	N/A	EPA SW-846 8270E	
TSCA	PCB Assay	N/A	ASTM D4059	
Other (specify)				
UHC				

COMMENTS	LAB BPA ID NUMBER	WO	TASK	ABM
Profiled in BPA Chemistry Lab Report No. TEST-15-1006				
		QC VERIFICATION: BT		
	PROFILE APPROVED BY *(Signature)*	PROFILE CERTIFICATION DATE: 3/24/2024		

RECORD NUMBER

FILE CODE: EQ-20-11
RETENTION: KEP/Z = A + 50 YRS; OTHERS = S

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SHIPPING INFORMATION

WASTE IDENTIFICATION NUMBERS	
LAB REPORT NUMBER	
HAZMAT ID NUMBER	
IDENTIFIED WASTE STREAM NUMBER	IWS 443

US DOT DESCRIPTION ***(Box 11 on Manifest)***

DOT SHIPPING NAME

Waste, UN1814, Potassium hydroxide, n.o.s., 8, PGII

TECHNICAL NAME/ADDITIONAL WASTE DESCRIPTION	REPORTABLE QUANTITY *(RQ)*
Potassium hydroxide solution, caustic	**45.4 kg (100 lbs)**
IS THIS WASTE ACCEPTABLE AT BPA HAZMAT? ☒ YES ☐ NO	

WASTE NUMBER ***(Shaded Box 1 on Manifest)***		**DOT EMERGENCY RESPONSE INFORMATION** ***(Box K)***
EPA WASTE CODES	STATE WASTE CODES	EMERGENCY RESPONSE GUIDEBOOK NUMBER
D002, D007	**WT02**	**154**
LAND DISPOSAL RESTRICTION NOTIFICATION FORM ***(LDR)***		**EMERGENCY CONTACT**
☒ REQUIRED ☐ NOT REQUIRED		**1-800-424-9300**

REQUIRED LABELS AND MARKINGS

☒	YELLOW HAZARDOUS WASTE LABEL	☒		MARKINGS: GREEN CHARACTERS LABEL
☒	DIAMOND HAZARD LABEL		☒	TOXIC
	☐ 3 *(Flammable)*		☐	PERSISTENT
	☐ 6 *(Poison)*		☐	REACTIVE *(D003)*
	☐ 6 *(Harmful - Stow Away from Food Stuffs)*		☒	CORROSIVE *(D002)*
	☒ 8 *(Corrosive)*		☐	IGNITABLE *(D001)*
	☐ 9 *(Environmentally Hazardous Substance)*			
	☐ Other *(Specify)*			
☐	PCB Markings			
	☐ EPA *(Yellow "Caution - Contains PCBs" Label)*	☐	Other *(Specify)*	
	☐ BPA *(White "PCB Content" Label)*			

WASHINGTON CODES		**TYPE OF WASTE**	
SOURCE CODE:	**G19 (Potassium hydroxide, caustic)**	RCRA HAZARDOUS WASTE	☒
FORM CODE:	**W110**	TSCA WASTE (PCB)	☐
ORIGIN CODE:	**i (Recurrent)**	WASHINGTON DANGEROUS WASTE	☒
MM CODE:	**H141**	EXTREMELY HAZARDOUS WASTE	☐
		OREGON HAZARDOUS WASTE	☐
		NON-HAZARDOUS WASTE	☐

ADDITIONAL WASTE SPECIFIC INFORMATION

- **Store in a plastic lined composite package appropriate for caustics**

PRECAUTIONS

- **Keep away from strong oxidizing materials**
- **Keep away from sources of ignition and high temperature**

FILE CODE: TT-12-13
RETENTION: See BPA Records Manual

Miscellaneous Waste

BONNEVILLE POWER ADMINISTRATION (BPA)
LAND DISPOSAL RESTRICTION NOTIFICATION

UNIQUE IDENTIFICATION NUMBER: IWS 443

WASTE DESCRIPTION: Potassium hydroxide solution, caustic

BPA GENERATOR SENDING WASTE: _____
ADDRESS: _____
EPA ID No.: _____ **CONTACT NAME:** _____
DATE: _____ **PHONE NUMBER:** _____
WASTE SHIPMENT MANIFEST NUMBER: _____

RESTRICTED WASTE INFORMATION

TREATABILITY GROUP: NWW*

EPA HAZARDOUS WASTE NUMBER	WASTE SUBCATEGORY
D002	Corrosive
D007	TCLP

UNDERLYING HAZARDOUS CONSTITUENTS

* WW = "Wastewater"
NWW = "Non-Wastewater"

Machine Coolants

Waste Stream Number	IWS-912
Waste Stream Description	Machine coolants contaminated with metals contamination. (Water miscible cutting and grinding fluids) **This waste stream is specific to the Ross Construction Shops**
Regulatory Status	**HAZARDOUS** **COUNTS** towards monthly facility generator status
Packaging Instructions	Package in appropriately sized closed-top (bung head) drum: ○ 5-gallon, bung head BPA Catalog # 824675 ○ 30-gallon, bung head BPA Catalog # 824653 ○ 55-gallon, bung head BPA Catalog # 824655 Provide space in containers for expansion during shipping.
Testing Requirements	None (View generic profile)
Labeling Instructions	• Washington State Dangerous Waste Label ○ BPA catalog #: 1025152 [VIEW LABELS]
Storage Precautions	Keep away from acids and strong oxidizing materials.
Shipping Instructions	Transfer from Ross Construction shops to HazMat along with completed Ross Waste Delivery Form



1

WASHINGTON STATE

DANGEROUS WASTE

STATE LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE, OR
PUBLIC SAFETY AUTHORITY, AND THE
WASHINGTON STATE DEPARTMENT OF ECOLOGY

SHIPPING NAME MATERIAL NOT REGULATED BY DOT (WASHINGTON STATE DANGEROUS WASTE ONLY,)

GENERATOR INFORMATION:

NAME _____

ADDRESS _____

CITY _____ STATE ____ ZIP _____

MANIFEST
DOCUMENT NO. _____

BPA F 5472.64e
(08-10)
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CHEMICAL WASTE PROFILE

WASTE IDENTIFICATION NUMBERS	
LAB REPORT NUMBER	
HAZMAT ID NUMBER	
IDENTIFIED WASTE STREAM NUMBER	IWS 912

GENERATOR INFORMATION

REQUESTER'S NAME	PHONE NUMBER *(Include Area Code)*	ORG. CODE	SITE OF GENERATION
Generic Profile – BPA Generators			

WASTE INFORMATION ***(Supplied by Generator)***

NAME OF WASTE Water Miscible Cutting and Grinding Fluid (Machine Coolant)

ORIGIN OF WASTE Maintenance

VOLUME AND COMPOSITION OF WASTE Varies

TYPE AND SIZE OF CONTAINER Varies

ANALYTICAL RESULTS ***(Including Methods and Detection Limits Where Appropriate)***

	DESCRIPTION	ANALYSIS RESULTS	TEST METHOD	DETECTION LIMIT
Physical Characteristics	Color	Light Tan/Grey/Green		
	Odor	Mild		
	Physical State	Liquid		
	Layers			
	Other			
EPA/WDOE Characteristics	Specific Gravity	0.98-1.03		
	Ignitability	Flashpoint >100°C (212°F)	ASTM D93	
	Corrosivity	pH=6.0-9.0	EPA SW-846 9040C	
	Reactivity	N/A		
	TCLP Metals Toxicity	Below Regulatory Limits	EPA SW-846 1311/6020	
Gross ID	TCLP VOC	N/A	EPA SW-846 1311/8260D	
	Total VOC	N/A	EPA SW-846 8260D	
	SVOC	N/A	EPA SW-846 8270E	
WDOE Persistent Chemicals	Halogenated Hydrocarbons	Total Halogens > 10,000 ppm	EPA SW-846 9023	
	Polycyclic Aromatics	N/A	EPA SW-846 8270E	
TSCA	PCB Assay	N/A	ASTM D4059	
Other (specify)				
UHC				

