



# *SW-846 Methods Program Update and Path Forward*

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Office of Resource Conservation and Recovery (ORCR)*

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# Topics to be Covered

- Published Update V
- Preparing Update VI
- Transformed SW-846 Methods Website
- Streamlined SW-846 Methods Publication
- Additional Methods Considerations
- Future Projects and Collaboration
- 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.

### 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](#)
- [Validated Methods \(including LEAF Methods\)](#)

### Technical Guidance



- [Waste Sampling Guidance](#)
- [EPA's Test Method Development Process](#)
- [Quality Assurance for SW-846](#)

### Regulatory and Historical Information



- [Federal Register Notices Related to SW-846](#)
- [The Methods Innovation Rule and Method Defined Parameters \(MDPs\)](#)
- [SW-846 Policy Memoranda](#)

[Contact Us](#) to ask a question, provide feedback, or report a problem.

# Published Update V

## ORCR...

Published August 13, 2015 (40 CFR 8522)

(<https://www.gpo.gov/fdsys/pkg/FR-2015-08-13/pdf/2015-20030.pdf>)

- 8 new and 15 revised methods
- Revised Chapters 1 - 5 of the SW-846 Methods Compendium
- An ORCR policy statement – Memorandum of Clarification Regarding Use of SW-846 Methods

(<https://www.epa.gov/hw-sw846/memorandum-clarification-regarding-use-sw-846-methods>)



# Preparing Update VI

## ORCR...

Preparing Update VI (Three Phases, 5 new and 4 revised methods)

- Phase I - Methods 8260D, 8270E, and 1340
- Phase II - Methods 3050C and 6200A
- Phase III – 4 Inorganic LEAF Methods\* (1313, 1314, 1315, 1316) and the User Guide
- \* The LeachXSLite software is freely available at <http://www.vanderbilt.edu/leaching/leach-xs-lite/>



# Transformed SW-846 Methods Website

New SW-846 web area at <https://www.epa.gov/hw-sw846>

- *Revamped user-friendly navigation across the entire website*
- *Redesigned to make it easier for users to locate information*

## Exciting Features:

- *A [searchable table](#) (by method number, technique, analytes, and CAS#) of all SW-846 methods*
- *A consolidated collection of relevant [Federal Register Notices](#)*
- *Sign up for our [mailing list](#)*
- *The [SW-846 Database](#)*
  - Currently houses over 200 technical questions/answers
  - Search for the information using a keyword search or browse the questions
  - “Replaces” Methods Information Communication Exchange (MICE)



# Streamlined SW-846 Methods Publication

## Processing Non-Regulatory SW-846 Methods

### Then and Now

2005 - 2015	2016 and beyond
Methods Innovation Rule Methods Announced by Notice of Availability (NOA) 2 – 3 year process	No Requirement to Publish Notice 14 – 18 month process
General Action Development Process (ADP)	Notification via the web, mailing list, national conferences
Public Comment Period and Response to Comment	Public Comment Period and Response to Comment
OGC Consultation	OGC Consultation
EPA Program Offices' Review	EPA Program Offices' Review
Briefings, Communication Docs and Signature	Briefings, Communication Docs and Signature
Notice and Docket	On web (and Docket, if necessary)



# Streamlined SW-846 Methods Publication (Cont'd)

- Received Approval for Streamlined Method Publication
  - Previous procedure: 2-3 year process, new procedure: 14-18 month process
    - Methods released to public faster
  - Less workload (more time for other projects & addressing backlog of validated methods)
  - Method users are notified via mailing list (improved communication)
- Will Implement the New Process for the Update VI Phase I Methods (8260D, 8270E and 3050C) – this summer
- Will Still Notify the Public via FR for Publication of Methods That Are Required by Regulations (i.e., MDPs)
  - See <https://www.epa.gov/hw-sw846/final-rule-methods-innovation-rule-mir> for the Methods Innovation Rule and a List of Method Defined Parameters (MDPs)



# Future Projects and Collaboration

- New Method(s) for Perfluorinated Compounds (collaboration with OSRTI, OST, OEM, and Regions 3, 5, 6)
- Methods for Organic Leaching (Collaboration with OSRTI, ORD and academia)
- Method 3060 – Alkaline Digestion for Hexavalent Chromium (collaboration with USGS)
- Method 3110 – Extraction of Seafood for Arsenic Species (Region 10)
- Method 6870 – Arsenic Speciation Analysis in Seafood Using IC/ICP-MS (Region 10)
- Method 8330 – Nitroaromatics and Nitramines by HPLC (collaboration with Region 10)





# Resources and Contact Information

- Methods Home Page: <https://www.epa.gov/hw-sw846>
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- Follow us on Twitter: [@EPAland](https://twitter.com/EPAland)



