PCB Remediation Waste Cleanup and Disposal

Training for Florida Department of Environmental Protection

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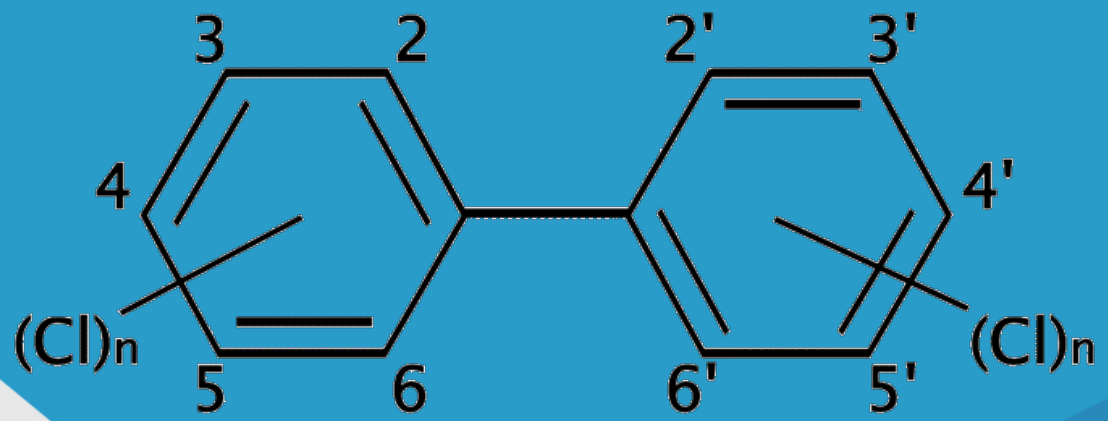
