Alternate PCB Extraction Methods and Amendments to PCB Cleanup and Disposal Regulations

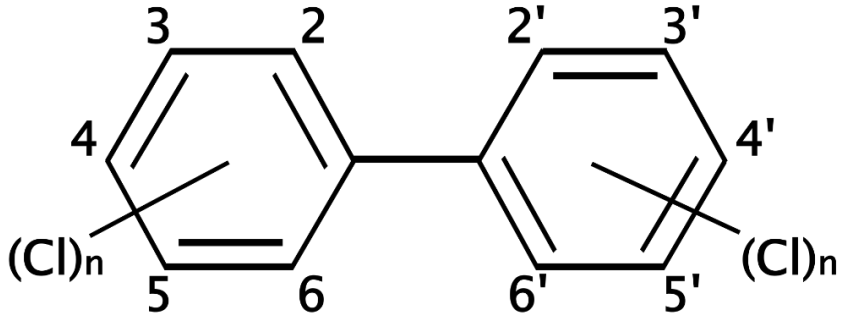
Informational Webinar | November 9th, 2023

Presented by: Jennifer McLeod, USEPA

Background on PCBs and the PCB Regulations

What are Polychlorinated Biphenyls (PCBs)?

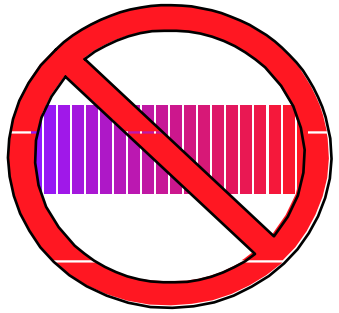
- PCBs are a group of man-made organic chemicals consisting of carbon, hydrogen, and chlorine atoms. The number of chlorine atoms and their location in a PCB molecule determine many of its physical and chemical properties.
- In the United States, PCBs were commercially manufactured from 1929 until production was banned in 1979 by the Toxic Substances Control Act (TSCA).