COMMENTS	LAB BPA ID NUMBER	WO	TASK	ABM
		QC VERIFICATION: BT		
	PROFILE APPROVED BY *(Signature)*	PROFILE CERTIFICATION DATE: 3/24/2024		

RECORD NUMBER

FILE CODE: EQ-20-11
RETENTION: KEP/Z = A + 50 YRS; OTHERS = S

BPA F 5472.63e
(08-10)
(Previous editions unusable)

U.S. DEPARTMENT OF ENERGY
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SHIPPING INFORMATION

WASTE IDENTIFICATION NUMBERS	
LAB REPORT NUMBER	
HAZMAT ID NUMBER	
IDENTIFIED WASTE STREAM NUMBER	IWS 912

US DOT DESCRIPTION ***(Box 11 on Manifest)***

DOT SHIPPING NAME

Material Not Regulated by D.O.T. (Washington State Dangerous Waste, Persistent)

TECHNICAL NAME/ADDITIONAL WASTE DESCRIPTION	REPORTABLE QUANTITY *(RQ)*
Used machine coolant, persistent	
IS THIS WASTE ACCEPTABLE AT BPA HAZMAT? ☒ YES ☐ NO	

WASTE NUMBER ***(Shaded Box 1 on Manifest)***		**DOT EMERGENCY RESPONSE INFORMATION** ***(Box K)***
EPA WASTE CODES	STATE WASTE CODES	EMERGENCY RESPONSE GUIDEBOOK NUMBER
None	**WP01**	**154**
LAND DISPOSAL RESTRICTION NOTIFICATION FORM ***(LDR)***		**EMERGENCY CONTACT**
☐ REQUIRED ☒ NOT REQUIRED		**1-800-424-9300**

REQUIRED LABELS AND MARKINGS

☐ YELLOW HAZARDOUS WASTE LABEL		☒ MARKINGS: GREEN CHARACTERS LABEL	
☐ DIAMOND HAZARD LABEL		☐	TOXIC
☐	3 *(Flammable)*	☒	PERSISTENT
☐	6 *(Poison)*	☐	REACTIVE *(D003)*
☐	6 *(Harmful - Stow Away from Food Stuffs)*	☐	CORROSIVE *(D002)*
☐	8 *(Corrosive)*	☐	IGNITABLE *(D001)*
☐	9 *(Environmentally Hazardous Substance)*		
☐	Other *(Specify)*		
☐ PCB Markings			
☐	EPA *(Yellow "Caution - Contains PCBs" Label)*	☐	Other *(Specify)*
☐	BPA *(White "PCB Content" Label)*		

WASHINGTON CODES	
SOURCE CODE:	**G16**
FORM CODE:	**W205**
ORIGIN CODE:	**i (Recurrent)**
MM CODE:	**H141**

TYPE OF WASTE	
RCRA HAZARDOUS WASTE	☐
TSCA WASTE (PCB)	☐
WASHINGTON DANGEROUS WASTE	☐
EXTREMELY HAZARDOUS WASTE	☒
OREGON HAZARDOUS WASTE	☐
NON-HAZARDOUS WASTE	☐

ADDITIONAL WASTE SPECIFIC INFORMATION

-

PRECAUTIONS

- **Keep away from strong oxidizing materials**
- **Keep away from sources of ignition and high temperature**

FILE CODE: TT-12-13

RETENTION: See BPA Records Manual

Attachment C-2
Waste Sampling Procedures

Attachment C-2
Waste Sampling Procedures

Note: These procedures are used by BPA generator locations and HazMat personnel to plan for and collect waste samples. BPA reserves the right to update, revise, or modify these procedures to be consistent with standard practices approved by EPA and Ecology. At the minimum, the information contained on the sample forms and tables contained in *Attachment C-3* will be retained on subsequent updates to this plan. References to BPA standard stock and form numbers are for informational purposes only.

Purpose

Waste sampling and analysis provides characterization information required for waste profiling and subsequent handling and disposal. Proper waste sampling techniques are important to ensure that all waste generated at BPA facilities are correctly identified. Practicing the correct sampling procedures also ensures the safety of BPA's employees. In general, waste sampling is required whenever there is a lack of information about a specific waste, and it is suspected of being regulated or hazardous.

Precautions

- Always use extreme caution when opening any waste container. Never open a bulging or damaged waste container - call your environmental office for assistance.
- All unknown waste should be assumed to be dangerous and treated as such.
- If it is necessary to handle a container of unknown waste, consider the waste ignitable, corrosive, or reactive and handle it accordingly.
- If you accidentally come into contact with the waste, immediately remove all contaminated clothing and wash yourself with soap and water.
- Never sample unknown waste alone.
- Avoid producing sparks when removing a bung from a barrel (use a sparkless bung wrench) or a lid from a waste container. Never use a torch or saw to open a waste container. Bung wrenches can be ordered through the BPA Tools Catalog, Stock Number 005753.
- Always promptly replace the lid of the containers being sampled to prevent exposure of the waste to the environment.
- Avoid breathing fumes and avoid bodily contact with the waste. Sampling should be done in a well ventilated area while wearing appropriate protective apparel chosen from the following list:

Protective Apparel	***BPA Stock No.***
Gloves, Sol-Vex, green, 18", size 9	34506
Gloves, Sol-Vex, green, 18", size 10	*34507*
Goggles, safety, clear plastic	*3150*

Shield, full-face, with clear plastic visor	*4407*
Tyvex Coveralls	*20624(L)*
	35704 (M)
	21036 (XL)

Respirators are issued by Safety Office following Fit Test

Note: Place contaminated disposable protective material into a solids waste stream container (such as contaminated rags) which corresponds to the type of material that has caused the contamination. (Use the same information on the Proper Shipping Information Form, received from the Chemistry Laboratory, to prepare and transport the contaminated solids.)

When to Sample a Waste

Waste samples are to be taken when any one of the following conditions exists:

- When a **new waste** is generated due to the use of a new chemical product or maintenance procedure.
- When an **unknown waste** is discovered.
- When an IWS is suspected of **contamination** by a non-waste stream material.
- When a facility receives a waste that does not match the waste description on the accompanying hazardous waste manifest.
- When required by the verification process (See Section C.8.0)
- Any time a waste is suspected to be something other than its current identification.
- When procedures or chemical substances being used are changed, thus altering an IWS.

Note: Whenever a process or procedural change is made that will result in a significant chemical or physical change in the makeup of an IWS, contact the environmental office or the Chemistry Laboratory. The changes will be evaluated to determine the need to re-analyze the waste stream and revise the IWS Kit for that waste.

Quality Assurance for Sampling

Since the analysis of a sample can only be as good as the sample itself, extreme care must be taken to obtain a sample that accurately represents the material in question. The following procedures help ensure data quality:

- Use disposable sampling tools and equipment. It is not recommended that you use reusable equipment for sampling. This would require you to clean the equipment with a solvent between each sample at which point you would need to consult with the chemistry laboratory to ensure the correct solvent is used and you would also need to collect, sample and manage the spent solvent as an additional waste.

- Use a Sample Custody Record **(Chain of Custody)** when collecting and transporting samples to the Chemistry Laboratory. A Sample Custody Record, BPA F5450.06, must be accurately completed and used to transfer custodial possession of the samples from the collector and subsequent handlers until the samples are received by the laboratory performing the analysis. The sampler must indicate on this form the type of analysis requested. The Chain of Custody will be included in the final laboratory report. Refer to *Figure C-3-2* for an example Chain of Custody and directions for completing it.
- Use properly cleaned and suitable sample containers. Refer to *Figure C-3-3* for appropriate sample containers, preservation methods, and holding times.
- Follow the sampling guidelines outlined in the following sections.