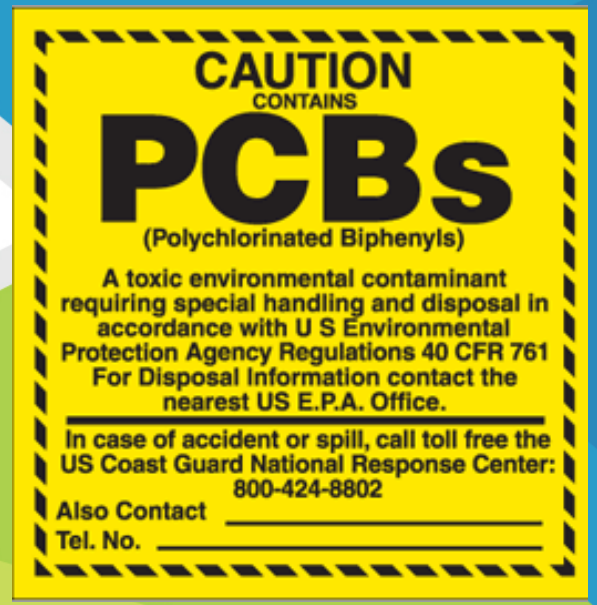
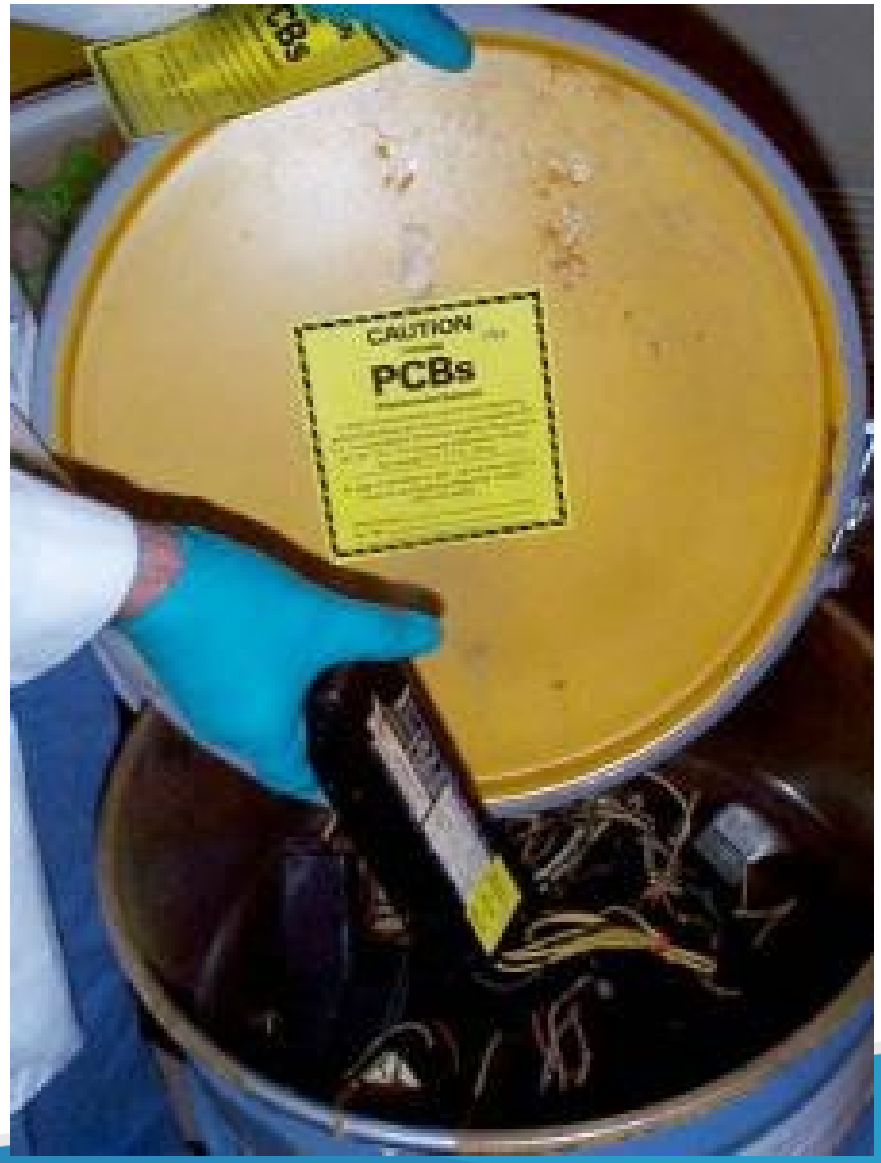
U.S. EPA, Region 4
February 23, 2021
(Webinar Microsoft Teams)