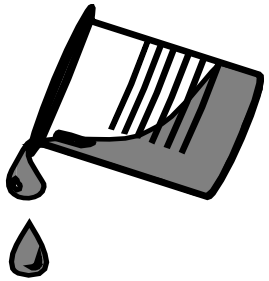
Physical Properties of PCBs

Odorless

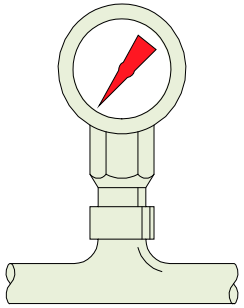
Flame retardant



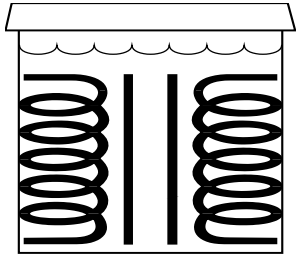
Colorless



Viscous liquid or solid

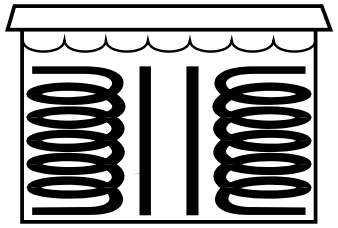


Low vapor pressure

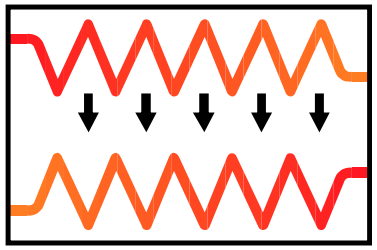


Low electrical conductivity

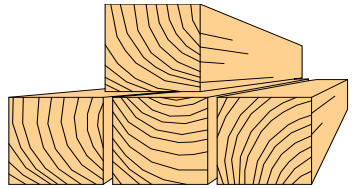
Historical Uses of PCBs



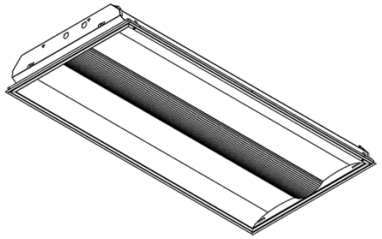
Dielectric fluid



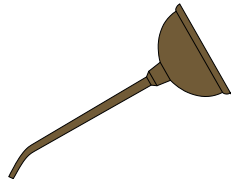
Heat transfer fluid



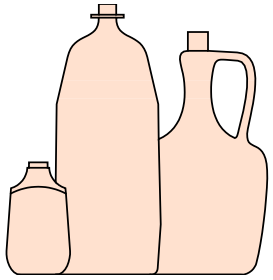
Construction materials (ex. caulk, sealants, tiles, etc.)



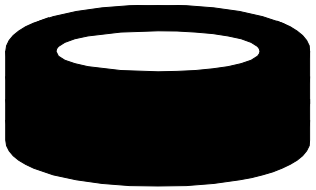
Fluorescent light ballasts



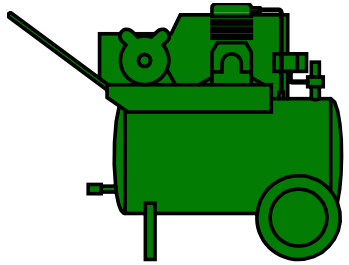
Lubricants



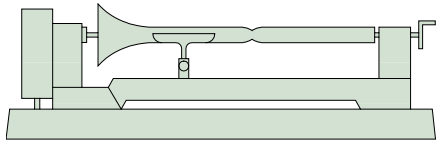
Plasticizer



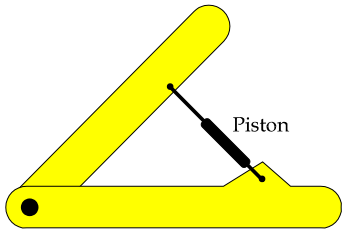
Gaskets & Damping felt



Vacuum pump fluid

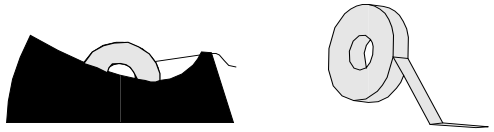


Cutting oils

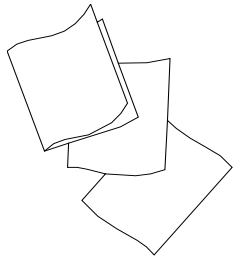


Hydraulic fluid

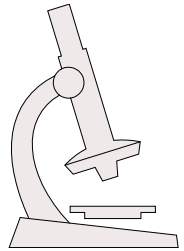
Historical Uses of PCBs -continued



Adhesives

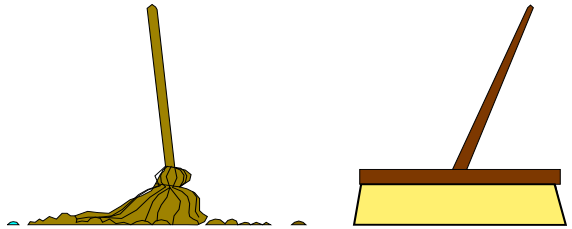


Carbonless copy paper

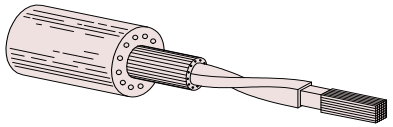


Microscopy

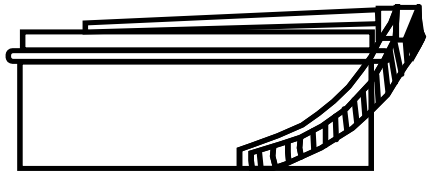
(mounting media & immersion oil)



