

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

Informational Webinar

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Office of Resource Conservation and Recovery

Overview

Introduction

1. Background on PCBs and the PCB Extraction Rulemaking

PCB Rulemaking Overview

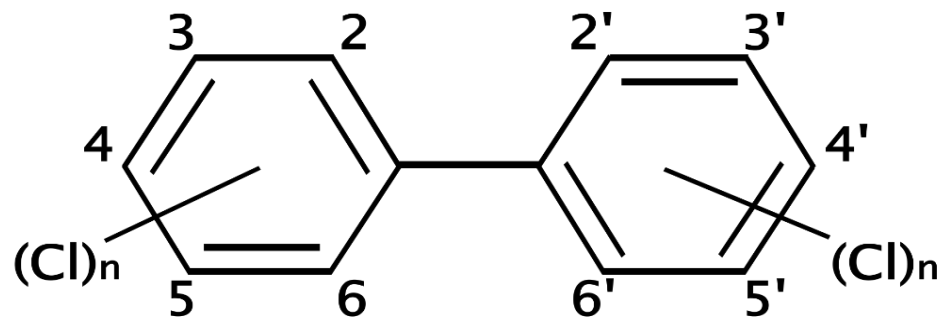
2. Addition of Extraction Methods
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7. Flexible Provisions for Emergency Situations
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Tribal Implications and Public Comments

Questions

What are Polychlorinated Biphenyls (PCBs)?

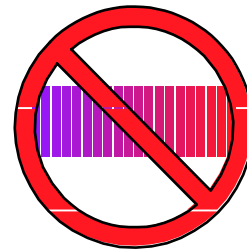
- PCBs are a group of man-made organic chemicals consisting of carbon, hydrogen, and chlorine atoms. The number of chlorine atoms and their location in a PCB molecule determine many of its physical and chemical properties.
- In the United States, PCBs were commercially manufactured from 1929 until production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



Physical Properties of PCBs



Odorless



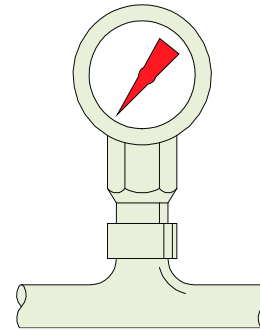
Colorless



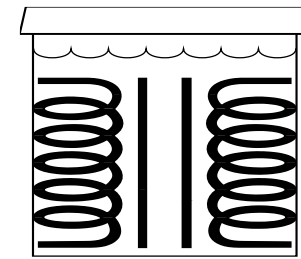
Viscous liquid or solid



Flame retardant

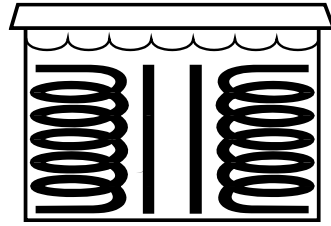


Low vapor pressure

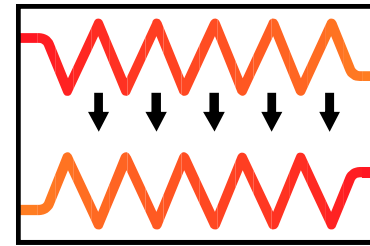


Low electrical conductivity

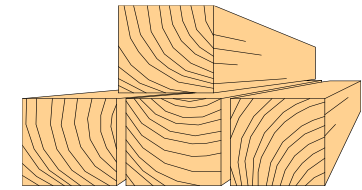
Historical Uses of PCBs



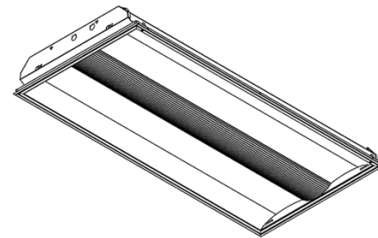
Dielectric fluid



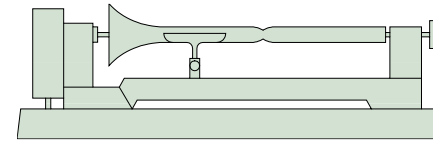
Heat transfer fluid



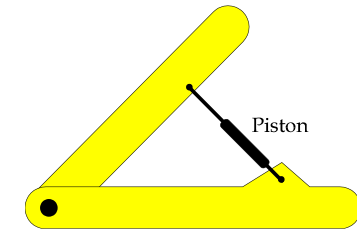
Construction materials (ex. caulk, sealants, tiles, etc.)



