



## Characterization and Remediation Options and Requirements Under TSCA

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### Does TSCA Apply at My Site? (Revisiting this issue)

**40 CFR 761.3 – “PCB remediation waste means waste containing PCBs as a result of a spill, release, or other unauthorized disposal, at the following concentrations:”**

- Materials disposed of prior to April 18, 1978, at concentrations  $\geq 50$  ppm PCBs
- Materials at any concentration where the original source was  $\geq 500$  ppm PCBs beginning on April 18, 1978
- Materials at any concentration where the original source was  $\geq 50$  ppm PCBs beginning on July 2, 1979
- And materials which are currently at any concentration if the PCBs are spilled or released from a source not authorized for use under this part



**Old rule of thumb that TSCA doesn't apply to <50 ppm material is no longer operative.**

## Does TSCA Apply at My Site?

### Burden of Proof

40 CFR 761.50(b)(3)(iii):

“The owner or operator of a site containing PCB remediation waste has the burden of proving the date that the waste was placed in a land disposal facility, spilled, or otherwise released into the environment, and the concentration of the original spill.”

### Information Sources:

- Prior building/site assessments
- Spill records
- Company records of usage/storage of materials
- Earlier correspondence with regulatory agencies
- Existing labels on equipment

## Do Your Research!

- It behooves the property owner to thoroughly evaluate if the PCB-impacted material is a PCB Remediation Waste or not.
- There are considerable cost and time savings if your PCBs are not TSCA-regulated wastes and can be managed by state regulatory programs.
- Ditto for Excluded Product (manufactured product with <50 ppm PCBs).



## FYI – PCB Levels in Foods, People and Environment

- PCBs in human diet are now 1% of what they were in the early 1970s (FDA study).
- EPA data shows a decline in the number of people with >1 ppm in fatty tissue (1972 – 62% of people tested, 1984 – 2%).
- All biota show dramatic declines in PCB concentrations.
- Atmospheric levels also declining, decline is leveling off. Ventilation of indoor air likely major source of atmospheric PCBs.



## PCB-Containing Material That Was Not TSCA-Regulated

### Old Transformer Release

- Assessed release on concrete pad from transformer that contained PCBs, found in inactive industrial facility.
- Based on company dates of activity and transformer use, the transformer label, and the PCB levels in concrete (< 25 ppm), this PCB-impacted material was not TSCA-regulated.
- The spill was remediated as waste oil spill, and transformer was appropriately managed.



## PCB-Containing Material that was not TSCA-Regulated

### Private Industrial Landfill, MA

- Waste material from shoe glue manufacturer was placed in a private landfill. Landfill was closed in 1975, capped and fenced. PCBs in soil ranged from low ppm to 1,000 ppm.
- Per 40 CFR 761.50(b)(3)(i), the soil with  $\geq 50$  ppm PCBs was managed in accordance with TSCA regulations. PCBs  $<50$  were not TSCA-regulated.



## (An aside about subsurface knowledge...)



## What TSCA Regulates

- In-place characterization of PCBs - NOT EX-SITU!!!!
- Sampling, extraction and analytical methods
- Cleanup standards
- Management, treatment or disposal of PCB Remediation Waste
- Post-excavation verification sampling
- Decontamination of PCB-contaminated surfaces and equipment
- Documentation of Remediation



## In-place characterization of PCBs

- Don't dig up your PCB-impacted material and then sample the stockpile. *(EPA assumes you are diluting.)*
- Don't demo your building and then sample the rubble. *(Beware Subpart R)*
- Subpart N – specifies 10 ft grid sampling, does not specify depths. Be thoughtful about grid locations.
- Consider collecting samples at several depths, and analyzing samples in sequential manner, as warranted.
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## In-place characterization of PCBs – Industrial Landfill

- Surveyors established grid (A to U, 1 to 30)
- White pin flags are corners of 10x10 ft grid, used string
- Each 2-ft lift of soil was gridded and sampled for PCBs.
- Red flags = TSCA grids, green flags = non-TSCA grids.