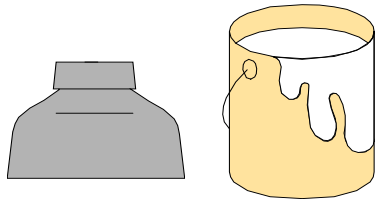
De-dusting Agents



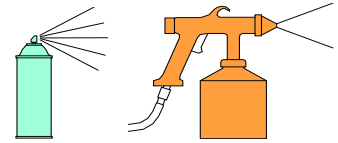
Electric cable insulation



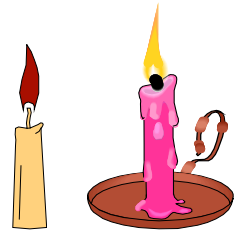
Fuel tank coatings



Inks and paints

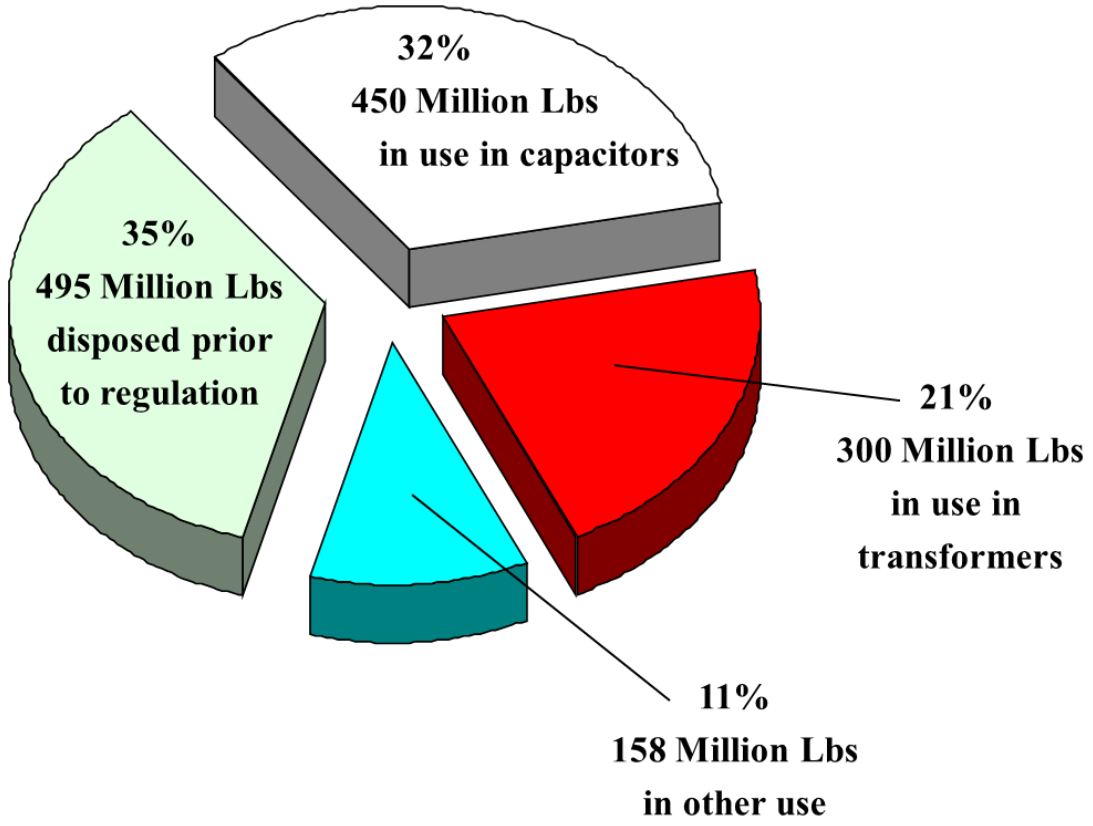


Pesticide extenders



Casting Wax

Use of PCBs between 1930-1975



1930-1975 TOTAL: 1,403 Million Lbs produced

PCB Releases and Exposure

- PCBs do not break down easily and can remain in the environment for long periods in the air, water, and soil.
- Today, PCBs can still be released into the environment from:
  - Poorly maintained hazardous waste sites that contain PCBs
  - Illegal or improper dumping of PCB wastes
  - Leaks or releases from electrical equipment and PCB containing products (e.g. fluorescent light ballast, caulk, paint, etc.)
  - PCBs inadvertently generated in manufacturing processes (e.g. pigments and dyes used in inks, textiles, paper, cosmetics, leather, and other materials)
- Exposure to PCB has been demonstrated to have the potential to cause a variety of health issues, such as cancer, and immune and neurological effects.

Toxic Substances Control Act (TSCA)

- TSCA was enacted in 1976 to prevent unreasonable risk of injury to human health or the environment associated with the manufacture, processing, distribution in commerce, use, or disposal of chemical substances.
- Since 1978 under TSCA section 6(e), EPA has promulgated numerous rules addressing PCBs.

PCB Cleanup and Disposal Program

- EPA ensures the public is protected from the harmful effects of PCBs by imposing prohibitions and requirements for the manufacturing, processing, distribution, use, and disposal of PCBs through the PCB regulations. These regulations are codified in **part 761 of Title 40 of the Code of Federal Regulations (CFR).**
- The rules, however, authorize certain uses of PCBs and PCB-containing items.