Sampling Liquid Waste

Much of the waste generated within BPA by Maintenance and Construction activities are liquids accumulated in 208 liter (55-gallon) drums and 19 liter (5-gallon) pails. The best sampling technique available to obtain a sample that represents the entire contents of a drum-type container is the Composite Liquid Waste Sampler (COLIWASA**)**.

Using the COLIWASA

The COLIWASA is designed to take a continuous plug sample that captures all layers of a waste all the way from the top to the bottom of a drum. Use a disposable type COLIWASA and dispose of it into the waste drum when sampling is completed. The COLIWASA consists of a narrow, generally 4-foot-long glass, plastic, or metal tube equipped with an end closure or rod which can be inserted as a stopper. The rod fits through the center of the tube and allows the tube to be opened and closed while the COLIWASA is vertically submerged in the waste to be sampled. To use the COLIWASA follow the instructions below.

1. Release the closure at the bottom of the tube by moving the handle at the top perpendicular to the tube. Check to see that the COLIWASA is open.
2. Slowly lower the open COLIWASA into the waste container until you feel the bottom with the closure rod.
3. While the rod is resting on the bottom, carefully close the sampler or insert and seat the closure rod.
4. With a rag wrapped around the COLIWASA, remove the sampler while wiping down the outside of the tube.
5. Estimate the volume of the container based on the contents of the sampler.
6. Slowly release the sample into an appropriately sized and specialty cleaned sampling jar. Contact the BPA Chemistry laboratory for sample jar size and type appropriate to the analysis to be requested. (Note: If sample will be analyzed for volatile organics, either transfer portion of sample directly into 40 ml VOA vial, or carefully release COLIWASA into quart container minimizing agitation. Then, with

a smaller sampling device (pipette , small diameter liquid thief sampler, or by carefully pouring) transfer liquid into sample vial.)

7. Repeat the above steps as long as the complete COLIWASA sample can be added to the jar. It is more important to obtain the complete representative sample (contained in the COLIWASA) than to completely fill the jar.

8. Dispose of COLIWASA into the waste drum when sampling is completed.

9. Promptly replace the lid of the containers to prevent exposure of the waste to the environment and volatilization of constituents.

Sampling Solid Waste

Contaminated Rags

A significant amount of the solid waste generated within BPA consists of material such as contaminated rags. When there is a need to sample a solid waste such as **contaminated rags**: take a 1-liter (1-quart) sample of the material that contaminated the rag, when possible. If not, send a representative sample of the contaminated rags for analysis. In addition to submitting the sample, you will need to indicate exactly what the rags were used for.

Soils & Debris

Always consult with your environmental office prior to initiating any soil and debris sampling effort. In many instances, sampling that was previously conducted to determine the extent of a clean-up effort will suffice and the drummed soil will not need additional sampling prior to disposal. PCB and TPH concentrations may also be assumed based upon the content of the material that has spilled. However, whenever you are required to sample a container of soil or debris, the following protocol should be followed.

Your sampling strategy will vary according to the number of containers of a specific waste and your access to those containers. Ideally, waste in every container will be sampled. If this is not feasible due to the **large number** of containers of the same waste, **10 percent or more of the containers should be randomly selected for sampling**.

Access to a container may also affect the number of samples that can be taken or the location within the container from which samples can be taken. Ideally, several samples should be taken from locations through out the waste. **When access to a container is not limited**:

1. Use a three-dimensional sampling strategy in which the container is divided by constructing an imaginary grid.

2. Take one core sample from each quarter slice of the container.

3. Divide this core sample into representative vertical cuts (i.e., surface, middle, bottom) using a stainless steel trowel or spoon.

4. Collect a grab sample of the waste using an appropriate sampling device:

- Sludges – Trier
- Moist powders or granules – Trier
- Dry powders or granules - Thief
- Sand or packed powders and granules – Hand auger
- Large grained solids – Large trier

Note: Use an appropriate decontamination fluid to clean sampling equipment between samples.

Sampling for TCLP Analysis

The Toxicity Characteristic Leaching Procedure (TCLP) analysis is done to determine whether a solid waste (i.e., soil) exhibits a toxicity characteristic(s). If a solid waste does exhibit toxicity characteristics, it is a hazardous waste. Samples for TCLP analysis should be collected as follows:

1. Use **two** 1-liter (1-quart), specialty cleaned, glass jars with Teflon-lined lids. **Note: Teflon lids or lid liners must be used.**
2. Fill one sample jar up to the top with soil. This sample will be used for volatile and non-volatile analysis.
3. Fill the second jar to about 2 inches from the top with soil. This sample will be used to determine the physical characteristics of the waste.

Note: Use an appropriate decontamination fluid to clean sampling equipment between samples.

PREPARING SAMPLES FOR SHIPMENT

Remember to always follow the procedures below when shipping waste samples to the BPA Chemistry Laboratory or any other Laboratory for analysis:

- Complete and attach a Laboratory Sample (for Waste Analysis) Label (BPA Form F5410.03) to each sample that will be submitted to the laboratory for analysis. Instructions for proper completion of this label are detailed in *Figure C-3-1.*
- Test results will be returned to you on the Chemical Waste Profile / Proper Shipping Information Form.
- Complete a Chain of Custody and submit with your sample(s). *Samples submitted for hazardous waste determination/designation must always be accompanied by a properly signed Chain of Custody.*
- Seal the sample container tightly *to avoid l*eakage. Duct or Strapping tape should be used to tape the lid closed for additional security.
- Place each sample bottle in a separate plastic bag which will contain the contents in the event of breakage and prevent cross-contamination with other samples. Wrap each *glass container in bubble wrap for protection against breakage.*

- *A picnic cooler is typically used as a shipping container. In p*reparation for shipment, tape the drain plug shut from both the inside and outside of the cooler. Mark the shipping cooler with "up" arrows denoting which end should remain up. Line the cooler with a large plastic bag. Place approximately 2.5 cm (1-inch) of packing material (such as vermiculite or Styrofoam beads) in the bottom of the liner.

- Place the sample containers in the lined cooler. Some samples may need to be kept cool 4° C (34 F) to minimize the loss of volatile contaminants while being shipped to the Chemistry Laboratory. Do not ship samples to the laboratory on wet ice. If samples are required to be kept cool during shipment, pack self-contained frozen blue ice packs around the sample containers. (Note: See Figure C-3-3 for guidance on sample preservation and holding times).

- Fill the remainder of the lined cooler with packing material. Use sufficient packing material to prevent sample containers from making contact during shipment.

- Place all paperwork going to the laboratory (chain-of-custody) inside a plastic bag, seal the bag, and tape it to the inside of the cooler lid. Tape the cooler lid shut with strapping tape.

- Samples that must be received by the laboratory within 24 to 48 hours for analysis must be shipped by overnight carrier, typically Federal Express. A standard airbill is required for shipment which will be supplied by the carrier. Send samples without a short turn-around time to the laboratory via Transportation Request (TR) . Note: *Samples* sent to the Chemistry Laboratory do not require a hazardous waste manifest.

- Keep a record of samples that you have collected. At a minimum, these records should include the date of sampling, sample identification numbers, your name, the location of the waste material, and the date the sample(s) was forwarded for analysis.

