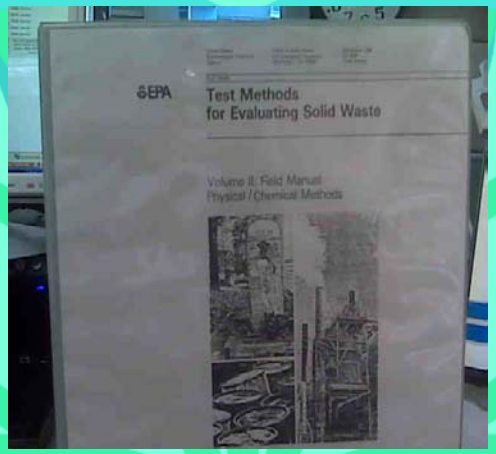
# EPA Clarification of Terms in SW-846




**Kim Kirkland: Team Leader**

**Office of Resource Conservation and Recovery (ORCR)**

# Greetings

United States Environmental Protection Agency

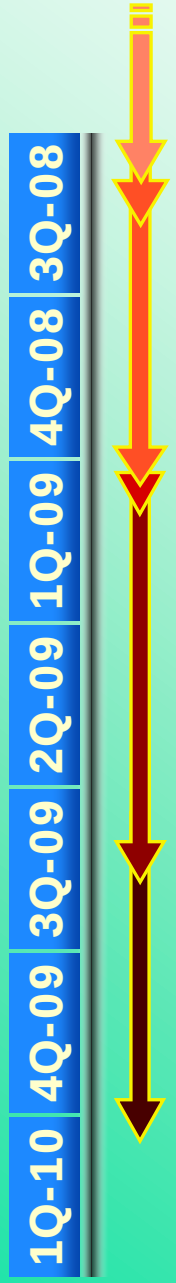
**EPA appreciates the invitation to come to this meeting**

Mark, Charles, Greg, Shen-Yi, Kim, Jim

# Purpose of Presentation

- To provide an update regarding discussions between EPA and ELAB
- Present information regarding:
  - A ***draft new*** **"policy" statement** and
  - **Clarified terms** used in SW-846
- Promote consistency with the use of SW-846 as appropriate
- Help **YOU** to fully understand terminology used in SW-846
- Provide information to better assist you
- Give you the ***411*** on Update V to SW-846

# EPA / ELAB Discussions Timeline on Related Terms




- **July 11, 2008: ELAB Letter to George Gray**
  - Requested "Unique Identifiers" for SW-846 Methods
  - Requested clarification of: deleted, obsolete, previous versions, or revised methods
  - Requested position statement regarding previous versions of methods
  - Requested Implementation Plan for releasing Updates
- **August 2008 – January 2009**
  - Response letters, conference calls and face-to-face meetings between EPA and ELAB
- **January 12 – 13, 2009: Miami Meeting**
  - EPA participated in clarifying issues
- **April 2009: EPA / ELAB Meeting**
- **EPA finalized draft terms**
  - *Following management and OGC approval*

# SW-846 Methods Compendium

United States Environmental Protection Agency

- A analytical methods manual designed for testing and monitoring under the Resource Conservation and Recovery Act (RCRA) Program
- Methods are generally appropriate and reliable for the complexity of RCRA waste matrices
- New methods incorporated through a lengthy validation process:
  - Comprehensive technical evaluation
  - Agency review
- Existing methods are also edited, as needed
  - Following a formal evaluation process by analytical experts (e.g., SW-846 work and focus groups) and an announcement of method availability and request for public comment in the Federal Register as a Notice of Data Availability (NODA)

# Use of SW-846 Methods Compendium

United States Environmental Protection Agency

## USEPA ORCR Policy Statement

- **Divided into 3 Parts:**

  1. **Background**
  2. **General guidance on procedures for adopting methods into SW-846**
  3. **Summary of definitions and terms**

# ❶ Background

- **Methods Innovation Rule (MIR)** [June 14, 2005 (70 FR 34537)]
  - Provides **flexibility** in choice of methods for wastes regulated under RCRA
  - Exception only for ***method-defined parameters*** (MDPs) (see 40 CFR 260.11)
  - **Formal rulemaking no longer required** for publication of updates to SW-846 method
    - Updates are made available through Notice of Data Availability (NODA)
  - **PBMS approach**
  - Method users have the flexibility to employ an SW-846 method or "any appropriate method" from a reliable source
  - When using an alternative method, the focus should be on measurement objectives, rather than on measurement technologies
  - Demonstration of performance is important
  - **Strongly promoted by ORCR**