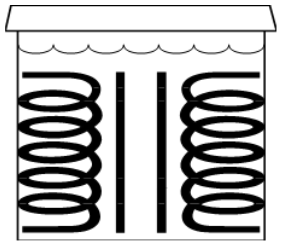


PCBs Overview

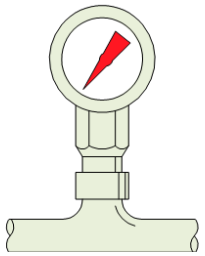
- PCBs – Properties and health concerns
- Regulatory history and structure
- Cleanup options
- Disposal options
- Resources
- Case Study
- Regional PCB contacts
- Questions



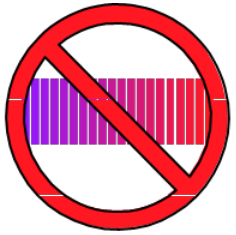
Flame retardant



Low electrical conductivity



Low vapor pressure

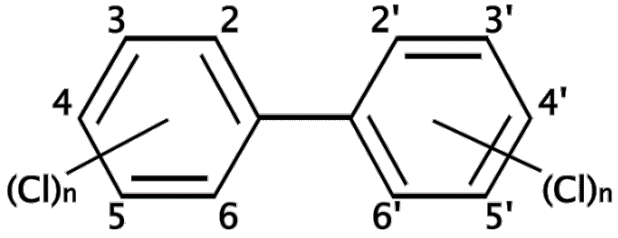


Colorless

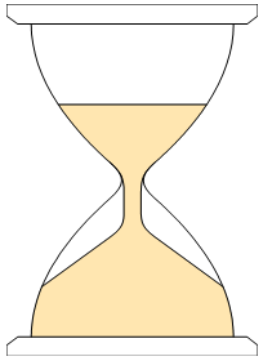
Viscous liquid or solid

Odorless

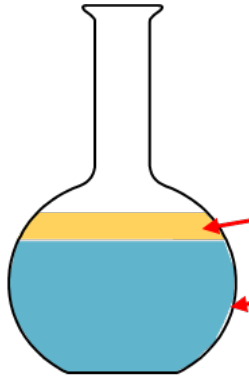
Physical Properties of PCBs



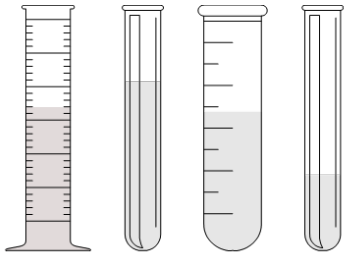
209 Congeners



Stable to aging



Lipophilic

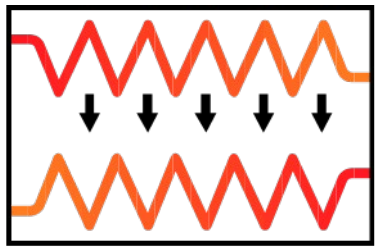


Used as mixtures of congeners commonly called Aroclors

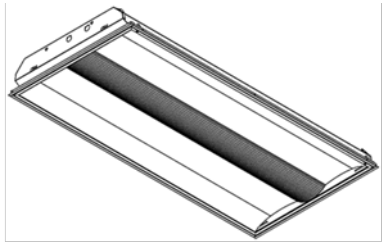
(Aroclor 1254 → 54% chlorine by mass)

Chemical Properties of PCBs

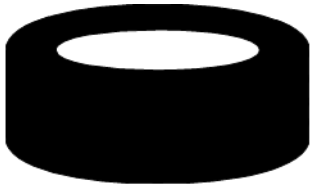
Uses of PCBs (~1950-1978)



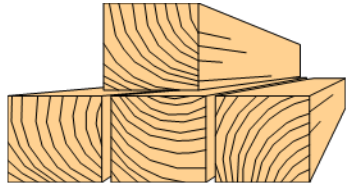
Heat transfer fluid



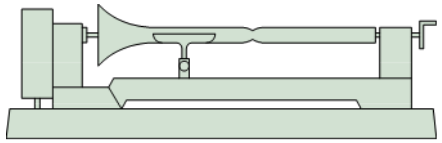
Fluorescent light ballasts



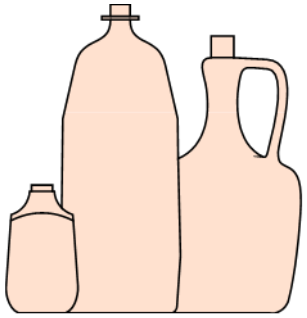
Gaskets & Damping felt



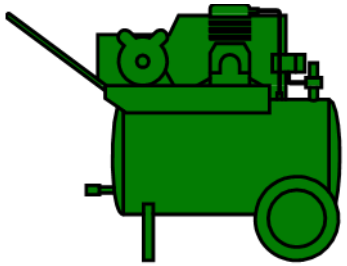
Construction materials (ex. caulk, sealants, tiles, etc.)



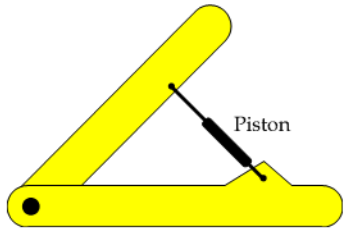
Cutting oils



Plasticizer

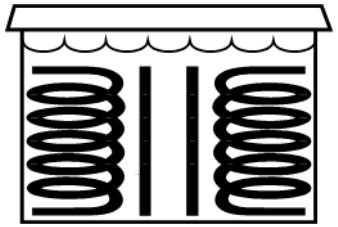


Vacuum pump fluid



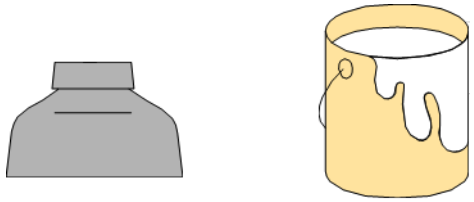
Hydraulic fluid

Lubricants



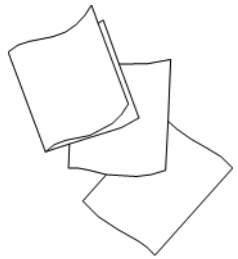
Dielectric fluid

Uses of PCBs (continued)