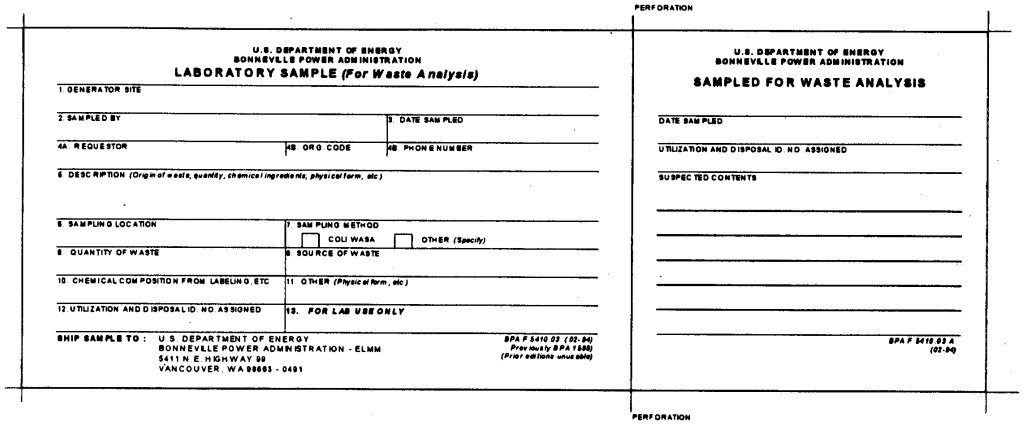
Attachment C-3

Forms Used for Requesting Waste Analysis and Sample Container/Preservation Requirements

The forms included in this appendix are for example only. The information contained on the forms will be included on any version of the forms used for the same purposes, although the forms themselves may change in appearance.

Attachment C-3
Forms Used for Requesting Waste Analysis and Sample Container/Preservative Requirements

USE OF THE *WASTE ANALYSIS* LABORATORY SAMPLE LABEL



❶ For unknown waste samples, obtain a Utilization and Disposal Identification Number ("H" number) from your Area Environmental Office or from the Utilization and Disposal Unit, SRMF.

❷ Complete Part A, Sections 1-12, of the Label as follows and attach Part A to the sample container:

Section 1 - Facility or other location at which the waste was generated or found.
Section 2 - Print the name of the person(s) who collected the sample.
Section 3 - Record the date the sample was collected.
Section 4 - Name, routing and phone number of person requesting analysis. (Analytical results will be returned to this person).
Section 5 - Description of the waste sampled including: physical description (color, smell, texture etc.)and any container markings;
Section 6 - Location from which the sample was collected.
Section 7 - Sampling method. If other than Coliwasa, specify the method used (i.e. scoop, shovel etc.).
Section 8 - Quantity of waste (# drums, gallons, pounds etc.).
Section 9 - Source of waste (process or procedure by which the waste was generated, if known).
Section 10 -Known or suspected chemical composition of the waste from knowledge, product label, markings, etc.
Section 11 -Additional information or comments.
Section 12 -Utilization and Disposal Identification ("H") number.

❸ Complete Part B, including date sampled, Utilization and Disposal Identification ("H") number, and suspected or known contents of the waste, and attach Part B to the waste container (in most cases this will be the drum that the waste will be transported in).

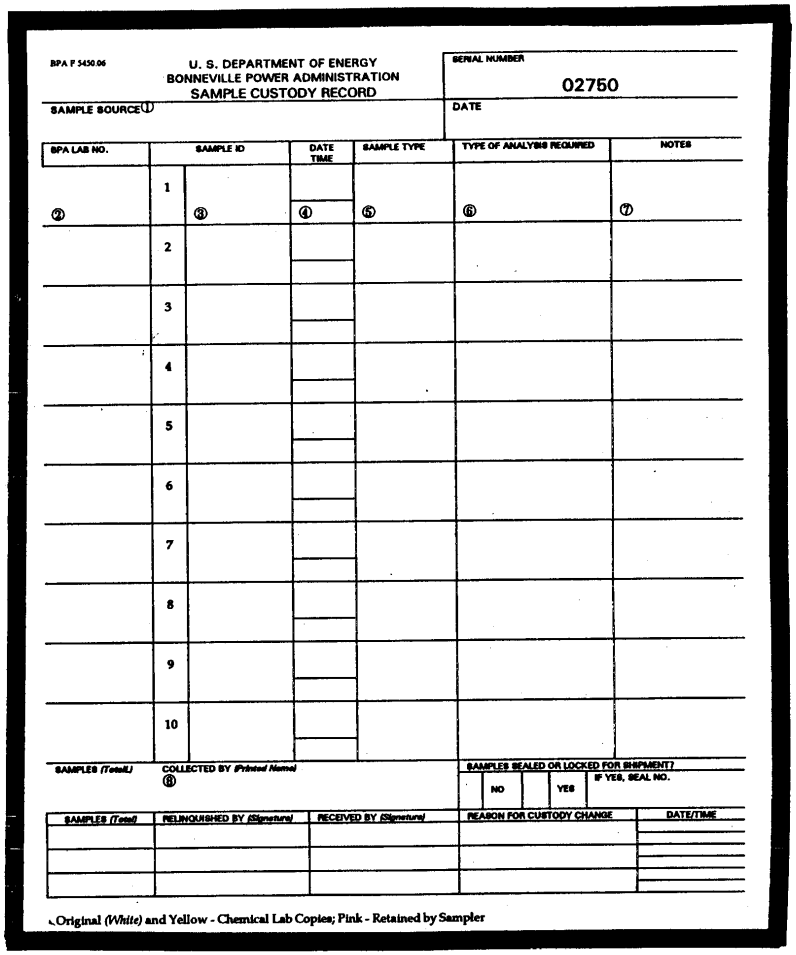
Figure C-3-1
Sample Form Used to Request Laboratory Analysis

SAMPLE CUSTODY RECORD (BPA FORM 5450.06)

This form documents sample custody transfer from the sampler, sometimes through another person, to the analyst. When transferring samples, each of the individuals relinquishing and receiving the samples should sign and date the form and note the reason for the custody change as well as the time custody was relinquished. (Note: The completed Sample Custody Record can be sealed into the shipping container, eliminating the requirement for couriers or other intermediary handlers to sign the Custody Record. Receipt of the shipping container intact signifies the shipment has not been tampered with).

1. Sample source - Facility at which sample(s) was collected
2. BPA Lab No. - Assigned by the Chemistry Laboratory
3. Sample ID - Field assigned sample identifier (e.g. Alpha-numeric or sample location)
4. Date/Time - Date and time sample was collected
5. Sample Type - Media sampled (e.g. soil, water, oil etc..)
6. Analysis Required - List of analytical tests requested
7. Notes - Indicate if a sample has been split and with whom. Also note method of shipment, courier name and other pertinent information.
8. Custody information - Indicate who collected the samples, and document transfer of custody from the sampler to receipt by the laboratory.

Sampler - Retain the pink copy for your records and send the white and yellow copies with the samples.



BPA F 5450.06

U. S. DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
SAMPLE CUSTODY RECORD

SERIAL NUMBER 02750

SAMPLE SOURCE①

DATE

BPA LAB NO.		SAMPLE ID	DATE TIME	SAMPLE TYPE	TYPE OF ANALYSIS REQUIRED	NOTES
②	1	③	④	⑤	⑥	⑦
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					

SAMPLES (Total) ⑧ COLLECTED BY (Printed Name)

SAMPLES SEALED OR LOCKED FOR SHIPMENT? NO YES IF YES, SEAL NO.