- The PCB Cleanup and Disposal Program benefits communities by ensuring that sites contaminated with PCBs are cleaned up to reduce risks and by ensuring that materials contaminated with PCBs are safely managed and disposed of in landfills or destroyed in other types of waste management units.

New PCB Rulemaking

Background on the Proposed Rulemaking

- EPA published the proposed rulemaking in the Federal Register on October 22, 2021. Public comments were received until January 20, 2022.
- EPA received 30 sets of public comments, which we used to inform the final rulemaking. EPA also thoroughly addressed and responded to all comments.
- The public comments as well as our response to comments are available in the docket of the Federal Register.

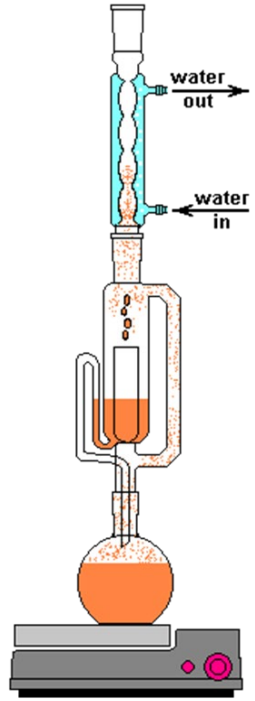
https://www.regulations.gov/docket/EPA-HQ-OLEM-2021-0556

New PCB Rulemaking Effective February 26, 2024

- On August 29, 2023, EPA finalized regulatory changes that address several key issues related to implementing the PCB Cleanup and Disposal Program under the Toxic Substances Control Act, including:
  - expanding the available options for extraction and determinative methods used to characterize and verify the cleanup of PCB waste under the federal TSCA regulations (also referred to as the PCB regulations),
  - adding more flexible provisions to facilitate cleanup and protective disposal of waste generated by spills that occur during emergency situations (e.g., hurricanes or floods),
  - adding amendments to the performance-based disposal option for PCB remediation waste by adding explicit cleanup provisions, including the requirement to notify EPA and follow specific sampling protocols,
  - removing the provision allowing PCB bulk product waste to be disposed of as roadbed material to improve protectiveness of human health and the environment, and
  - harmonizing the general disposal requirements for PCB remediation waste and makes other amendments to improve the implementation of the regulations, clarify ambiguity, and correct technical errors.
- View the final rule in the *Federal Register.*

