



SW-846 Methods Program Update and Path Forward

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Office of Land and Emergency Management (OLEM)
Office of Resource Conservation and Recovery (ORCR)*

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Topics to be Covered

- SW-846 Methods Publication
- Update VI
- Update VII
 - PFAS Methods
 - Ignitability Characteristic Proposed Rule
- Future Projects
- Contact Information

Hazardous Waste Test Methods / SW-846

The Resource Conservation and Recovery Act (RCRA) governs waste management and materials recovery and reuse, including the disposal of both hazardous and non-hazardous solid waste. In support of RCRA, EPA developed test methods for the analysis of various environmental media. These test methods can be found in the EPA publication, [Test Methods for Evaluating Solid Waste: Physical/Chemical Methods](#), also known as SW-846.

Can't Find What You Are Looking For?

- Search the [EPA Archive](#) for older methods
- Read the [SW-846 Frequent Questions](#)
- Search the [SW-846 Database](#) for answers to technical questions
- Learn more about the [Resource Conservation and Recovery Act](#)

What's New with SW-846



- [Update VI to SW-846 - Public Comment Period](#)
Open **NEW**
- [Validated Methods \(including LEAF Methods\)](#)
- [SW-846 Database of Technical Questions & Answers](#)

What is SW-846 and How Is It Organized?



- [SW-846 Basics](#)
- [Which Method\(s\) Should I Use?](#)
- [Chapters and Methods in the SW-846 Publication](#)

Technical Guidance



- [Waste Sampling Guidance](#)
- [Test Method Development Process](#)

Regulations, Rules and Policies



- [Federal Register Notices Related to SW-846](#)
- [The Methods Innovation Rule and Method](#)



SW-846 Methods Publication

- Method Publication Process Approved September 2016
 - Streamlined to take less time from method completion to publication
 - *OMB currently reviewing all methods – adds 3-6 months*
 - Methods posted for public comment on SW-846 website (via EPA Docket)
 - Method users are notified via mailing list (improved communication)
 - *Contact orcrSW846@epa.gov to sign up for mailing list*

Sign up for our Mailing List or Submit Other Questions or Comments

- To receive email updates related to SW-846, sign up for our mailing list below.
- To ask a question, provide feedback, or report a problem, please fill out the form below. Be sure to include your email address if you would like a response.

Name
Please enter a name to address you by.

Email Address
If you would like a response, please add your email address.

Email List Sign-up
Click "Yes" if you want to receive email updates related to SW-846.

Yes
 No

- Will Still Notify the Public via FR for Publication of Methods That Are Required by Regulations (i.e., MDPs)



Update VI

Phased Release for Public Comment

SW-846 Update VI Announcements

EPA is releasing Update VI to the SW-846 compendium of methods in three phases. Since all of the Update VI methods are intended used as guidance, the [streamlined method publication process](#) will be used.

On this Page:

- [Phase I: New Method 1340 - In Vitro Bioaccessibility Assay for Lead in Soils](#)
- [Phase II: Revised Methods 8260D and 8270E - Volatile and Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry \(GC/MS\)](#)
- [Phase III: New Leaching Environmental Assessment Framework \(LEAF\) Methods and "How-To" Guide](#)

Relevant Links

- [Update VI Announcements](#)
 - [Phase I](#)- Completed Nov. 201
 - [Phase II](#)- Completed July 20
 - [Phase III](#)- Completed May 20
- [Update VII Announcements](#)

- Phase I – Method 1340: In Vitro Bioaccessibility Assay for Lead in Soil
- Phase II – Methods 8260D and 8270E: Volatile and Semivolatile Organic Compounds by GC/MS
- Phase III – 4 Inorganic LEAF Methods (1313, 1314, 1315, 1316) and the User Guide



Update VI Phase I

- Method 1340 – In-Vitro Bioaccessibility Assay (IVBA) for Lead in Soil
 - ❑ New Method - Characterization of lead in soil under 50,000 mg/kg in concentration
 - ❑ Public Comment Period: March 31 – May 1, 2017
 - ❑ Finalized November 28, 2017
 - ❑ Posted at: <https://www.epa.gov/hw-sw846/sw-846-test-method-1340-vitro-bioaccessibility-assay-lead-soil>