# ❶ Background cont'd

- **Use of latest SW-846 method version <u>strongly</u> encouraged by ORCR**
  - In new monitoring situations
  - Earlier versions of SW-846 methods may still be used where appropriate or required
    - Existing permits
    - Consent decrees
    - Waste analysis plans
    - Sampling plans

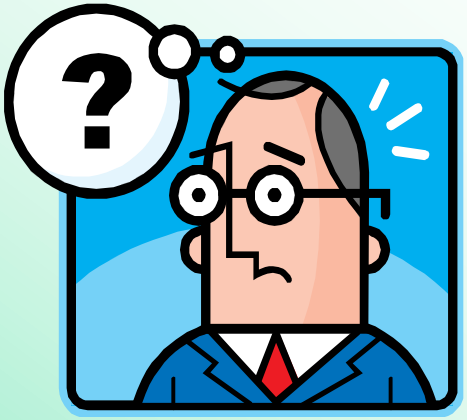
# ❷ Guidance on Adoption of Methods into SW-846

- **Guidance or required??? Both!**
  - **SW-846 is a guidance manual** of appropriate / reliable methods for RCRA-related analytical testing and monitoring
  - Also **contains required methods** for determining MDPs
    - SW-846 method is the *only* one capable of measuring a particular property
    - Required by a specific regulation
- **A new SW-846 method number is assigned when:**
  - New analytical "technology" is introduced
  - Revised quality control requirements induce changes in data comparability with the previous version
- **Addition of Methods to SW-846:**
  - Officially completed through a lengthy process of technical evaluation and Agency review
- **Revisions of SW-846 Methods:**
  - Performed as needed
  - Involves a formal evaluation process by analytical experts (SW-846 work and focus groups)
  - Published announcement of method availability and request for public comment made via a NODA in the FR
- **The Agency posts the most recent version (final method)**
  - On the USEPA web
    - www.epa.gov./epawaste/hazard/testmethods/index.htm

# Question 1

United States Environmental Protection Agency

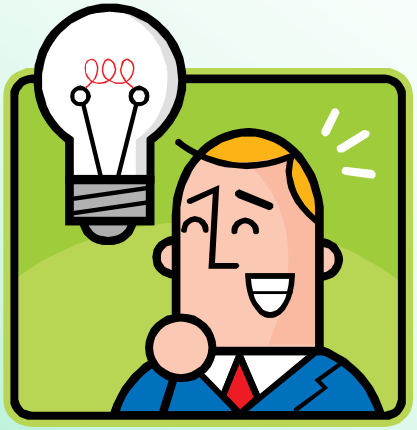
**How will I know what is the latest version of a method in SW-846?**



# Answer

United States Environmental Protection Agency

## How will I know what is the latest version of a method in SW-846?



## The Agency will:

- Continue to update the Methods Status Table
- Provide a summary table of revision to each method
- Provide terms that clarify the status of methods in SW-846

# Methods Status Table

| METHOD NUMBER (Date in parenthesis is found at bottom right-hand corner of method) | | | | | | METHOD TITLE |
|---|---|---|---|---|---|---|
| THIRD EDITION (9/86) | FINAL UPDATE I (7/92) | FINAL UPDATE II (9/94) IIA (8/93) IIB (1/95) | FINAL UPDATE III (12/96) IIIA (4/98) IIIB (11/04) | FINAL UPDATE IV (2/07) | OTHER METHODS (www.epa.gov/ SW-846) | |
| | | | | | (7/05) | Assisted Extraction, Selective Solvent Extraction and/or Solid Phase Extraction |
| 3500 | 3500A | -- | 3500B (Up. III) | 3500C | -- | Organic Extraction and Sample Preparation |
| 3510 | 3510A | 3510B (Up. II) | 3510C (Up. III) | -- | -- | Separatory Funnel Liquid-Liquid Extraction |
| -- | -- | -- | -- | | 3511 (11/02) | Organic Compounds in Water by Microextraction |
| 3520 | 3520A | 3520B (Up. II) | 3520C (Up. III) | -- | -- | Continuous Liquid-Liquid Extraction |
| -- | -- | -- | 3535 (Up. III) | 3535A | -- | Solid-Phase Extraction (SPE) |
| 3540 | 3540A | 3540B (Up. II) | 3540C (Up. III) | -- | -- | Soxhlet Extraction |
| -- | -- | 3541 (Up. II) | -- | -- | -- | Automated Soxhlet Extraction |
| -- | -- | -- | 3542 (Up. III) | -- | 3542A (5/05) | Extraction of Semivolatile Analytes Collected Using Method 0010 (Modified Method 5 Sampling Train) |
| -- | -- | -- | 3545 (Up. III) | 3545A | -- | Pressurized Fluid Extraction (PFE) |
| -- | -- | -- | -- | 3546 | -- | Microwave Extraction |
| 3550 | -- | 3550A (Up. II) | 3550B (Up. III) | 3550C | -- | Ultrasonic Extraction |
| -- | -- | -- | 3560 (Up. III) | -- | -- | Supercritical Fluid Extraction of Total Recoverable Petroleum Hydrocarbons |