SAMPLES (Total)	RELINQUISHED BY (Signature)	RECEIVED BY (Signature)	REASON FOR CUSTODY CHANGE	DATE/TIME

Original (White) and Yellow - Chemical Lab Copies; Pink - Retained by Sampler

Figure C-3-2
Sample Custody Record Form

Matrix/Parameters To Be Analyzed	Sample Container Type and Materials	Preservation Method	Maximum Holding Time
SOLIDS:			
Volatile organics (total)	Widemouth glass w/teflon liner	Cool to 4° C	14 days
Semivolatile organics (total)	Widemouth glass w/teflon liner	Cool to 4° C	14 days for extraction 40 days for analysis
Pesticides, herbicides, and insecticides (total EPA scan)	Widemouth glass w/teflon liner	Cool to 4° C	14 days for extraction 40 days for analysis
Polychlorinated biphenyls (PCBs)	Widemouth glass w/teflon liner	Cool to 4° C	14 days for extraction 40 days for analysis
Dioxins and furans	Widemouth glass w/teflon liner	Cool to 4° C	14 days for extraction 40 days for analysis
Mercury (total)	Widemouth glass w/teflon liner	Cool to 4° C	28 days for extraction 28 days for analysis
Chromium (VI)	Widemouth glass w/teflon liner	Cool to 4° C	24 hours
All other metals (total)	Widemouth glass w/teflon liner	None	6 months for extraction 6 months for analysis
pH	Widemouth glass w/teflon liner	None	Analyze immediately
Total organic halogens (TOX)	Widemouth glass w/teflon liner	Cool to 4° C	7 days
Total organic carbon (TOC)	Widemouth glass w/teflon liner	Cool to 4° C	28 days
Toxic volatile organics, per TC rule	Widemouth glass w/teflon liner	Cool to 4° C	14 days for TCLP 14 days for analysis
Toxic semivolatile organics, per the TC rule	Widemouth glass w/teflon liner	Cool to 4° C	14 days for TCLP 7 days for extraction 40 days for analysis
TC pesticides and herbicides	Widemouth glass w/teflon liner	Cool to 4° C	14 days for TCLP 7 days for extraction 40 days for analysis
Concentrated Waste Samples w/teflon liner	Widemouth glass	None	14 days
Metals (TCLP) w/teflon liner 6 months for analysis	Widemouth Glass	Cool to 4° C	6 months for TCLP
Mercury (TCLP) w/teflon liner 28 days for analysis	Widemouth Glass	Cool to 4° C	28 days for TCLP

[a] Highly concentrated samples generally do not require preservation. When chemical preservation is required, care must be taken to ensure that incompatible preservations are not added. For example, an aqueous sample that is to be analyzed for metals should not have acid added to it if the sample also contains cyanides.

Figure C-3-3[1]
Sample Containers, Preservation, and Holding Times for Solids[2]

[1] Source: *Waste Analysis at Facilities That Generate, Treat, Store, and Dispose of Hazardous Waste*, EPA-OSWER 9938.4-03, April 1994.

[2] All Matrix/Parameters are analyzed using COLIWASA/SW-846 methodologies.

Matrix/Parameters To Be Analyzed	Sample Container Type and Materials	Preservation Method	Maxiumum Holding Time
LIQUIDS:			
Metals (TCLP))	Widemouth glass	Cool to 4° C	6 months for TCLP 6 months for analysis
Mercury (TCLP)	Widemouth glass	Cool to 4° C	28 days for TCLP 28 days for analysis
Volatile organics	40 mL VOA Vial	Cool to 4° C; pH<2 HCl; Na2S2O3	14 days
Semivolatile organics	1 Liter Amber glass	Cool to 4° C Na2S2O3	7 days for extraction 40 days for analysis
Pesticides, herbicides, and insecticides	1 Liter Amber glass	Cool to 4° C pH: 5-9	7 days for extraction 40 days for analysis
Polychlorinated biphenyls (PCBs)	1 Liter Amber glass	Cool to 4° C	7 days for extraction 40 days for analysis
Dioxins and furans	1 Liter Amber glass	Cool to 4° C Na2S2O3	7 days for extraction 40 days for analysis
Metals (total)	1 Liter polyethylene	Cool to 4° C pH<2 HNO3	6 months for analysis
Mercury (total)	1 Liter polyethylene or Widemouth glass	Cool to 4° C pH<2 HNO3	13 days (plastic) 38 days (glass)
Chromium (VI)	500 mL Amber glass	Cool to 4° C	24 Hours
pH	Glass or polyethylene	None	Analyze immediately
Total organic halogens (TOX)	1 Liter Amber glass	Cool to 4° C pH<2 H2SO4	7 days
Total organic carbon (TOX)	1 Liter Amber glass	Cool to 4° C; pH<2 HCl or H2SO4	28 days
Concentrated Waste Samples	Widemouth Glass w/teflon lines	None	14 days

[a] Highly concentrated samples generally do not require preservation. When chemical preservation is required, care must be taken to ensure that incompatible preservations are not added. For example, an aqueous sample that is to be analyzed for metals should not have acid added to it if the sample also contains cyanides.

Figure C-3-3
Sample Containers, Preservation, and Holding Times for Liquids

Attachment C-4

BPA Chemistry Laboratory Quality Assurance/ Quality Control Plans

Attachment C-4

BPA Chemistry Laboratory Quality Assurance/Quality Control Plans

Bonneville Power Administration

August 2024

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Quality Assurance/Quality Control Plans

The following is a quality assurance/quality control (QA/QC) manual governing the analysis of environmental samples at the chemistry laboratory.

It consists of the following 16 points:

1. Title page
2. Table of contents
3. Project description
4. Project organization and responsibility
5. QA objectives for measured data in terms of precision, accuracy, completeness, representativeness and comparability
6. Sampling procedures
7. Sample custody
8. Calibration procedures and frequency
9. Analytical procedures
10. Data reduction,, validation and reporting
11. Internal quality control checks and frequency
12. Performance and systems audits and frequency
13. Preventative maintenance procedures and schedules
14. Specific routine procedures to be used to assess data precision, accuracy and completeness of specific measurement parameters involved
15. Corrective action
16. Quality assurance reports to management

Project Description

The purpose of this QA manual is to document the quality controls being employed under a Standard Operating Procedure (SOP) for each analysis in progress so that the resultant data produced is of acceptable quality. The SOP defines each step in the handling of a sample once it is received in the lab for analysis.

The objectives of the QA/QC program will be to direct laboratory procedures along guidelines to generate legally defensible data when analyzing samples for wastes under the Resource Conservation and Recovery Act (RCRA).

The end use of laboratory data generated by analysis of samples following the SOP and QC requirements that are stipulated in the QA program will be of high quality acceptable to agencies regulating its disposal.

Oversight of the Corporate QA program comes under Bonneville Power Administration (BPA) management's control with the chemistry lab organizing and being responsible for appropriate QC steps that are to be taken in the area of analysis of environmental samples and other wastes related to RCRA.

Project Organization and Responsibility

The QA Program, its organization, and its resultant QC requirements that are dictated through each analysis' SOP comes under the responsibility of the following staff positions:

- Chemistry Laboratory Team Lead and Laboratory QA/QC Officer
- Chemist(s)

QA Objectives For Measurement Of Data With Respect To Precision, Accuracy, Completeness, Representativeness, and Comparability

Quality control is governed by the SOP for each analysis under the guidelines stipulated in this QA program manual. The defined QC steps to be taken are listed and defined as follows:

Precision

The definition of this term pertains to the total analytical system's ability to give repeatable results, irrespective of the result's accuracy.

A sample taken twice in the field and stored in separate containers to be submitted for analysis is a Sample-Sample Duplicate. If it has positive analyte hits, comparing the two results will give a measure of sampling and analytical SOP precision.

The simplest laboratory procedure to measure precision is the preparation of a sample for analysis that is known to give a positive result and then to simultaneously prepare it twice

(Sample, Sample-Replicate). The recommended frequency for preparing a Sample-Replicate is one in twenty (5 percent). Sample-Replicates should have a Relative Percent Deviation (RPD) of 20 percent.