Update VI Phase II

Methods 8260D and 8270E - Volatile and Semivolatile Organic Compounds by GC/MS

- Key revisions:
 - ❑ *Addition of Superfund sites*
 - ❑ *Updated performance data*
 - ❑ *Optional use of hydrogen as carrier gas*
 - ❑ *Advanced measurement technologies (SIM, CI, GC-MS/MS)*
- Public Comment Period: April 28 – June 28, 2017
- Finalized July 12, 2018
- Method 8260D posted at: <https://www.epa.gov/hw-sw846/sw-846-test-method-8260d-volatile-organic-compounds-gas-chromatographymass-spectrometry>
- Method 8270E posted at: <https://www.epa.gov/hw-sw846/sw-846-test-method-8270e-semivolatile-organic-compounds-gas-chromatographymass-spectrometry>



Update VI Phase III - LEAF Inorganic Leaching Tests

➤ **Equilibrium-based leaching tests**

- Method 1313 – pH dependence & titration curve
- Method 1316 – LS dependence

➤ **Percolation (column) leaching test**

- Method 1314 – upflow column

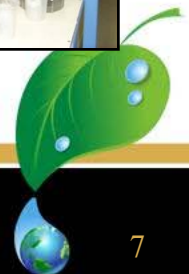
➤ **Mass transport rate-based leaching test**

- Method 1315 – monolith & compacted granular options

➤ **LEAF User Guide**

- Technical guide on using LEAF tests within a leaching assessment

- **Public Comment Period: Nov 2 – Jan 31, 2018**
- **Finalized May 21, 2019**
- **Posted at: <https://www.epa.gov/hw-sw846/leaching-environmental-assessment-framework-leaf-methods-and-guidance>**



Update VII

- **Phase I – Modernizing Ignitable Liquids Determinations Rule**
 - Methods 1010B and 1020C – Flashpoint methods
 - Methods 0010, 0011, 0020, 0023A, and 0051 – Air emissions and stack sampling methods
- **Phase II – Organic**
 - Method 8327 and potentially Method 8328 – PFAS
- **Phase III – Inorganic**
 - Method 3050C – Acid digestion for soils

SW-846 Update VII Announcements

EPA is releasing Update VII to the SW-846 compendium of methods.

On this Page:

- [Phase I - Modernizing Ignitable Liquids Determination](#)
- [Phase II - PFAS Methods 8327 and 3512](#)

Phase I – Modernizing Ignitable Liquids Determination

EPA is proposing changes to the hazardous waste regulations that will modernize how the hazardous waste character determined under the Resource Conservation and Recovery Act. The proposal will also allow the use of non-mercury variety of EPA's analytical methods that currently require mercury thermometers. These proposed amendments, will allow for the use of modern equipment and techniques for making ignitability determinations for waste. In addition, the proposal will reduce the potential mercury exposures to humans and the environment by reducing the overall use of mercury-containing products.

EPA sought input from waste generators, laboratories, state officials, trade associations and members of the public through a 60-day comment period that ended on June 3, 2019. EPA is currently reviewing comments. [View the Proposed Rule in the Federal Register](#). For more information, [check out the Modernizing Ignitable Liquids Determination web page](#).

Rel

[Update VI Anno](#)

[Modernizing Ig
Determination](#)



Update VII – Phase I

The Agency identified a need to revise the RCRA ignitability characteristic for hazardous waste, 40 CFR 261.21

Proposed rule signed March 21, 2019:

- Methods 1010A and 1020B refer to ASTM standards from 1978-1980
 - Outdated, instrumentation no longer commercially available
 - Require Hg thermometers
- Two new methods accepted and published by ASTM in April, 2018:
 - ASTM D8174-18 – Small scale closed cup
 - ASTM D8175-18 – Pensky-Martens closed cup
- Method 1010B: ASTM D93-79, D93-80, or D8175-18
- Method 1010C: ASTM D3278-78 or D8174-18