# ❸ Summary of Definition and Terms

United States Environmental Protection Agency

- **Terms regarding the use of methods that have been adopted in SW-846:**
  - Final
  - Draft
  - Revised
  - Superseded
  - Withdrawn
  - Minor Modification
  - Major Modification
  - Preliminary Version

# SW-846 Terms

- **Final -**
  - The latest official, *preferred* version of a method included in the SW-846 Compendium and posted on the EPA web site
  - After being published as a Draft method, the method version was announced as a NODA in the FR as part of an update to SW-846
    - For review and comment
- **Draft –**
  - Method that has ***not*** been adopted into the SW-846 method compendium, but has undergone technical review by EPA, i.e.:
    - Technical work group approval and/or
    - Inter-laboratory validation
  - Included on the Agency web site for immediate use by the public
  - *User must demonstrate method capability*

# SW-846 Terms cont'd

- **Revised –**
  - A final method version or other guidance included in SW-846
  - Updated to reflect changes
    - Either editorial in nature *or*
    - Not significant to the technical aspects of the method
    - Do not impact data or performance capability
    - The method number does not change, however the footer suffix and date represent the last change to the method (e.g., 8270, 8270A and 8270B)
    - Revised versions of superseded methods should be viewed as the *preferred* method
- **Superseded –**
  - The previous version of a "Revised" method
    - A method that is no longer included in SW-846 Compendium
    - Has been revised and displaced by a newer version
    - May be available in future on web site *(to be decided)*
    - Not precluded from use when adequate justification for usage exists
    - **"Superseded"** is shown in the method title
      - As listed on the EPA web site for prior versions of final methods followed by the date of supersession

# SW-846 Terms cont'd

- **Withdrawn –**
  - Method or other guidance that EPA *strongly recommends* should ***not*** be used; **Example:**
    - The cyanide and sulfide reactivity procedures removed from SW-846, Chapter Seven as part of the MIR
    - EPA determined that such procedures or methods are technically inadequate and/or no longer meet the use or objectives of the data collection project
    - Withdrawn methods are not technically precluded from being used if:
      - Proper justification and demonstration is provided, and
      - The method is determined to be appropriate for use
    - However, EPA would not expect an adequate justification for using such methods could be developed
- **EPA employs a logical management process**
  - *Assures* that official EPA revisions to a final method are *clearly communicated to the user community*
  - The new numerical designation for the method is determined based on an evaluation
    - Major or minor revision
  - These definitions are used by ORCR and the terms may vary for other program offices

# SW-846 Terms cont'd

- **Minor modification**
  - A change to a final method that is not significant to the technical aspect of the analytical procedure
  - Such a change ***does not***
    - Alter the technology
    - Compromise the analytical intent of the method
    - Reduce the data quality
    - Impact data comparability
  - Such a change ***may***
    - Clarify guidance
    - Add or revise guidance boilerplate
    - Correct a typographical error in method
  - *The numerical designation for methods with minor modifications remains unchanged*
  - Beginning in September 2010:
    - EPA will:
      - Initiate documentation of minor changes to methods in the **"Summary"** section of the **Revised** version
      - Assign a new version date
    - The revision date of methods that undergo minor modification will be documented in the method
    - Significant changes to older methods can be found in the RCRA docket or response to comments document for each update

# SW-846 Terms cont'd

- **Major modification –**
  - Significant change to a final method that includes either:
    - A technology change, that results in an alteration of the method performance or resulting data comparability
      - Example: Alteration of the determinative technique from a colorimetric procedure to an ion chromatography quantitation
    - Substantial modification to the technical aspect of the analytical procedure that may change the scientific outcome of a method
      - Example: The use of an alternate extraction solvent results in the recovery of a greater number of target analytes of interest
    - A major modification will result in the *assignment of a new method number for the modified procedure*

# *Method-specific* Example: Major Modification to 7196A

- When analyzing a wastewater for hexavalent chromium, the analyst employs an ***"ion chromatography"*** technique in place of the **spectrophotometric** quantitation indicated in the method
  - Basis for change: Ion chromatography used to meet designated holding-time requirements
- This alternative quantitation approach would be considered a **major modification to Method 7196A**
- Note: Any data generated using this technique, should not be referenced as Method 7196A

# SW-846 Terms

- **Preliminary Version (PV) –**
  - Denotes a method that has **not** been endorsed by EPA, but is under consideration for inclusion into SW-846
    - **Example -** *Preliminary* version of Method 1313:

      "LIQUID-SOLID PARTITIONINIG AS A FUNCTION OF EXTRACT pH FOR CONSTITUENTS IN SOLID MATERIALS USING A PARALLEL BATCH EXTRACTION"
  - Derived from previously-published procedures (e.g., peer-reviewed papers, academic studies, other agency methods) using reviewed and accepted methodologies
    - **Example** for Method 1313:

      D.S. Kosson, H.A. van der Sloot, F. Sanchez and A.C. Garrabrants, (2002), "An Integrated Framework for Evaluating Leaching in Waste Management and Utilization of Secondary Materials," Environmental Engineering Science, 19(3) 159-204
  - The method has been submitted to the ORCR and is currently under review for development of inter-laboratory validation studies to generate precision and bias data

# Who can / will decide which version of a method to use???

## Everyone!

- The regulator, the laboratory, the region, state etc.
- It is everyone's responsibility to determine which methods will provide data that meets the project-specific needs
- Bottom Line:
  - Keep a written (paper) record of all decisions
  - Have accessible data, QAPPS, SAPS, or whatever supporting document(s) that have been approved for use

# Who has the authority to approve methods???

## There is no one single answer

- It may be project specific
- The state, region, or regulation may dictate which method will be used, or which method allows for flexibility
- Work out the details in the planning stages

# Summary: Important Things to Remember!

- *ORCR strongly advises the use of the latest version of SW-846 methods*, **especially** in **new** monitoring situations
- When choosing a reliable alternative method
- In situations where it may not be appropriate to use the latest method in SW-846, earlier versions may be used. These may include but are not limited to situations where an earlier version of a method is required for
  - Existing permits
  - Consent decrees waste analysis plans or sampling analysis plans
- The focus should be on measurement objectives
- **Not** on measurement technologies
- The user must demonstrate that the method generates data that is appropriate for its intended use
- EPA strongly promotes the PBMS approach because it enables the method flexibility necessary for the analysis of complex RCRA wastes.
- *Demonstration of method applicability and capability is important!*
- EPA recommends:
  - Regulated entities seek approval before applying any method on a specific project, including situations where the method is used verbatim
  - A regulated entity should seek approval of method modifications before use on a specific project


# Update V is on the Fast Track

**By November 2010 , ORCR plans to adopt 20 additional methods as final to the SW-846 compendium:**

**8000C** Determinative Chromatographic Separations

**7199A** Determination of Hexavalent Chromium in Drinking Water, Groundwater and Industrial Wastewater Effluents by Ion Chromatography

**6010D** Inductively Coupled Plasma-Atomic Emission Spectrometry

**6020B** Inductively Coupled Plasma-Atomic Emission Spectrometry

**6850** Perchlorate in Water, Soils and Solid Wastes Using High Performance Liquid Chromatography/Electrospray Ionization/Mass Spectrometry

**6860** Perchlorate in Water, Soils and Solid Wastes Using High Performance Ion Chromatography/Electrospray Ionization/Mass Spectrometry

**8260C** Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

**8330B** Nitroaromatics, Nitramines and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

**9016** Free Cyanide in Water, Soils and Wastes by Microdiffusion

**8015D** Nonhalogenated Organics Using GC/FID

**5020A** Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis

**5030C** Purge-and-Trap for Aqueous Samples

**9013A** Cyanide Extraction Procedure for Solids and Oils

**9014A** Titrimetric and Manual Spectrophotometer Determinative Methods for Cyanide

**9015** Metal Cyanide Complexes by Anion Exchange Chromatography and UV Detection

**3200** Mercury Species Fractionation and Quantification by Microwave-assissted Extraction, Selective Solvent Extraction and/or Solid Phase Extraction

**8323** Determination of Organotins by Micro-Liquid Chromatography-Electrospray Ion Trap Mass Spectrometry

**8271** Assay of Chemical Agents in Solid and Aqueous Samples by Gas Chromatography/Mass Spectrometry, Electron Impact (GC/MS/EI)

**8272** Parent and Alkyl Polycyclic Aromatics in Sediment Pore Water by Solid-Phase Microextraction and Gas Chromatography/Mass Spectrometry in Selected Ion Monitoring Mode

**8276** Toxaphene Congeners by GC/NIMS

# Relevant Contact Information THANKS!!!

- Methods Team Home Page: www.epa.gov/SW-846
- Methods Information Communication Exchange (MICE)
  - Phone: (703) 676-4690
  - E-mail: mice@cpmx.saic.com
- Kim Kirkland
  - Phone: (703) 308-0490
  - E-mail: kirkland.kim@epa.gov

# Method Selection

## Do not do it blindly!