Preparation of a Matrix Spike-Matrix Spike Replicate (MS-MSR) on a sample and subsequent analysis of the MS-MSR not only gives an indication of a system's precision but also of any matrix affects induced by the sample itself. The recommended frequency for preparing an MS-MSR is also 1 in 20 (5 percent).

The results from analyzing an US-MSR are reported on a test sheet as a percent recovery, and then a relative percent deviation between MS and MSR is also calculated. Control limits within which the sheet is acceptable are sample/matrix dependent, and are derived from statistical evaluations of a data base accumulated over time. The data base gathers points at the beginning of QC implementation and is continuously updated. Control limits are derived mathematically through statistics periodically by the QA/QC officer.

Accuracy

Accuracy is a measure of the analytical system's ability to quantitate the sample and have it approach the true value.

To measure the instrument's stability during an analysis, the standard mixture should be reanalyzed after the tenth sample and compared against the initial calibration mix. The "run" must terminate if it is found that the re-analysis standard deviates more than ±20 percent on the quantitation channel and ±20 percent for the confirmation channel, as shown on the appropriately generated test report sheet. Keeping an instrument within specifications is one step necessary to ensure that the analysis system as a whole produces accurate results.

One measure of a total system's accuracy that does not take into consideration the possible added matrix affect from the sample, is the preparation of a Blank Spike.

The recommended frequency for preparing a Blank Spike is one in twenty (5 percent) and the results of this exercise are recorded. Another method of gauging accuracy of an analytical system is the preparation and analysis of a Standard Reference Material (SRM) that has a known value which is certified as being true within a certain percentage. SRMs should be evaluated every three months.

Completeness

Completeness is a percentage of the actual valid data acquired from a system compared to the amount that was expected. A completeness of 90 percent is usually acceptable.

Representativeness

Representativeness is the degree to which data represents the process which is being measured.

Comparability

Comparability is a measure of similarity between sets of data that have measured the same parameters.

Contract Lab

The QC stipulations being governed by an analysis' SOP under this QA manual apply to contract labs doing testing for BPA. The utilization of test results from a contract lab by BPA implies that the outside lab has met BPA's QA/QC requirements.

Sampling Procedures

Individual Sampling SOPS

The exact procedure used to take a representative sample is often dictated by the method of analysis, or the BPA's sampling SOP.

QC Associated With Each Sample

Collecting adequate sample that is at least four times that which is necessary for analysis will leave enough of the sample to perform Replicates, and to furnish an MS/MSR. Basically, a normal representative sample contains twice the minimum amount of material needed to perform the analysis, so that providing 4X what is necessary requires taking a double sized sample.

Sample Custody

Chain of Custody

Chain of custody documentation needs to track every sample so that its exact location and integrity are known at all times (see BPA sampling procedure). The Custody procedures outlined in this manual apply if the sample is analyzed in the BPA Chemistry Laboratory or by a BPA contract laboratory.

In the Field

Before a sample reaches the lab for analysis, the following is completed by the sampler, at the sample location.

1. Presampling preparations as governed by the appropriate SOP
2. Procurement and prior evaluation for sampling of a site map
3. Preparations for sample preservation
4. Proper labeling of the sample once it is taken
5. Sample chain of custody documentation that indicates the date and time the sample was taken, what type it is (i.e., soil, water, oil, etc) who collected it, and what analysis needs to be done.
6. Record appropriate data into a field notebook or with accompanying field notes.

In the Laboratory

After a sample reaches the lab but before it is prepared for analysis, additional stipulations are placed on its location;

1. A custodian is assigned to keep track of the sample
2. A check is completed on the information contained on the sample's chain of custody
3. A visual inspection to see if it was tampered with and a note on its general condition
4. The custodian tracks a sample's location by updating its laboratory log
5. Subdivision of the sample for QC purposes is noted in the sample's laboratory log

Criteria for Rejecting Samples

When samples arrive at the laboratory, staff immediately log in the sample and verify the sample integrity using the following procedures:

1. Ensure that the Chain-of-Custody record accompanies the sample is complete.
2. Ensure labels are legible.
3. Verify sample size, container, and preservatives are appropriate for requested analyses.
4. Verify holding times have not been exceeded.

The laboratory accepts the sample, if appropriate, by signing the Chain-of-Custody and returning a copy to the originator. If any of the above criteria for sample integrity are not met, the sample will be rejected.

Calibration Procedures and Frequency

Individual Procedural SOPS

Each analysis on an instrument has its own SOP that is the result of a chemist's educational background and hands on experience while analyzing samples on that system. This SOP is a collection of all the specific details pertaining to operation of the instrument (which usually also contains any particular machine peculiarities).

Standards Documentation

All standards used should be traceable with regard to percent purity, source, how prepared, etc. Since Environmental Protection Agency (EPA) standard solutions from Cincinnati are only accurate to ±l5 percent (due to statistical analysis of results from participating labs that have analyzed the solutions, rather than just simply calculating the true value from gravimetric considerations during a solution's preparation) any other solutions prepared from these EPA stocks are considered acceptable if they are in the ±20 percent range of a solution that previously passed the test. Using purchased stock solutions from private vendors that have narrower tolerances, acceptable standard solutions with a range of ±5 percent to ±10 percent can be achieved. When first received, each standard must be acknowledged by logging it into a hard bound book by name, its source, purity, lot number,

date acquired, and person making the entry. Preparation of a solution from the stock is also recorded in this book by giving all pertinent information and steps carried out during its handling, along with the operator's signature. Stock solutions are "good" for one year when kept in a freezer, and working standards for six months when stored in a refrigerator.

Initial calibration of an instrument involves first establishing a steady clean baseline, followed by introduction of a reagent blank. Injection (pertaining to a Gas Chromatograph (GC)) of a series of standard solutions with analytes of interest present in ever increasing concentrations, starting with one solution that is 5X the instrument detection limit and ending with the last almost saturating the detector, will give analyte peaks with responses that when normalized should possess a standard deviation that is less than 10 percent, as shown on the appropriate test sheet.

If analytes have the tendency to break down inside the injector according to its state of maintenance, a measure of the degradation trend is calculated and recorded on the bottom of the test sheet.

A calibration standard will be injected after every tenth sample and should deviate no more than ±20 percent on the quantitation channel and ±20 percent on the confirmation channel when compared to the initial standard response, as shown the test sheet. This method of checking the calibration is applicable to Gas Chromatography (GC), Fourier Transform Infra-Red (FT-IR), Total Chlorine (TX), High Performance Liquid Chromatography (HPLC) and GC-Mass Spectrometry (GC-MS) through tuning.

A measure of the shift in retention time of the surrogate, expressed as a percentage of the first injection's surrogate retention time, is calculated on the appropriate test sheet. Allowable limits are ±.3 percent for capillary, ±1.5 percent for Mega Bore, and ±2 percent for packed columns.

Analytical Procedures

Method SOPS

This document encompasses the entire analytical procedure with respect to the steps a lab needs to take when receiving a sample and producing a result by analyzing it. Every analysis must have a documented method kept on file, and updated when necessary as new technologies improve analytical SOPS.

Sample SOPS

A sample's SOP lays down the exact steps a sample must be taken through once it is submitted to the lab, up to the point where it is ready to be analyzed on an instrument. Every sample preparation for analysis must have a documented preparation SOP.

Instrument SOPS

These SOPs are written instrument/data acquisition instructions that tell exactly what needs to be done on a system to get acceptable results during the analysis of a sample. Every instrument must have a written manual that describes its operation and it should be located in the lab .

Data Reduction, Validation, Reporting

Calculating Results

Results are normally calculated by comparing the sample's analyte signal directly against that of the standard of known concentration. Referencing against a one point standard is acceptable if the system has in the past been shown to be linear between its detection limit and near saturation of its detector. Calculating off of a multipoint standard system establishes linearity and dynamic range before the sample is analyzed, and is the preferred method.