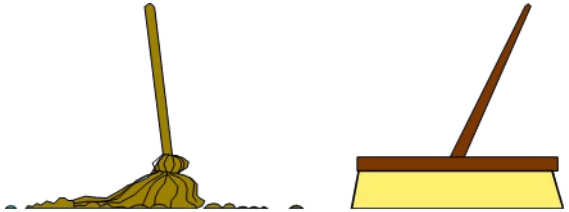
Inks and paints

Pesticide extenders



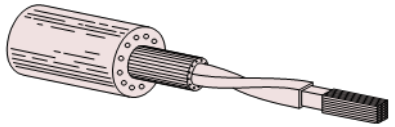
Carbonless copy paper

Fuel tank coatings



Dusting Agent

Microscopy
(mounting media & immersion oil)

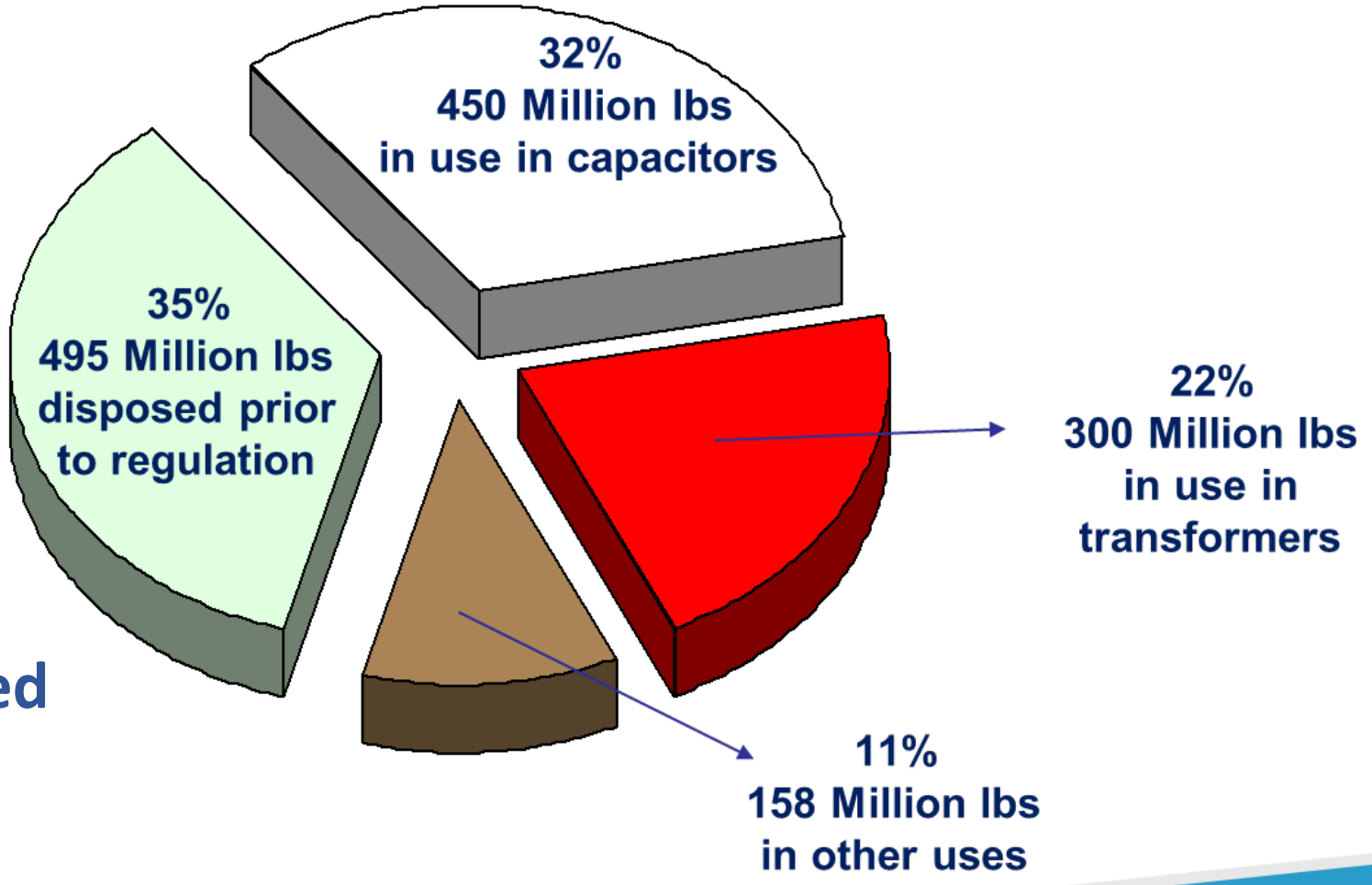


Electric cable insulation

Casting Wax

Adhesives

Use of PCBs Between 1930-1975

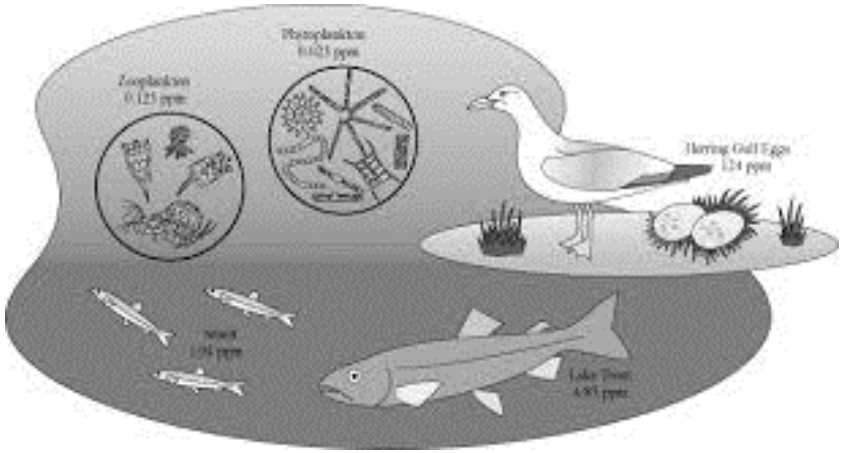


1930-1975
A Total of
1.4 Billion lbs was produced

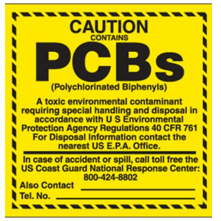
Environmental Transport

PCBs are persistent, bioaccumulative, and can be transported long distances

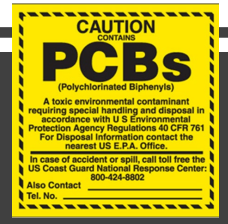
PCBs have been found in animals, snow, and sea water in areas far away from where they were released into the environment.



