WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

PROCEDURE FOR TESTING "SPENT MATERIAL" RECOVERED DURING PAINT REMOVAL OR CLEANING OF EXISTING STEEL STRUCTURES

1.0 PURPOSE

1.1 To provide a procedure for testing spent material recovered during paint removal or cleaning of existing steel structures for toxicity.

2.0 SCOPE

2.1 This procedure is applicable to all steel structures being cleaned and/or having existing paint removed and contained in accordance with Materials Procedure 688.03.20, and sampled in accordance with Materials Procedure 688.03.21.

3.0 APPLICABLE DOCUMENTS

3.1 The United States Environmental Protection Agency (USEPA) SW 846 PART I Methods For Analyses and Properties; Chapter One: Quality Control.

3.2 40 CFR Chapter 1 (7-1-91 Edition) Appendix II: Method 1311: Toxicity Characteristic Leaching Procedure (TCLP).

3.3 SSPC-Guide X7IX (DIS) : Steel Structures Painting Council (SSPC) Guide for the Disposal of Lead-Contaminated Surface Preparation Debris.

3.4 USEPA SW 846 Method 3010: "Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by Flame Atomic Absorption (AA) Spectroscopy or Inductively Coupled Plasma (ICP) Spectroscopy".

3.5 The USEPA SW 846 PART I Methods For Analyses and Properties; Chapter Three: "Methods for Determination of Metals"; Method 6010: "Inductively Coupled Plasma Atomic Emission Spectroscopy"; Method 7000: "Atomic Absorption Methods"; Method 7420: "Lead (AA, Direct Aspiration)".

4.0 TERMINOLOGY

4.1 Description of terms specific to this standard.

4.1.1 Blank - is an artificial sample designed to monitor any laboratory contaminants in test method procedures.

4.1.2 Sample - a portion of the spent material collected and labelled as being representative of a specific lot.

4.1.3 Spike Sample - a duplicate sample analysis that involves the addition of an amount of known metal to one of the duplicate samples. The metal should be one of the toxic metals that is being tested. Percent recoveries are calculated for each metals detected. The relative percent difference between the samples is calculated and used to estimate analytical precision.

4.1.4 Split Sample - portions of a sample taken from the same LOT and tested independently. They are used to document intralaboratory precision for quality control and quality assurance.

4.1.5 Testing Laboratory - a laboratory that is approved by the West Virginia Division of Highways (WVDOH) in the performance of Toxicity Characteristics Leaching Procedure (TCLP) on spent material from steel structures.

4.1.6 Toxic Metals - are metals that meet or exceed the Federal Regulatory limits and considered as hazardous waste. The metals of concern for TCLP testing are: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver (see SSPC-Guide X7IX DIS).

4.1.7 Toxicity Characteristics Leaching Procedure (TCLP) - is a test method to identify toxic metals and their degree of being a hazard to the environment that may exist in spent material (40 Code of Federal Register Method 1311).

5.0 SAMPLE RECEIVING AND ANALYTICAL QUALITY CONTROL

5.1 The laboratory receiving samples shall be evaluated and approved in accordance with MP 688.03.23.

5.2 The samples shall be inspected to ensure that integrity has been maintained upon receipt. Chain of Custody shall be examined to ensure that the number of samples collected, the time of collection, and project information agrees with the information on the sample tags.

5.3 The samples shall be logged in and laboratory personnel notified that samples are available for analysis.

5.4 The samples shall be properly stored and scheduled for analysis.

5.5 The laboratory manager shall closely monitor the progress of the sample storage time and analysis to ensure that USEPA requirements are met.

5.6 Results shall be reviewed and recorded by laboratory personnel after completion of sample analysis.

5.7 The results shall receive a second review by quality control personnel to ensure that the laboratory did the work required and that quality control criteria have been met.

5.8 Data reporting shall be in the final report and it will include all project information. The analysis part of the reporting shall include:

5.8.1 The raw data for all samples analyzed.

5.8.2 The statistical data on samples, as described in USEPA SW 846 Part I: Chapter One, shall include: the average concentration, the standard deviation, the standard error, and the confidence internal for the field samples.

5.8.3 The sample spike and recovery percentages.

5.8.4 The minimum detection limits.

5.8.5 The test method: Toxicity Characteristics Leaching Procedure (CFR 40 Method 1311).

5.8.6 The method of digestion (USEPA SW 846 Method 3010).

5.8.7 The method of analysis and instrument: (USEPA SW 846 Method 6010 for ICP or Method 7000 and 7420 for FLAA).

5.8.8 The determination whether a LOT of spent material is hazardous or nonhazardous. (40 CFR 261).

5.9 The final report shall be sent by fax or mailed to Materials Control, Soils, and Testing (MSC&T) Division within 5 working days of the sampling date. In case of immediate response a phone call can precede the document.

Materials Control, Soils, and Testing Division
190 Dry Branch Road
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6.0 SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

6.1 Three field samples and one split sample shall randomly be selected from the ten samples.

6.2 The four samples along with a spiked sample and a blank sample shall be prepared and extracted by Environmental Protection Agency (EPA) Method 1311: "Toxicity Characteristics Leaching Procedure" (TCLP).

6.3 TCLP extracts shall be digested and analyzed as soon as possible (as stated in Method 1311: 7.2.14).

6.3.1 Digestion shall be performed using USEPA SW Method 3010 (see reference Document 2.3).

6.3.2 Microwave digestion may be used only if the procedure used meets USEPA requirements in Method 1311.

6.4 The samples shall be analyzed for "Toxicity Levels For Metals" to determine if the LOT of spent material is hazardous or nonhazardous (see 40 CFR 261 and Table 1).

6.4.1 The laboratory shall strictly adhere to the USEPA SW 846 Part I, Chapter Three: "Methods for Determination of Metals". Utilizing either Method 6010: "Inductively Coupled Plasma Atomic Emission Spectroscopy"; or Method 7000: "Atomic Absorption Method of Analysis".

6.4.2 The toxicity levels are hazardous if the concentration is at the regulated level or greater for the following table:

TABLE 1

TOXICITY LEVELS FOR METALS
(40 CFR - AS OF AUGUST, 1993)

ELEMENT	CONCENTRATION, mg/L
Arsenic	5.0
Barium	100.0
Cadmium	1.0
Chromium	5.0
Lead	5.0
Mercury	0.2
Selenium	5.0
Silver	5.0

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GLR:Smjh