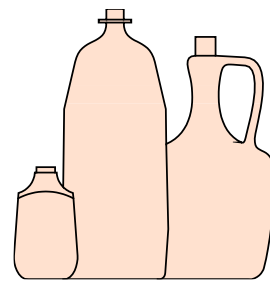
Fluorescent light ballasts



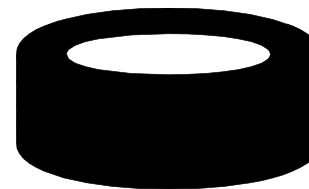
Cutting oils



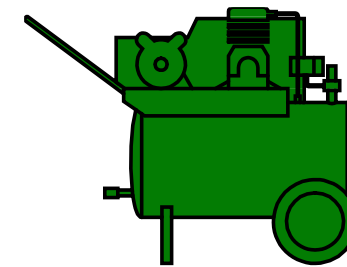
Hydraulic fluid



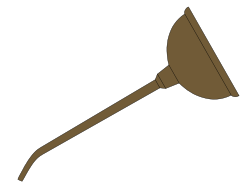
Plasticizer



Gaskets & Damping felt

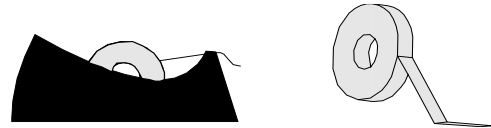


Vacuum pump fluid

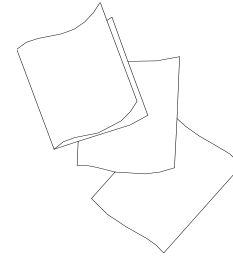


Lubricants

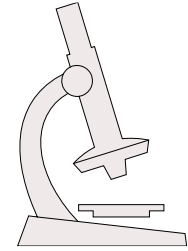
Historical Uses of PCBs - continued



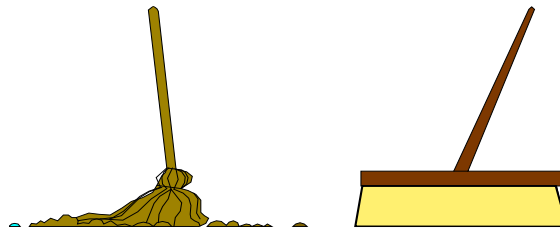
Adhesives



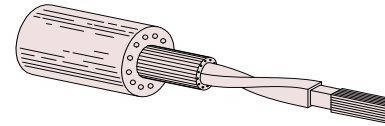
Carbonless copy paper



Microscopy
(mounting media & immersion oil)