Validation of Data Integrity

QC procedures being followed by directives in each method, sample, and instrument SOP will set forth stable analytical measurement conditions which support data integrity. if the measurement system is linear, no analyte breakdown is occurring, the instrument is stable, surrogate retention time stability does not vary, sample surrogate recovery is acceptable, blank spikes and MS/MSRs are within limits, any analyte hits are within their windows, the blank is really blank and the sample duplicate agrees well with the original sample; data integrity is enhanced and of quality acceptable to regulatory agencies.

Abnormalities

Outliers are usually re-prepared and analyzed. If the same abnormality occurs the second time it is usually attributed to a matrix effect. A matrix effect is any chemical interference in a sample extract that hinders its ability to be quantitated on an analytical instrument.

Flow of Data

Validation of standard concentrations are prepared on a spread sheet and filed for reference. Sample results are recorded in laboratory reports, with a copy being maintained in the lab file and the others disseminated to appropriate locations.

Analyst/Chemist

People responsible for the appropriate standards validation and sample reporting forms are those who work in the chemistry lab.

Internal QC Checks and Frequency

Batch Samples

Samples should be batched together, from the same source if possible, in groups of no more than twenty, so that the following QC requirements at a frequency of one in twenty can be more easily adhered to.

Sample and Sample Replicate

A Replicate (REP) of a sample should be processed once for every 20 samples taken (5 percent).

Splits

Subsamples should be split to be used for other analysis only if the original sample is well homogenized.

Matrix Spike, Matrix Spike Replicate

Matrix Spikes (MS) and MS Replicates (MSR) are performed on every 20th sample (5 percent).

Field Blank

For hazardous waste characterization/designation, field blanks are rarely necessary as samples are collected directly from the drum or container of waste material. In the event of a hazardous waste spill, it is the responsibility of the Regional Environmental Specialist, using best professional judgement, to ensure that a field blank is collected from an area not affected by the release.

When samples are gathered from the field, several Field Blanks (FB) representative of the sampling matrix are taken away from the area under investigation. This is done to get a reading of the possible background contamination, matrix affect, and a check against cross contamination that might be caused by sampling equipment.

Internal QC Checks and Frequency

General

The QC results are analyzed along with the sample set as specified in this plan. The QC results from quantitative analyses are recorded by the chemist in the laboratory instrument hardbound notebook. These results are later transferred to the laboratory report, checked for transcription errors and against any control limits by the analyst who performs the work. The report is then forwarded to the QC Officer for review along with the instrument printouts for the batch. The QC officer checks the results for validity, transcription errors, and confirms that QC sample results are within control limits. The report is corrected or the analysis is re-run as necessary. The results are signed and dated by the analyst and the person who performed the QC check.

Service and repair records are maintained for each instrument. Instrument calibration/recalibration, service/repair, performance limits, new reagents, and equipment performance data is recorded in the maintenance logs for each instrument.

Method Blank

A Method Blank (MB) is carried along with every group of samples while they are being prepared to signal preparation problems such as glassware, reagent, or apparatus interference and contamination.

Surrogate Recovery

One or more surrogates are added to the sample during its preparation, which have chemical characteristics similar to that of the analytes of interest. They follow along during

the extraction/preparation procedure and their percent recoveries after being analyzed on an instrument give an indication of the extraction efficiency of the analytes while being worked up.

Linearity

At the beginning of each run, solutions of increasing analyte concentration should be injected and the analyte response checked for linearity. Acceptable linearity is achieved when the normalized area count has a standard deviation of less than 10 percent, or the best straight line of response vs concentration has an R value of at least .999.

Check Standard

A standard mix solution injected on an instrument after every 10th sample must be within ±20 percent of the initial calibration standard on the quantitation channel or ±20 percent on the confirmation channel if the run is to continue.

Retention Time Stability

Stipulations on the retention time shift of surrogates, when compared against retention times derived from initial injections, are ±.3 percent for narrow bore columns, ±1.5 percent for Mega Bores, and ±2 percent for packed columns.

Control Charts of QC Parameters

All the information from the preceding internal QC checks can be charted in graph form to get an immediate view of what QC variables are within prescribed limits.

Performance and System Audits and Frequency

Performance Audit

Audits are to be performed every three months by submission of a "real" sample. This total performance test will gauge the contract lab's accuracy in analyzing the submitted sample as acceptable if the reply is within ±20 percent of the true value.

System Audit

This audit is performed once a measurement system is in place. It systematically goes through all field and lab SOPs and QC procedures to ensure the prescribed QA plan is followed.

Contract Lab Audit

A system audit of the BPA's lab will serve as a guideline for checking a contract lab's own adherence to the QA/QC manual's requirements. A system audit of the contract lab is conducted prior to performing any work for BPA. This will be completed before they are allowed to support BPA's analytical requirements.

Ongoing performance audits will be carried out bi-annually by periodic submission of check samples with known concentrations by BPA to the contract lab.

Preventative Maintenance Procedure and Schedules

Preventative maintenance is performed by the BPA (or contract lab) analysts. Maintenance includes replacing minor parts and routine cleaning.

For the Instrument

Each instrument's SOP will state when maintenance is scheduled and what procedure to use.

Spare Parts

Spare parts are found in drawers usually directly beneath each instrument in quantities sufficient to keep the machine in operation for several months before more supplies need to be ordered. It will be the responsibility of the primary operator to keep the necessary repair parts and expendable supplies on hand.

Specific Routine Procedures Used To Assess Data Precision, Accuracy and Completeness of the Analysis

Mathematics of Equations for all Forms

Equations used to calculate the QC parameters on each report come from elementary statistics or are simple math. They are abbreviated on every sheet which contains the evaluated parameter. Referencing the abbreviation back to a manual will show its constituent parts. The most commonly used equations are:

Where

1 E = summation

n 2! 'T n = number of points on the calibration line

For linearity: E (x -x) x = normalized response of analyte

!i = l i i = event taken in sequence

n-I = average normalized analyte response

Where

E = summation

n = number of points on the calibration line

x = normalized response of analyte

i = event taken in sequence

$\overline{X}$ = average normalized analyte response

$$\text{For linearity:} \quad \left| \frac{\sum_{I=1}^{n} (x - \overline{X})^2}{n-1} \right|^{\frac{1}{2}}$$

Where

BD = response of all breakdown analyzes

$$\text{For breakdown:} \quad [E\ BD]$$

[E BD]+[E AN] AN = response of all parent analytes of breakdown products

For continuing calibration check: $\frac{(R)X100}{RI}$

Where
R = response of analyte in check mix
RI = initial analyte response

For Retention Time Stability: $\frac{(RT)X100}{RT_i}$

Where
RT = Retention time of analyte in sample
RT_i = initial retention time of analyte in first standard

For Surrogate Recovery: $\frac{(S)XIOO}{SS}$

Where
S = surrogate response in sample
SS = surrogate response in standard

For MS/MSR: $\frac{(AR)X100}{R}$

Where
AR = analytical response of analyte
R = response of analyte in standard

The RPD for the MS/MSR is given by: $\frac{(MS-MSR)X100}{MS+MSR/Z}$

Where
RPD = Relative % Deviation

Most Frequent Laboratory Operational Errors

The following are the most frequent errors that occur in the lab which must be dealt with through the redundancy of constantly checking on every analytical step. The five categories and the problems associated with them are;

Sampling: a) non representative sampling and misidentification of samples

Experimental: a) failure to follow the SOP

b) improper standardization or to ensure that the standard solution is still accurate

c) having a highly contaminated blank

Recording: a) mistakes in reading instrument data, retention times, responses, or injection volumes

b) not correctly reading a volumetric and making improper dilutions

c) errors in transposing data.