# Update V

Published – 40 CFR 48522, August 13, 2015  
\* New Methods

1030	Ignitability of Solids
3200*	Mercury Species Fractionation and Quantification by Microwave-assisted Extraction, Selective Solvent Extraction and/or Solid Phase Extraction
3511*	Organic Compounds in Water by Microextraction
3572*	Extraction of Wipe Samples for Chemical Agents
3620C	Florisil Cleanup
4025*	Screening for Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans (PCDD/Fs) by Immunoassay
4430*	Screening For Polychlorinated Dibenzo-p-Dioxins And Furans (PCDD/Fs) By Aryl Hydrocarbon-Receptor PCR Assay
4435*	Method For Toxic Equivalents (TEQS) Determinations For Dioxin-Like Chemical Activity with the CALUX® Bioassay
5021A	Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis
6010D	Inductively Coupled Plasma-Atomic Emission Spectrometry
6020B	Inductively Coupled Plasma-Mass Spectrometry
6800	Elemental and Speciated Isotope Dilution Mass Spectrometry
8000D	Determinative Chromatographic Separations
8021	Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors
8111	Haloethers by Gas Chromatography
8270D	Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry
8276*	Toxaphene and Toxaphene Congeners by Gas Chromatography/Negative Ion Chemical Ionization Mass Spectrometry (GC-NICI/MS)
8410	Gas Chromatography/Fourier Transform Infrared Spectrometry for Semivolatile Organics: Capillary Column
8430	Analysis of Bis(2-Chloroethyl) Ester and Hydrolysis Products by Direct Aqueous Injection
9013A	Cyanide Extraction Procedure for Solids and Oils
9014	Titrimetric and Manual Spectrophotometer Determinative Methods for Cyanide
9015*	Metal Cyanide Complexes by Anion Exchange Chromatography and UV Detection
9320	Radium 228
Chapters	Revised Chapters 1 -5
Policy Statement	SW-846 Policy Statement, definitions and terms



# Update VI Phase I - Organic Methods

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

- Revised to include:
  - ❑ *Analytes frequently found in Superfund sites*
  - ❑ *Performance data for method users to better select sample preparation procedures*
  - ❑ *Optional use of hydrogen as carrier gas to address helium supply shortage*
  - ❑ *Advanced measurement technologies (SIM, CI, GC-MS/MS)*
  - ❑ *Clarified language for LLOQ and method blanks*
  - ❑ *Updated tuning requirements*
- 1<sup>st</sup> Workgroup Drafts were released for comment last March at Pittcon
  - ❑ *114 comments were received and evaluated*
- Efforts made to ensure consistency and possible harmonization among EPA methods
- WG approved methods will be posted online this summer



# Update VI Phase I – Inorganic Method

- Method 1340 – In-Vitro Bioaccessibility Assay (IVBA) for Lead in Soil
  - Characterization of lead bioaccessibility in lead-contaminated soil under field conditions
    - *Not recommended for soils exceeding 50,000 mg/kg total Pb concentration*
      - » Avoid saturation of the extraction fluid
      - » Risk management decisions are not likely to be improved by analyzing soil with concentrations of lead above this level



# Update VI Phase II – Inorganic Methods

- **Method 3050C – Acid Digestion of Sediments, Sludges, and Soils**
  - ❑ Strong acid digestion to dissolve almost all elements that could become “environmentally available”
    - *Elements bound in silicate structures are not dissolved by this procedure (not usually environmentally available)*
    - *Challenges: Poor recovery elements include certain noble or refractory elements such as palladium, silicon, tungsten, and zirconium*
    - *New Appendix B – added to address Incremental Sampling*
- **Method 6200A – Field Portable X-Ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment**
  - ❑ Revising the method for several technical and editorial changes
    - *Removed confirmation requirement, will let method stand on its own QC like other SW-846 methods*
    - *Now optional, and called “comparability”*
    - *Method has two modes of operation*
      - In-situ: screening
      - Ex-situ: quantitative
    - *Replaced performance data with more modern data*



# Update VI Phase III - LEAF Inorganic Leaching Tests\*

## Equilibrium-based leaching tests

- Batch tests on size reduced material
- Measure contaminant release related to pH & liquid/solid (LS) ratio
- **Method 1313** – pH dependence & titration curve
- **Method 1316** – LS dependence



## Mass transport rate-based leaching tests

- Monolithic material or compacted granular material
- Determine contaminant release rates by accounting for physical & chemical properties
- **Method 1315** – monolith & compacted granular options



## Percolation (column) leaching tests

- May be equilibrium or mass transfer rate
- **Method 1314** – upflow column, local equilibrium (LS ratio)



*\*Posted to SW-846 as "Validated Methods" completed August 2013*