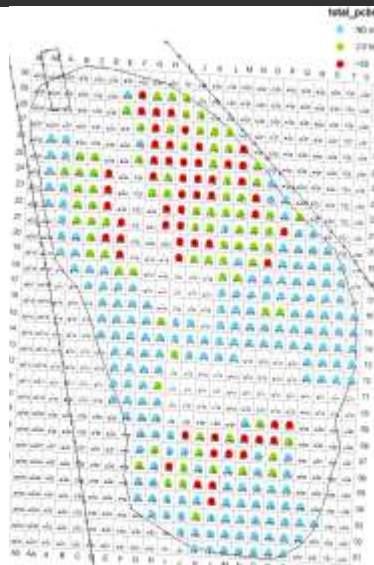


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## In-place Characterization of PCBs – Industrial Landfill

PCB Levels – Lift 1



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## Sampling, Extraction and Analytical Methods

- What Dave Sullivan and Kim Tisa said.
- Must confirm with the lab, write "TSCA" and extraction method on COC.
- EPA Method 3540C – Manual Soxhlet, 48-hr TAT. EPA Method 3550B – Ultrasonic, 24-hr TAT. Subpart Q for alternate method.
- Many labs **still try** to run automated Soxhlet or other extraction.



## Cleanup Standards, Based on Material and Exposure

### 40 CFR 761.61(a) Self-Implementing Standards

Medium	Cleanup Level (a)	Condition	Occupancy Level	Exposure Frequency	Examples of Applicability
Bulk PCB Remediation Waste (b)	≤ 1 ppm	Unrestricted Use	High	≈ 8.7 hours/week	Residence, school, day care center, sleeping quarters, single or multiple occupancy 40 hours/week work station, school classroom, cafeteria in industrial facility, medical room, work station in assembly line
	>1, ≤ 10 ppm	Cap, deed restriction (c)			
	≤ 25 ppm	Unrestricted Use	Low	≈ 8.7 hours/week	Outside a building, electrical equipment vault, non-office space in warehouse
> 25, ≤ 100 ppm	Periodic posted, deed restriction				
Non-porous surfaces (d)	10 ug/100 cm <sup>2</sup>	Unrestricted Use	High	≈ 16.8 hours/week	Shower stalls for high occupancy areas
	100 ug/100 cm <sup>2</sup>	Deed restriction	Low	≈ 16.8 hours/week	Shower stalls for low occupancy areas

Notes:  
 (a) - ppm = parts per million.  
 (b) - Federal Register 63(124):20384-20474 (June 20, 1998), Disposal of Polychlorinated Biphenyls (PCBs), Final Rule.  
 (c) - Cap minimum thickness: 10 inches compacted soil or 6 inches of concrete or asphalt.  
 (d) - Environmental media (soil, gravel, sediments), sewage sludge, buildings and manmade structures (excluding porous surfaces).  
 (e) - Smooth solid surfaces, e.g., uncoated metal, glass, smooth glazed ceramics, polished stone, polycarbonate plastics.

Can use different cleanup standards at different areas of site, with appropriate engineering controls. CT requires four foot cap. CT has additional requirements for low occupancy use. High occupancy is area occupied at ≥355 hours/year.

## Management, Treatment or Disposal of PCB Remediation Waste

- As previously presented, there are three approaches to PCB cleanups:
  - Self-Implementing – 40 CFR 761.61(a)
  - Performance-Based – 40 CFR 761.61(b)
  - Risk-Based – 40 CFR 761.61(c)
- There are no reporting requirements of a historical release (no SEH or RQ), and no deadlines for conducting the remediation.
- It's acceptable to "mix and match" the elements of all three approaches. Example: Use Subpart N for characterization, use Performance-based for removal of Hot Spots, use Risk-Based for alternative verification sampling.



## 40 CFR 761.61(a) Self-Implementing Approach

- For "simple sites," can't be used for cleanup of GW, SW, DW sources, sediments or grazing lands. Those require 761.61(c).
- Conduct in-place characterization sampling before submitting remediation plan. No timeline/ deadline for that stage.
- EPA notification required prior to remediation, 30-day presumptive conditional approval letter. Iterative process!
- Prescriptive guidelines for remediation. Soil disposal limited to TSCA disposal facility, RCRA/HW landfill or soil washing.
- Cleanup standards based on High or Low Occupancy.
- Closure report to EPA within 60 days of completing project.



## 40 CFR 761.61(a) Self-Implementing – Private Landfill

### Elements of remediation:

- Subpart N characterization
- Grids classified as TSCA or non-TSCA
- Excavation and segregation of soil and waste
- Ex-situ treatment of non-TSCA soil for VOC removal
- Off-site disposal of TSCA soil and debris



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## 40 CFR 761.61(b) – Performance-Based Approach



- This approach is useful for localized, small-scale hot spots and older spills. May be used in conjunction with ongoing 761(a) and (c) assessment and remediation.
- Remediation wastes are managed using existing disposal options for other PCB wastes. Ex: TSCA-approved facility, incinerator.
- EPA notification not required. There's no approval documentation from the EPA. Keep your own records!
- "All PCBs must be removed from the site." Can refer to the specific area being remediated.