Data Handling: a) calculation errors and incorrect data reduction.

Interpretation: a) improper interpretation or failure to document critical observations.

Corrective Action

Limits, After Which, Require Action

Limit bounds are statistically derived from values of QC parameters that have been evaluated over time and collected in a data base. Preparing a flow chart entails taking ± twice the standard deviation about the mean of the QC parameters in a data base and then plotting these individual points as a value versus the event. Any outliers (sample results failing the lab's QC tests) that deviate from the mean, *± two standard deviations*, are flagged and then dealt with through the appropriate corrective action procedure. The data base is continuously updated with newly acquired QC values from analytical runs that are in progress. Periodically altering the QC limits to reflect the updated data base may narrow or widen up the limits found on each test sheet.

Corrective Procedures

When QC specifications fall outside the acceptable limits on a test report, corrective actions should be taken promptly. This may include stopping the analysis at the earliest point where results are within the specified limits, investigating the cause of the deviation, and re-evaluating procedures to ensure compliance moving forward. If an analysis has difficulty being initiated because the instrument just can't meet the criteria for producing good data, the instrument might require maintenance. QC problems concerning samples dictate that they be put through the instrument again, and if necessary to be prepared again.

Responsible Person

The person initially responsible for the analysis meeting QC specifications is the one operating the instrument. They are the first to know that specifications are not being met and they are in the best position to do something about it.

Quality Assurance Reports To Management

Of Accuracy, Precision, and Completeness

A copy of all test reports and charts, which contain the QC measurements that reflect the quality of data acquired, should be forwarded to upper management as a verification that quality assurance criteria are being met.

Results of Audits

Results from internal system and performance audits should also be forwarded, since they reflect the lab's current quality state and can be used to remedy problem situations. Audits and their resultant findings are good practice for real audits performed by regulatory agencies.

QA/QC Problems and Solutions

Additional QC requirements brought on by more stringent QA is a management concern that must be passed on down to the lab, since management is the first to be notified about

additional QA actions. Persistent QA/QC problems that are difficult to solve in the lab should be brought to management's attention for discussion.

	Yes:	No:	Not Applicable:	Acceptable	Needs Improvement	Not Acceptable
Sample Handling and Control						
Are samples arriving to the lab with proper documentation?						
Are samples arriving in the correct container suitable for the analysis?						
Are samples being shipped to the lab in a manner that ensures their integrity?						
Are samples assigned their own unique lab ID?						
Are samples stored under lock and key?						
When samples are moved throughout the lab are they being signed for by a technician/analyst/chemist?						
If samples need refrigeration, is the cooler under lock and key?						
Is a temperature log of the cooler maintained and checked every morning?						
Sample Preparation Stage						
Are samples batched in groups of 20?						
Has a Method Blank (MB) been prepared?						
has a Sample-Sample Replicate (S-SR) been prepared?						
Has a Matrix Spike-Matrix Spike Replicate (MS-MSR) been prepared?						
Does each preparation have surrogate added?						
Instrument QC						
Is single column analysis being done on multi-component analytes? (for GC)						
Is dual column analysis being done on single component analytes? (for GC)						
Is a calibration curve being initiated spanning the detector's full range?						
Are analytes being quantitated within the established calibration range?						
If analyte breakdown during analysis is a concern, is it being monitored?						

	Yes:	No:	Not Applicable:	Acceptable	Needs Improvement	Not Acceptable
Are continuing calibration checks being performed at regular intervals? (at least 15%)						
Are retention times stable enough for analytes to be called within their established windows? (for GC)						
Are surrogate recoveries within acceptable limits?						
Are S-SRs acceptable?						
Are MS-MSRs acceptable?						
Are the MBs free of interference?						
Are minimum detection limits being met?						
Are detectable hits within their windows? (for GC)						
Is a copy of the CL's AQ/QC plan available?						
Is a current list of employees and their experience available?						
Is data being generated for BPA being archived for 3 years?						

Quality Assurance/Quality Control Requirements For Contract Laboratories

QC at the Sample Preparation Stage

Samples should be batched together, from the same source if possible, in groups of no more than 20.

Subsamples should be split to be used for other analysis only if the original sample is well homogenized.

A Method Blank is carried along with every group of samples while they are being prepared to signal preparation problems such as glassware, reagent, or apparatus interference and contamination.

The simplest laboratory procedure to measure precision is the preparation of a sample for analysis that is known to give a positive result and then to simultaneously prepare it twice, (Sample, Sample-Replicate). The mandatory frequency for preparing a Sample-Replicate is 1 in 20, (5 percent).

Preparation of a Matrix Spike-Matrix Spike Replicate (MS-MSR) on a sample and subsequent analysis of the MS-MSR not only gives an indication of a system's precision but also

of any matrix affects induced by the sample itself. The mandatory frequency for preparing an MS-MSR is also I in 20,(5 percent).

One or more surrogates must be added to the sample during its preparation, which have chemical characteristics similar to that of the analytes of interest. They follow along during the extraction/preparation procedure and their percent recoveries after being analyzed on an instrument give an indication of the extraction efficiency of the analytes while being worked up.

Instrument QC

Single column Gas Chromatographic (GC) analysis of PCBs is acceptable, since the determination of PCBs is by peak pattern recognition.

Single column determination is also acceptable for GC-Mass Spectrometry analysis.

Dual column GC determination is mandatory for analysis of single peak analytes. One column then serves as the quantitation channel and the other dissimilar phased column is there as a confirmation.

Miscellaneous

BPA Laboratory personnel should be allowed to visit the Laboratory, with proper notification, to discuss QA/QC and Laboratory methods and techniques. Laboratories performing analysis for BPA should submit a copy of their Laboratory QA/QC plan. Data generated by a Contract Laboratory analyzing samples for the BPA must archive the information for three years and have it readily available upon request.

Attachment C-5

BPA Chemistry Laboratory Modifications to Method 8015D

Bonneville Power Administration
Chemistry Laboratory
Modification to EPA SW-846 Method 8015D

As outlined in part 11.7 of 8015D, the Bonneville Power Administration (BPA) is using Method 8015D as a screening procedure for identification and characterization of liquid organic waste materials as follows:

- An aliquot of sample is diluted in a suitable solvent (isooctane, acetone, toluene, etc.) and analyzed. Based on the resulting chromatogram, a dilution of known product is made, and the chromatograms are compared. Selection of the known product is made based on generator knowledge, physical characteristics, and operator experience. Wastes are characterized as being similar to the known product or having the same retention time range as the known product. No quantitation is made because samples are diluted from 100% solutions.

- If the unknown waste is determined to be electrical insulating oil by this method, the flashpoint by EPA SW-846 method 1010B is not performed. If the waste is determined to be a flammable solvent, gasoline, or gasoline range organic, the flashpoint test may also be omitted.

Modifications made to method 8015D by the BPA chemistry lab:

- Current column:

  12m X 0.2 mm ID X 0.33 um film thickness HP-1. This column is appropriate for our intended use per part 6.2 of 8015D. If other columns are used in the future, an assessment of suitability will be made. Instrument parameters may be modified to accommodate different columns.

- Current instrument parameters:
  - Carrier gas (helium) flow rate: **2.0 ml/minute**
  - Makeup gas (helium) flow rate: **30 ml/minute**
  - Injector temperature: **280 C**
  - Detector temperature: **340 C**
  - Temperature program:
    Initial temperature: **50 C, hold 3 minutes**
    Temp ramp 1: **50 C to 90 C at 40 C/min, hold 3 minutes**
    Temp ramp 2: **90 C to 300 C at 20 C/min**
    Final time: **5.5 minutes**