



**STANDARD OPERATING PROCEDURE FOR:
PAINT FILTER LIQUIDS TEST**

TVA-KIF-SOP-50

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for
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1.0 PURPOSE

This standard operating procedure (SOP) provides the general technical requirements and operational guidelines for performing the paint filter liquids test on samples of ash loaded on railcars for transport and disposal from the Kingston Fossil Plant (KIF) Ash Recovery Project.

The paint filter free-liquids test is performed to determine if the waste samples contain free liquids and to evaluate compliance with 40 Code of Federal Regulations (CFR) 264.314 and 265.314 *Special Requirements for Bulk and Containerized Liquids* (EPA, 2005).

2.0 GENERAL CONSIDERATIONS

Potential hazards associated with the planned tasks are thoroughly evaluated prior to conducting field activities. The *Site-Wide Safety and Health Plan* (SWSHP) provides a description of potential hazards and associated safety and control measures. A job safety analysis (JSA) was performed for field laboratory testing operations and is included as Table 1 of this procedure.

This SOP is based on U.S. Environmental Protection Agency (EPA) SW-846 Method 9095B, *Paint Filter Free Liquids Test* (EPA, 2004).

Personnel must wear powder-free nitrile gloves while performing the procedures described in this SOP.

Glassware is handled with care to ensure the safety of personnel and maintain the integrity of the ash samples. Glassware is inspected for cracks, chips, or other imperfections prior to use. Glassware that has been compromised is removed from use.

3.0 PROCEDURE FOR PAINT FILTER LIQUIDS TEST

This section documents the equipment required, general operating procedures, and methods associated with performing the paint filter liquids test on waste samples.

3.1 Equipment

The following equipment is required for performing the paint filter liquids test.

- Conical Paint Filter—mesh 60 +/- 5% (Gershon fine- mesh size or equivalent),
- Glass funnel or fluted glass funnel with a mouth large enough to allow at least 1 inch of the filter mesh to protrude.
- Graduated cylinder (Class A),
- Ring stand with ring to support funnel and filter above graduated cylinder, and
- Precision balance to determine the weight of the sample aliquot prior to testing.

Balance calibration and daily verification are performed in accordance with *Daily Calibration Checks for Balances at the KIF Field Laboratory* SOP (TVA-KIF-SOP-48).

3.2 Preparation, Homogenization, and Collection of Test Sample

The samples to be analyzed are waste ash materials collected from railcars which may contain materials other than ash.

- a. If the waste material includes such things as sorbent pads or pillows, cut the waste material into small pieces. Sample size reduction to less than 1 cm may be accomplished by cutting the materials with shears, scissors, or a knife so as to preserve as much of the original integrity of the material as possible. For brittle materials larger than 1 cm, perform light crushing to reduce oversize particles if it is not practical to cut the material.
- b. Homogenize each sample by stirring, shaking, or mixing the material in the sample container thoroughly.
- c. Select a 100-gram representative sample from the homogenized waste material. If it is not possible to obtain 100 grams of sample (± 5 grams) that is sufficiently representative of the waste, the analyst may use larger size samples in multiples of 100 grams (such as 200, 300, or 400 grams). However, when larger samples are used, the sample is divided into 100-gram portions and each portion tested separately.

If any portion of the material contains free liquids, the entire sample is considered to contain free liquids.

3.3 Paint Filter Liquids Test Procedure

The following steps provide the procedure for performing the paint filter liquids test on the waste ash material. A worksheet for recording the sample weight and test results is provided as Table 2 (*Paint Filter Test Data Worksheet*). The results for this test are reported as “Free Liquids” or “No Free Liquids”.

- a. Assemble the filter assembly. Attach the ring to the ring stand. Place the glass funnel into the ring and place the graduated cylinder below the funnel. Adjust the height of the ring so that the funnel stem is inside the graduated cylinder. Place a conical paint filter into the funnel.
- b. Immediately transfer the 100-gram sample (± 5 grams) from Section 3.2 to a large aluminum weigh pan. Record the sample weight on the worksheet.
- c. Immediately transfer the weighed sample into the paint filter.

- d. Allow the sample to drain for 5 minutes. Any liquids that drain are captured in the graduated cylinder. Record the start and stop time on the worksheet (Table 2).
- e. If any portion of the test material passes through the paint filter and collects in the graduated cylinder in the 5-minute drain period, then the material is deemed to contain free liquids for the purposes of 40 CFR 264.314 and 265.314.
- f. Record the test result on the worksheet as either a “YES” or a “NO” for the presence of free liquids.

3.4 Quality Control Samples

A lab duplicate aliquot is analyzed at a frequency of one per 20 samples or with each batch of samples that contain less than 20 samples.