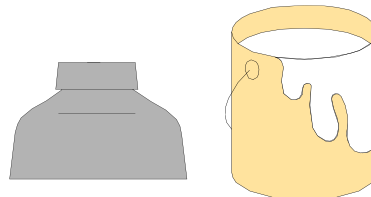
De-dusting Agents



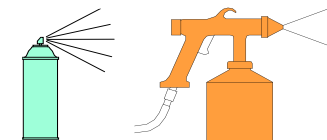
Electric cable insulation



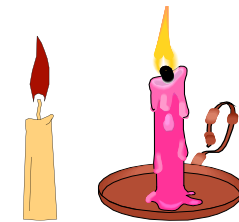
Fuel tank coatings



Inks and paints

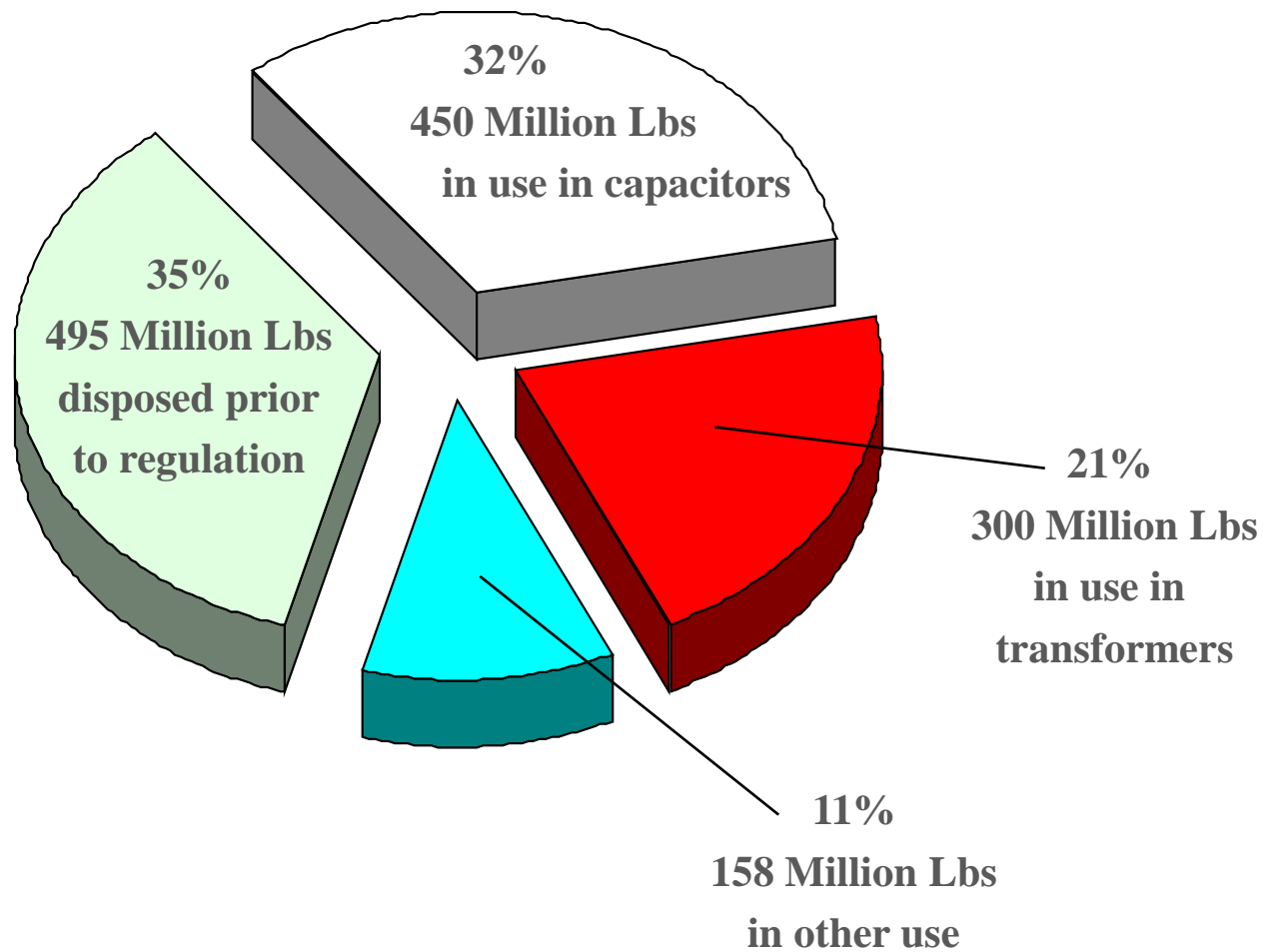


Pesticide extenders



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 transformers containing PCBs
 - PCBs inadvertently generated in manufacturing processes
- 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 all aspects of the life cycle of 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.

PCB Extraction

- EPA is pursuing a Rulemaking to allow for more flexibility in the allowable extraction methods for PCB wastes.
- What is Extraction?
 - Extraction is a separation process consisting of the separation of a substance from a matrix (e.g., PCBs from soil).
 - PCB Extraction methods use a strong chemical solvent such as acetone or toluene and sometimes vibration, heat, or pressure, to separate PCBs from the solid materials (e.g., soils, concrete, caulk). The resulting “extract” is then analyzed to obtain the concentration.