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## 40 CFR 761.61(c) – Risk-Based Approach

- Covers all other media (GW, SW, DW, sediments, grazing lands).
- Alternative remedial technologies may be approved (onsite disposal under cap, ex-situ thermal desorption, stabilization).
- Alternative sampling schemes to Subparts N and O.
- Risk-based cleanup standards for human and ecological receptors. Eco-risk assessments are reviewed at EPA HQ.
- Requires review and approval of EPA, public notification, risk assessment must include all COCs at the site (not just PCBs). For larger, complicated sites, the submittal and approval timeframe can be years. For smaller sites, the review process may be shorter.
- Greater flexibility, longer timeframe, cost savings, approval uncertainty.
- Region II EPA posts electronic copies of approved remediation plans, including risk-based approvals, on EPA Region II website.

## Post-Excavation Verification Sampling

### Subpart O of 40 CFR 761

- Sampling on 1.5 meter/5 foot grid
- Does not specify vertical sampling frequency
- May request reduced verification sampling with 761.61(c) plan. The better the characterization sampling dataset, the more likely you can do “reduced” verification sampling. Also consider “pre-verification sampling.”
- High number of samples needed at medium to large sites, in the thousands. Often several rounds of characterization sampling, excavation, verification sampling, indicating the need for more excavation.

## Decontamination of Sampling Equipment

Sampling and earth-moving equipment must be decontaminated before leaving the site, per 761.79, Decontamination Standards and Procedures.

- 79(b) – You can do follow any decontamination protocol and then collect wipe samples to confirm.
- 79(c) – Follow the self-implementing decon procedures and you don't have collect wipe samples.

Equipment in contact with liquid PCB wastes needs wipe samples after decontamination.



## Decontamination of Sampling Equipment

- Section 761.79 and Subpart S—Double Wash/Rinse Method for Decontaminating Non-Porous Surfaces (starts at 761.360).
- For “cleanish” surfaces (no dust, dirt, grime or grease), scrub with solvent and wipe up the solvent, wipe surface with moistened pad, then with dry pad. Repeat steps.
- For “dirty” surfaces, scrub with detergent and water, rinse with water and wipe with wet adsorbent pad, scrub with solvent and wipe up the solvent, then wipe with moistened pad and dry pad. Collect and containerize the liquids. Characterize and dispose of properly.
- Regs allow kerosene, diesel, or terpene hydrocarbons for solvent wash. Concerns for sampler's safety and for storage of kerosene and diesel (irritant, fire hazard, etc.) Limonene cleaners fit the bill.

## Decontamination of Sampling Equipment



Trommel screen for physical separation of debris from soil

## Decontamination of Sampling Equipment



Decontamination pad for trucks and excavators (CA)

## Considerations for Remedial Approach Under TSCA



They are the same considerations and trade-offs that one makes for any remediation:

- What is planned future use? Low or high occupancy?
- Will buildings be demolished or left in-place?
- Desired project duration, in a hurry or not?
- Remove all future liability?
- Does client want deed restriction and/or long-term O&M responsibilities?
- Can areas be properly restricted and managed as low occupancy?
- What level of agency interaction/negotiation does client/owner want?
- What are costs for different remedial approaches?

## PCB-Impacted Building Materials

- State and federal regulations addressing PCB-impacted building materials.
- EPA regulatory levels  $\geq 50$  mg/kg PCBs. Expect "discussion" over Excluded Product classification.
- CT Regulations parallel federal regulations except regulatory level is  $>1$  mg/kg.



- **There are no testing requirements of this material by EPA at this time.**
- **Be aware of what sampling results may trigger before you sample any building materials.**



## PCB-Impacted Building Materials and Due Diligence

- Building materials are “open systems” that are unauthorized.
  - Unauthorized uses must be removed.
  - Releases from unauthorized uses also regulated.
- PCBs in Building Materials should be part of due diligence process for buildings constructed or renovated between 1950 and 1980. Approach to PCBs and property transactions can be similar to that for asbestos containing and other hazardous materials. Survey performed in same manner.
- PCB abatement costs approximate to asbestos abatement and are much greater than demolition costs.

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