3.5 Laboratory Documentation

Logbooks are maintained by the sampling personnel and used to record field sampling activities. The field logbooks contain information regarding the sampling events per the requirements discussed in the *Field Documentation* SOP (TVA-KIF-SOP-06). Daily calibration verification of the balances is recorded in laboratory logbooks dedicated to each instrument. Laboratory worksheets (Table 2) document the sample weight and results from the laboratory paint filter tests.

The Field Laboratory Supervisor and/or designee review the field logbook entries and laboratory worksheets on a weekly basis at a minimum (daily review is preferred) for completeness and accuracy and indicate this review by initialing the entries.

3.6 Decontamination and Waste Management

The waste ash material that has been tested is returned to the ash storage area stockpiles and managed in accordance with *Management of Investigation-Derived Waste* SOP (TVA-KIF-SOP-12). The paint filters and disposable personal protection equipment (PPE) is managed as ash-contaminated waste, stored in plastic trash bags, and disposed with other KIF Ash Recovery Site ash-contaminated waste in accordance with TVA-KIF-SOP-12.

4.0 REFERENCES

- Tennessee Valley Authority (TVA). *Field Documentation* SOP (TVA-KIF-SOP-06), 2009.
- TVA. *Management of Investigation-Derived Waste* SOP (TVA-KIF-SOP-12), 2010.
- TVA. *Site-Wide Safety and Health Plan for the TVA Kingston Fossil Plant Ash Release Response* (SWSHP), June 2009.

- TVA. *Daily Calibration Checks for Balances at the KIF Field Laboratory SOP*, (TVA-KIF-SOP-48), 2010.
- U.S. Environmental Protection Agency (EPA). 40 CFR 264.314 and 265.314, *Special Requirements for Bulk and Containerized Liquids*, 2005.
- U.S. EPA. SW-846 Method 9095B, *Paint Filter Liquids Test*, Update IIIB, Revision 2, 2004.

Table 1. Job Safety Analysis

Activity/Task: Laboratory Testing

Work Area: TVA KIF Field Laboratory

Date _____

Steps of Activity/Task	Potential Hazard	Safe Plan	Resources
General lab housekeeping	Crowded space with many supplies and instruments in small area.	Keep area neat and clean with supplies stored on shelves above working area. Keep walkways and floor areas free of equipment and supplies.	Shelves and other side of trailer available for storage.
	Lifting buckets of soils or coolers	Use proper lifting practices and a buddy to lift heavy coolers	
	Supplies stored above workspace.	Use step stool to access supplies stored above work space. Do not stand on chairs or tables to reach items above work space.	Step stool
Performing lab tests (moisture content, TSS, etc.)	Exposure to ash and aqueous samples collected from the ballfield and ash recovery system.	Wear safety glasses at all times in the laboratory. Wear gloves at all times when handling samples or equipment that comes in contact with samples.	Nitrile gloves, safety glasses, and eyewash available in lab.
	Glassware breakage and subsequent cuts and abrasions	Handle glassware carefully. Always discard or remove glassware from service if chipped, cracked or otherwise compromised.	
Using drying oven and moisture analyzers for moisture and TSS analyses.	Very hot inside oven and inside the moisture analyzers (110 degrees C). Pinch points around door of oven and lid for moisture analyzers.	Use gloves suitable for handling hot items when removing or adding samples to the oven and moisture analyzers. Keep hands free of pinch points around oven door and lids of moisture analyzers.	Use Teflon coated gloves or liners available in lab.

Steps of Activity/Task	Potential Hazard	Safe Plan	Resources
pH testing	Buffer solutions used for pH meter calibration.	Always wear proper PPE when using chemicals. Keep solutions stored in labeled bottles with lids secured when not in use.	MSDS
Use of TVA vehicle for sample collection and transport.	Low fluid levels or other malfunctioning equipment.	Complete daily walk around inspection of vehicle.	Document in logbook.

Signatures of Persons Involved in Review of JSA

(Supervisor signature/date)

Work shall stop when conditions change, the job changes, or a deficiency is discovered, and the current JSA will be modified or new JSA created.

Table 2. Paint Filter Test Data Worksheet

Date: _____

Method: SW-846 9095B

Sample ID			
Sample Weight			
Filter Start Time			
Filter End Time			
Free Liquids Present?			

Sample ID			
Sample Weight			
Filter Start Time			
Filter End Time			
Free Liquids Present?			

Sample ID			
Sample Weight			
Filter Start Time			
Filter End Time			
Free Liquids Present?			

Sample ID			
Sample Weight			
Filter Start Time			
Filter End Time			
Free Liquids Present?			

Sample ID			
Sample Weight			
Filter Start Time			
Filter End Time			
Free Liquids Present?			

Sample ID			
Sample Weight			
Filter Start Time			
Filter End Time			
Free Liquids Present?			

Comments: Test performed with Gershon Fine Mesh paint Filter.

Technician: _____

Date: _____

Reviewer: _____

Date: _____

KIF TVA Field Laboratory

End of Procedure