Background on the PCB Extraction Rulemaking

- The PCB Regulations prescribe very limited methods for how to extract PCBs from samples of contaminated media and have not been updated since 1979.
- Adding alternate EPA Methods to the PCB Regulations would give the regulated industry more flexibility in selecting extraction methods for PCBs, cutting down on costs and reducing delays in the sampling process.
- Many of these newer methods also use less solvent than the methods currently allowed for, which supports EPA's initiatives for Greener Cleanups.
- In addition, we were also able to include several other necessary technical amendments and corrections in this rulemaking.

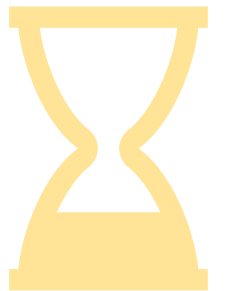


Addition of Extraction Methods

- For extraction of PCBs from solid matrices, EPA is proposing to add:
 - Method 3541 (Automated Soxhlet Extraction),
 - Method 3545A (Pressurized Fluid Extraction), and
 - Method 3546 (Microwave Extraction).
- For extraction of PCBs from aqueous matrices, EPA is proposing to add:
 - Method 3510C (Separatory Funnel Liquid-Liquid Extraction),
 - Method 3520C (Continuous Liquid-Liquid Extraction), and
 - Method 3535 (Solid-Phase Extraction).

Addition of Extraction Methods - continued

- These methods are already widely used in both EPA and commercial laboratories for PCB extraction.
- Also, they have benefits over Manual Soxhlet Extraction, including quicker processing time (few hours vs 24 hours), less physical equipment space, less solvent use, and energy savings.
- Adding alternative extraction methods to the regulations will help the regulated community 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 3540C or 3550B.



Removal of Ultrasonic Extraction

- The text in EPA **Method 3550B** includes caveats that ultrasonic extraction may not be as rigorous as other extraction methods and highlights the importance of following the method explicitly. This causes concern that this method may provide poor extraction efficiencies if conducted improperly.
- Also, previous studies done on the extraction efficiency of ultrasonic extraction methods have provided inconsistent results. Some studies have shown that ultrasonic extraction is equivalent to other extraction methods, and, in others, ultrasonic extraction had a lower extraction efficiency.
- Therefore, EPA is proposing to **remove ultrasonic extraction** methods from the PCB regulations because it does not consistently produce reliable results and has the potential to be conducted improperly.



Addition of Determinative Methods

- Currently, the PCB regulations list **Method 8082** (Polychlorinated Biphenyls (PCBs) by Gas Chromatography) as the only method for determining PCB concentrations in samples.
- EPA investigated additional determinative methods to include in this rulemaking, which may provide flexibility for the regulated community and reduce the administrative burden on the Agency by reducing the number of approvals processed for alternative methods.



Addition of Determinative Methods - continued

- EPA is proposing to add three determinative methods to the PCB regulations:
 - SW-846 Method 8082A (Polychlorinated Biphenyls (PCBs) By Gas Chromatography);
 - SW-846 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
 - Clean Water Act (CWA) Method 1668C (Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS).

Adding Cleanup Provisions to 61(b)

- The existing PCB regulations allow for three options to conduct cleanup of PCB remediation waste. One of those options, 761.61(b), is performance-based, allowing for clean-up by site owners with no involvement by EPA.
- EPA is proposing to **amend 761.61(b)** to include explicit conditions for on-site remediation and cleanup of PCB remediation waste. This includes:
 1. **Establishing cleanup levels** for sites remediated under 761.61(b);
 - For bulk PCB remediation waste and porous surfaces, ≤ 1 ppm PCBs.
 - For liquids, the concentrations specified in 761.79(b)(1) and (b)(2).
 - For nonporous surfaces, the concentrations specified in 761.79(b)(3).