Addition of Extraction Methods

- For extraction of PCBs from solid matrices, EPA is adding:
  - Method 3541 (Automated Soxhlet Extraction),
  - Method 3545A (Pressurized Fluid Extraction), and
  - Method 3546 (Microwave Extraction).
- For extraction of PCBs from aqueous matrices, EPA is adding:
  - Method 3510C (Separatory Funnel Liquid-Liquid Extraction),
  - Method 3520C (Continuous Liquid-Liquid Extraction), and
  - Method 3535 (Solid-Phase Extraction).
- Benefits: regulated parties will investigate, clean up, and dispose of PCB waste more quickly, efficiently, and economically, with results that are as accurate as or more accurate than the results using method 3540C or 3550B.
- Public Comments were generally supportive.



Updates to Ultrasonic Extraction

- EPA proposed to remove ultrasonic extraction (EPA Method 3550C) from the PCB regulations.
- Available studies on Ultrasonic Extraction collectively demonstrate concerns about the inconsistent performance of the method and the robustness of extractions for certain matrices of interest to the TSCA PCB Cleanup and Disposal Program for compliance testing.
- However, the Agency agrees with comments indicating the method is appropriate for wipe samples, because PCBs do not have the same extraction kinetics or extraction efficiency limitations from wipe samples containing relatively small amounts of particulates as they may have in some types of bulk solid samples (*e.g.*, wet clay or caulk).
- Therefore, after addressing the public comments EPA decided to allow Method 3550C for wipe samples only.

Updates to Determinative Methods

- EPA proposed to add three determinative methods to the PCB regulations:
  - Method 8082A (Polychlorinated Biphenyls (PCBs) By Gas Chromatography),
  - Method 8275A (Semivolatile Organic Compounds (PAHs and PCBs) In Soils/Sludges and Solid Wastes Using Thermal Extraction/Gas Chromatography/Mass Spectrometry (TE/GC/MS)), and
  - Method 1668C (Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids and Tissue by HRGC/HRMS).
- The Agency is finalizing the addition of Method 8082A but is not adding Method 8275A or Method 1668C to the PCB regulations, due to the public comments. The main deciding factor is that the regulated community expressed satisfaction with using Method 8082 and/or Method 8082A for analysis and indicated that there is not a need to use other methods on a broad scale.
- Although EPA is not adding Method 8275A and Method 1668C as determinative methods to the regulations, the Agency notes that these methods, as well as other methods that have been published since the proposed rule, such as CWA Method 1628, may be appropriate and useful in certain situations.

Performance-based Cleanup under 761.61(b)

- Cleanup Levels
- Excluded Sites
- Verification Sampling
- Recordkeeping
- Post-Cleanup Notification
- Expanded Disposal Options

Adding Cleanup Provisions to 61(b)

EPA is amending § 761.61(b) to add conditions to improve protection of human health and the environment for performance-based cleanup of PCB remediation waste.

This includes:

- Establishing cleanup levels for sites remediated under § 761.61(b);
  - Used lowest values found in the PCB regulations for bulk PCB remediation waste, porous surfaces, liquids, and nonporous surfaces.
- Limiting applicability of this option to sites that are not near sensitive populations or environments, e.g., surface waters, drinking water sources, schools/daycares.
  - List derived mainly from § 761.61(a)
- Requiring verification sampling;
  - Used existing sampling procedures from the regulations – Subpart O, P, and § 761.269.
- Applying recordkeeping requirements from the PCB Spill Cleanup Policy;
- Requiring post-cleanup notification to EPA, including:
  - Site identification information, disposal facility and shipment information, a summary of all applicable records in § 761.125(c)(5); and certification using the language in § 761.3.
- Allowing for disposal of non-liquid PCB remediation waste in RCRA Subtitle C permitted landfills.

Disposal of PCB Bulk Product Waste as Roadbed

- EPA is finalizing its proposal to remove the option in § 761.62(d)(2) to dispose of PCB bulk product waste under asphalt as part of a roadbed, as it is no longer deemed safe by new research.
- Public comments were supportive of this change, and it will have minimal economic impact.