Update VII – Phase I

- Proposed removal of Hg thermometer requirements in five MDP methods:
 - Methods 0010, 0011, 0020, 0023A, and 0051
- Requested public comment on:
 - Updating references to DOT testing requirements for aerosol cans
 - Aqueous alcohol exclusion at 40 CFR 261.21(a)(1) – defining aqueous as $\geq 50\%$ water
 - Codifying that multi-phase mixtures are hazardous if either phase meets the ignitability characteristic
- Public comment period closed June 3, 2019



Update VII – Phase II

- Method 8327 – PFAS direct injection and external standard LC/MS/MS method for non-potable waters
 - Measures 24 PFAS analytes
 - Uses isotopically labeled compounds as surrogates
 - 6 EPA labs validated in Spring 2018
 - 10 external labs (6 states, 2 commercial, 2 vendors) validated in Fall 2018
 - Data validation completed Spring 2019
 - Method released for public comment on June 21, 2019
- PFAS solid phase extraction and isotope dilution LC/MS/MS method for non-potable waters and solids
 - Measures 25-28 PFAS analytes, including GenX
 - DoD funding method validation through EPA Office of Water's Clean Water Act program
 - Coordinating with OW with goal of eventually adding as Method 8328



Update VII – Phase III

- Method 3050C – Acid Digestion of Sediments, Sludges, and Soils
 - ❑ Strong acid digestion to dissolve almost all elements that could become “environmentally available”
 - ❑ Updates include:
 - *One procedure for ICP-OES and ICP-MS analysis*
 - » HCl added earlier in the procedure
 - *New Appendix B – added to address Incremental Sampling*
 - ❑ Proof of concept – completed Fall 2018
 - *Focus group established to work out kinks*
 - *Method will go back to SW-846 workgroup once the draft is revised*
 - *Multi-lab validation pending method revisions*



Possible Future Projects

- Organic
 - ❑ **Method 5035A** – Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples
 - *Finalize validated method*
 - ❑ **Method 8151A** - Chlorinated Herbicides by GC Using Methylation or Pentafluorobenzoylation Derivatization
 - *Address shortage of Diazald*
 - ❑ **Method 8270E** – Semivolatile Organic Compounds by GC/MS
 - *Add appendix for organochlorine and organophosphorus pesticides by GC/MS/MS*
 - *Combination of Method 8081B and 8141B (participation from Agilent)*
 - ❑ **Method 8330B** – Nitroaromatics and Nitramines by HPLC
 - *Add appendix for insensitive munitions compounds (collaboration with DoD)*
 - ❑ **New Method** – Chlorinated Herbicides by LC/MS/MS
 - *Method 8151A by LC/MS/MS (participation from Agilent with support from other labs)*
 - ❑ **New Method** – Passive Sampling for PAHs and PCBs in Sediment
 - ❑ **New Method** – Diffuse Reflectance Infrared Fourier-transform (DRIFT) Technology for Total Petrochemical Hydrocarbons in Soil (participation from Ziltek)



Possible Future Projects

- Inorganic
 - ❑ **Method 1340** – In-vitro Bioaccessibility Assay for Lead in Soil
 - *Add arsenic (collaboration with OSRTI)*
 - ❑ **New Method 3110** – Extraction of Seafood for Arsenic Species (collaboration with Region 10)
 - ❑ **Method 6200A** – Field Portable X-Ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment
 - *Remove confirmation requirement, replace with optional comparability study*
 - *Add quantitative mode*
 - ❑ **New Method 6870** – Arsenic Speciation Analysis in Seafood Using IC/ICP-MS (collaboration with Region 10)
 - ❑ **Method 3060B** – Alkaline Digestion for Hexavalent Chromium (based on USGS publication)
- Other
 - ❑ **New Method** – Dissolved Methane and Other Light Gases in Aqueous Media (participation from Environmental Standards)



Resources and Contact Information

- Methods Home Page: <https://www.epa.gov/hw-sw846>
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