Adding Cleanup Provisions to 61(b) - continued

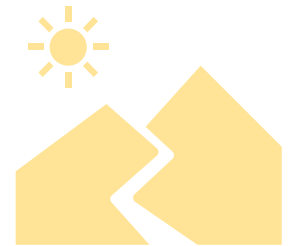
2. Limiting applicability of this option to sites that are not near sensitive populations or environments; namely, **excluding**:
 - Surface or ground waters,
 - Sediments in marine and freshwater ecosystems.
 - Sewers or sewage treatment systems.
 - Any private or public drinking water sources or distribution systems.
 - Grazing lands.
 - Vegetable gardens.
 - Sites which are adjacent to, contain, or are proposed to be redeveloped to contain: residential dwellings, hospitals, schools, nursing homes, playgrounds, parks, day care centers, endangered species habitats, estuaries, wetlands, national parks, national wildlife refuges, commercial fisheries, sport fisheries, or surface waters.
 - Sites where the as-found PCB contamination is in the 100-year floodplain.

Adding Cleanup Provisions to 61(b) - continued

3. Requiring **verification sampling**;
 - For bulk PCB remediation waste and porous surfaces, must be conducted in accordance with Subpart O.
 - For nonporous surfaces, must be conducted in accordance with Subpart P.
 - For liquid PCB remediation waste, must be conducted in accordance with 761.269.
4. Apply **recordkeeping** requirements from the Spill Cleanup Policy at 761.125(c)(5);
5. Requiring **post-cleanup notification**, including:
 - Site identification information, including the site address and the name, phone number, and email address of the site contact;
 - Disposal facility and shipment information, including the disposal facility's name and address, the manifest tracking number(s), and the quantity of waste shipped;
 - A summary of all applicable records in 761.125(c)(5); and
 - A certification using the language in 761.3.
6. Allowing for disposal of non-liquid PCB remediation waste in RCRA Subtitle C permitted landfills.

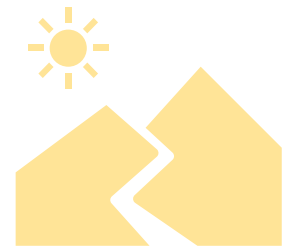
Disallowing Disposal of PCB Bulk Product Waste as Roadbed

- EPA is proposing **to remove the option in 761.62(d)(2)** to dispose of PCB bulk product waste under asphalt as part of a roadbed.
- Since the addition of this provision to the PCB regulations, bulk product waste has been documented to leach PCBs to adjacent surfaces, which indicates a significant risk of PCB migration to, for example, stormwater and soil, from under asphalt.
- EPA questions whether potential leaching of PCBs from bulk product waste used as roadbed could lead to environmental releases of PCBs and potential exposures to humans and wildlife.



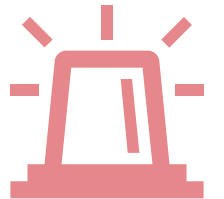
Disallowing Disposal of PCB Bulk Product Waste as Roadbed - continued

- As a result, EPA no longer has a basis to support the determination of no unreasonable risk of injury to health or the environment that the Agency made in 1998.
- Facilities that would have used PCB bulk product waste on-site as roadbed under asphalt would now have to pay to transport the waste to a municipal solid waste landfill and pay the associated tipping fee for disposal.
- Responsible parties could still apply for a risk-based disposal approval under 761.62(c) to dispose of bulk product waste as roadbed if EPA finds (which is done on a site-specific) basis that it presents no unreasonable risk to human health or the environment.



Flexible Provisions for Emergency Situations

- EPA is proposing to add two options for cleanup of spills caused by and managed in emergency situations.
- Modifying the Spill Cleanup Policy
 - EPA proposes to add flexibility to the PCB Spill Cleanup Policy for cleanup of spills caused by and managed in emergency situations, such as hurricane or floods.
 - Responsible parties may use the as-found concentrations in the spill materials when determining whether to manage the spill under 761.125(b) or (c) when it is not possible to readily determine the spill source concentration at a site.
 - The applicable notifications in 761.125(a)(1) must be submitted as soon as possible, but no later than seven (7) days after the adverse conditions have ended.