Flexible Provisions for Emergency Situations

EPA is adding 2 options to increase flexibility and practicality for cleanup of spills caused by and managed in emergency situations.

- **Modifying the Spill Cleanup Policy**
  - Permissions to use the as-found PCB concentrations in the spill materials when it is not possible to readily determine the source concentration.
  - More flexible notification timeframes when adverse conditions persist.
- **Creating a waiver option**
  - EPA is adding a provision to allow individuals to request a waiver from PCB cleanup and disposal requirements in emergency situations.
  - Waiver request includes:
    - Information about the spill;
    - Description of the regulatory requirements to be waived or modified and an explanation of why compliance would be impracticable;
    - The plan for how the waste would be managed if the relief described was granted; and
    - Proximity to sensitive ecosystems or populations and how those areas and potential impacts will be addressed.

Harmonizing
PCB Remediation Waste Disposal Requirements

- EPA is finalizing an amendment to § 761.50(b)(3)(ii) to remove a phrase that was added erroneously in 1998, which produced inconsistency between this provision and the existing definition of PCB remediation waste in § 761.3.

  (ii) Any person responsible for PCB waste that was either placed in a land disposal facility, spilled, or otherwise released into the environment on or after April 18, 1978, but prior to July 2, 1979, where the concentration of the spill or release was ≥ 500 ppm; or placed in a land disposal facility, spilled, or otherwise released into the environment on or after July 2, 1979, where the concentration of the spill or release was ≥ 50 ppm, must dispose of it in accordance with either of the following:…

- Some industry groups have interpreted the existing reg language to mean that PCB remediation waste under 50 ppm is not regulated for disposal, which is incorrect.

Finalized Changes to Annual Reports

- Removing the provision to lists manifest tracking numbers.[1]
- Adding the requirement to use a standard annual report form.[2]
- Addressing the annual report form to the Director or ORCR by mail or email instead of the Regional Administrator.
- Modifying the categories of PCB waste in the manifest requirements to align with the categories from the annual reports, and adding a sixth category; “Other”.[3]

[1] § 761.180(b)(3)(ii) marked as [Reserved].
[2] § 761.180(b)(3)
[3] § 761.207(a), § 761.180(b)(3)(iii)-(vi)

New Annual Report Form

United States Environmental Protection Agency
PCB ANNUAL REPORT FORM
40 CFR 761.180(b)(3)

Form Approved
OMB No. XXXX

1. Submitter Information

Name: _____ **Job Title:** _____
Phone Number: _____ **Email Address:** _____

2. Facility EPA ID Number

EPA ID Number: _____

3. Facility Name and Address

Facility Name: _____
Street Address: _____
City: _____ **State:** _____ **Zip Code:** _____

4. Reporting Calendar Year

Calendar Year: _____

5. Facility Type

◯ Commercial Storer ◯ Disposer ◉ Both

6. Technology Type (check all that apply)

☐ Incinerator ☐ Chemical Dechlorination ☐ Chemical Waste Landfill
☐ High Efficiency Boiler ☐ Scrap Metal Recovery Oven
☐ Fluorescent Light Ballast Recycler ☐ PCB Electrical Cable Processing for Metal Recovery
☐ PCB Transformer Decommissioning ☐ Pipeline and Compressor Systems Decontamination
☐ Other_____

7. PCB Waste in Storage at the Beginning of the Calendar Year

	Large Low and High Voltage Capacitors	Article Containers	Transformers	Bulk	Containers	Other
Weight (kg)						
Total Number						

8. PCB Waste Received and Generated During the Calendar Year

(1)	Large Low and High Voltage Capacitors		Article Containers		Transformers	
	Received	Generated	Received	Generated	Received	Generated
Weight (kg)						
Total Number						

EPA ID Number [ ] Calendar Year [ ]