Flexible Provisions for Emergency Situations - continued

- Creating a waiver option
 - EPA is proposing to add provisions to allow individuals to request a waiver from requirements in 761.60, 761.61, 761.62, and 761.65, in emergency situations.
 - Waiver request includes:
 - Point of contact information.
 - Location(s) of the release(s).
 - The type(s) of material(s) that are contaminated and the source of the release, if known.
 - The as-found PCB concentrations in the PCB waste, unless the materials are being managed as if they contain ≥ 500 ppm PCBs.
 - The provisions to be waived or modified and an explanation of why compliance with the existing provisions would be impracticable as a result of the emergency situation.
 - The plan for how the waste would be managed if the relief described was granted. Describe how this does not pose an unreasonable risk.
 - Whether or not the PCB waste is near, or likely to impact, sensitive ecosystems or populations and how those areas and potential impacts will be addressed.

Supplemental Amendments

Improve implementation of existing requirements

- Use of containers for storage at site of generation
- Modify language for financial instruments
- Remove manifest numbers from annual reports
- Modify waste categories on manifest
- Request email address on notification form
- Update select ASTM methods

Clarify regulatory ambiguity

- Medium density plastic is nonporous
- Add form for annual reports
- Define “as-found”
- Clarify 30-day Default for 761.61(a)
- PCB concentration in cap material
- Applicability of deed restrictions
- Alternate extraction and analysis under 761.61(c)/761.62(c)/761.79(h)
- Sampling procedure for nonporous surfaces



Supplemental Amendments - continued

Correct technical errors in the regulations

- Missing “µg” in listed concentration
- Wipe sampling under 761.30(i)(4)
- Liquids in high efficiency boilers
- Mailing address for annual reports and notification of PCB activity forms
- Remove reference to Method 3500B
- Correct references to SW-846 and EPA PCB website
- Change “he” to “they”
- Change “on site” to “on-site”
- Correct reference for standard wipe tests



Economic Impacts 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	\$5,954,000	\$118,800,000	\$5,954,000	\$118,800,000
§ 761.61(b)	\$9,240,000	\$137,500,000	\$10,910,000	\$162,400,000
PCB BPW as Roadbed	(\$661)	(\$9,835)	(\$5,950)	(\$88,520)
Total	\$15,190,000	\$256,300,000	\$16,860,000	\$281,100,000
7 PERCENT DISCOUNT RATE				
PCB Extraction Methods	\$4,249,000	\$84,520,000	\$4,249,000	\$84,520,000
§ 761.61(b)	\$9,240,000	\$97,890,000	\$10,910,000	\$115,600,000
PCB BPW as Roadbed	(\$661)	(\$7,004)	(\$5,950)	(\$63,030)
Total	\$13,490,000	\$182,400,000	\$15,160,000	\$200,100,000
Emergency Situations	Non-quantifiable net cost savings			
Determinative Methods	No economic impact			
§ 761.50(b)(3)	No economic impact			

Status and Schedule Going Forward

- The proposed rule is currently undergoing interagency review through the Office of Management and Budget.
- We plan to propose the rulemaking in Fall 2021.



Tribal Implications and Consultation

- The consultation process for the Rulemaking is being conducted in accordance with the EPA Policy on Consultation and Coordination with Indian Tribes (<https://www.epa.gov/tribal/forms/consultation-andcoordination-tribes>).
- EPA does not expect that the proposed rule would have tribal implications as specified in Executive Order 13175. However, to the extent that Tribes manage PCB-contaminated waste subject to EPA's PCB regulations under the Toxic Substances Control Act, this proposed rule, if and when finalized, would apply in Indian country.
- EPA invites interested tribal governments to consult with us prior to issuance of the Proposed Rulemaking. To initiate government-to-government consultation with EPA or if you have questions related to the PCB Extraction Proposed Rulemaking, please contact Jennifer McLeod by phone at (703) 347-8169 or email at mcleod.jennifer@epa.gov by August 15, 2021.

Public Comment

- EPA will accept public comments on the PCB Extraction Proposed Rulemaking for 60 days after publication of the Federal Register notice announcing the Proposed Rulemaking.
- Tribes are encouraged to submit comments to the docket on the proposal, as well as any other information that you believe may be relevant to the development of the rule during the public comment period.
- All comments must be received no later than the end of the public comment period. The specific dates for the submittal of public comments will be available on EPA's Polychlorinated Biphenyls (PCBs) website at: <https://www.epa.gov/pcbs>.



Questions?