(2)	Bulk		Containers		Other	
	Received	Generated	Received	Generated	Received	Generated
Weight (kg)						
Total Number	N/A	N/A				

9. PCB Waste Transferred to Another Facility During the Calendar Year

	Large Low and High Voltage Capacitors	Article Containers	Transformers	Bulk	Containers	Other
Weight (kg)						
Total Number				N/A		

10. PCB Waste Disposed of at the Facility During the Calendar Year

	Large Low and High Voltage Capacitors	Article Containers	Transformers	Bulk	Containers	Other
Weight (kg)						
Total Number				N/A		

11. PCB Waste in Storage at the Facility at the end of the Calendar Year

	Large Low and High Voltage Capacitors	Article Containers	Transformers	Bulk	Containers	Other
Weight (kg)						
Total Number				N/A		

12. Number of Manifests Sent/Received

Number of Incoming Manifests: _____
Number of Outgoing Manifests: _____
Total Number of Manifests: 0

Supplemental Amendments

Improve implementation of existing requirements

- For example:
  - Request email address on notification form for streamlined processing and quick responses
  - Update several ASTM methods previously incorporated by reference to the more recent versions

Clarify regulatory ambiguity

- For example:
  - Add a form for annual reports submitted by commercial storers and disposers of PCB waste
  - Add a definition for “as-found” because the as-found concentration is the basis for several regulatory requirements.

Correct technical errors in the regulations

- For example:
  - Update the mailing address for annual reports and notification of PCB activity forms
  - Change references from “he” to the gender neutral “they.”

Benefits of the Rule

Environmental Justice Benefits of the Rule

Generally, the rule modernizes the PCB regulations, making it easier and more affordable to clean up contaminated sites, while continuing to ensure that the requirements remain protective.

- By streamlining all PCB cleanups, disadvantaged communities are expected to benefit from quicker, more cost-effective, compliant cleanups.
- Specifically, adding explicit cleanup provisions under § 761.61(b), will provide assurance that sites are properly remediated and enable compliance assistance/enforcement.
- Flexibility for emergency situations will allow the Agency to work collaboratively with industry to quickly respond to catastrophic disasters, which often disproportionately impact communities facing EJ issues.

Climate Change Benefits of the Rule

Allowing alternate extraction methods will greatly reduce the amount of solvent used, which supports EPA's Greener Cleanups initiative and reduces the amount of waste generated from PCB cleanups.

Additional flexibility for emergency situations will become increasingly important as natural disasters become more frequent and severe. The proposed regulatory changes will allow the Agency to expedite basic cleanups and customize requirements for complex situations.

Economic Costs & Benefits of the PCB Rule

PROPOSED RULE PROVISION	NET COST SAVINGS			
	LOW		HIGH	
	ANNUALIZED	PRESENT VALUE	ANNUALIZED	PRESENT VALUE
3 PERCENT DISCOUNT RATE				
PCB Extraction Methods	$6,571,000	$131,100,000	$6,571,000	$131,100,000
§ § 761.61(b)	$9,751,000	$145,100,000	$11,520,000	$171,400,000
PCB BPW as Roadbed	($736)	($10,950)	($6,626)	($98,580)
Total	**$15,190,000**	**$256,300,000**	**$16,860,000**	**$281,100,000**
7 PERCENT DISCOUNT RATE				
PCB Extraction Methods	$4,690,000	$93,310,000	$4,690,000	$93,310,000
§ § 761.61(b)	$9,751,000	$103,300,000	$11,520,000	$122,000,000
PCB BPW as Roadbed	($736)	($7,800)	($6,626)	($70,200)
Total	**$14,440,000**	**$196,600,000**	**$16,200,000**	**$215,300,000**
Emergency Situations	Non-quantifiable net cost savings			
Determinative Methods	No economic impact			
§ § 761.50(b)(3)	No economic impact			

PCB Program Contacts

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PCBs Inquires Inbox - ORCRPCBs@epa.gov