PCBs – Regulatory History

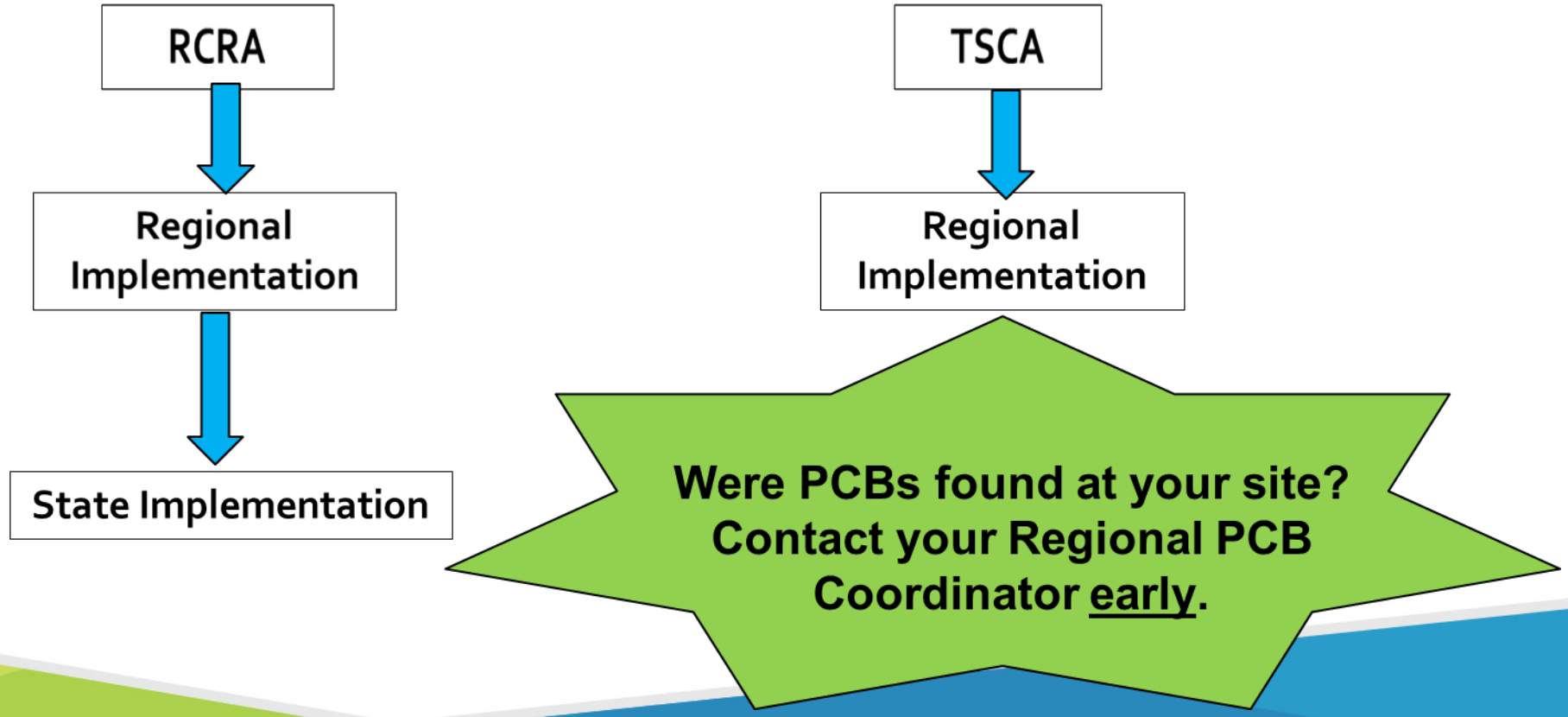


- **Manufactured in U.S. from 1929 – 1979**
- **Toxic Substances Control Act passed by Congress in 1976**
  - TSCA Section 6(e) banned the manufacture and use of PCBs
  - Allowed EPA to authorize limited uses through a rulemaking process
  - EPA issued regulations in 1979 for the use, manufacturing, processing, distribution in commerce, cleanup, and disposal of PCBs
  - 1998 “Mega Rule” – major changes to the cleanup and disposal sections
- **TSCA PCB Regulations found at 40 CFR 761**
- **PCB Cleanup and Disposal Program evolved separately from other cleanup and disposal programs**
  - Transferred the program to the “RCRA Office” (Office of Resource Conservation and Recovery) in 2007 but the regulations stayed the same
  - Regulations regarding the use of PCBs are still managed by the Office of Pollution Prevention and Toxics



Implementation of PCB Regs

Unlike RCRA, TSCA authority is *not* delegated to States.

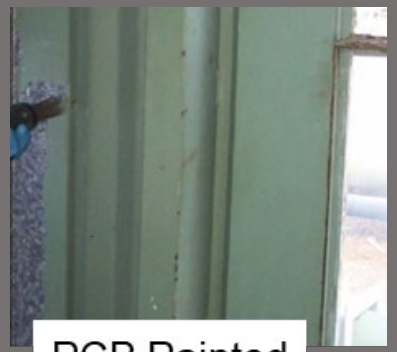


Indicators that you might have PCBs on your hands:

- **Equipment** - Labels, trade names, manufactured pre-1979
- **Building materials** – Product labels, structure built or renovated pre-1979
- **Cleanup Areas** – Wherever the following items were manufactured, stored, used, serviced, or transported
  - Electrical equipment, hydraulic presses, vacuum systems, natural gas compressor systems, aircraft hydraulic oils, dust suppression, etc.

However, even without these indicators, PCBs may still be present because:

- Labels were not required prior to 1979
- Servicing of uncontaminated equipment has led to cross-contamination and unintentional dilution
- Some uses were not well recorded



PCB Bulk Product Waste

(see 40 CFR 761.3 for full detail)

Any building built or renovated before 1979 is likely to have PCB-containing Bulk Product Waste (e.g., fluorescent light ballasts, caulk, paint, ceiling tiles, spray-on fireproofing, floor finishes).

1998 “Mega Rule” – major changes to the cleanup and disposal sections

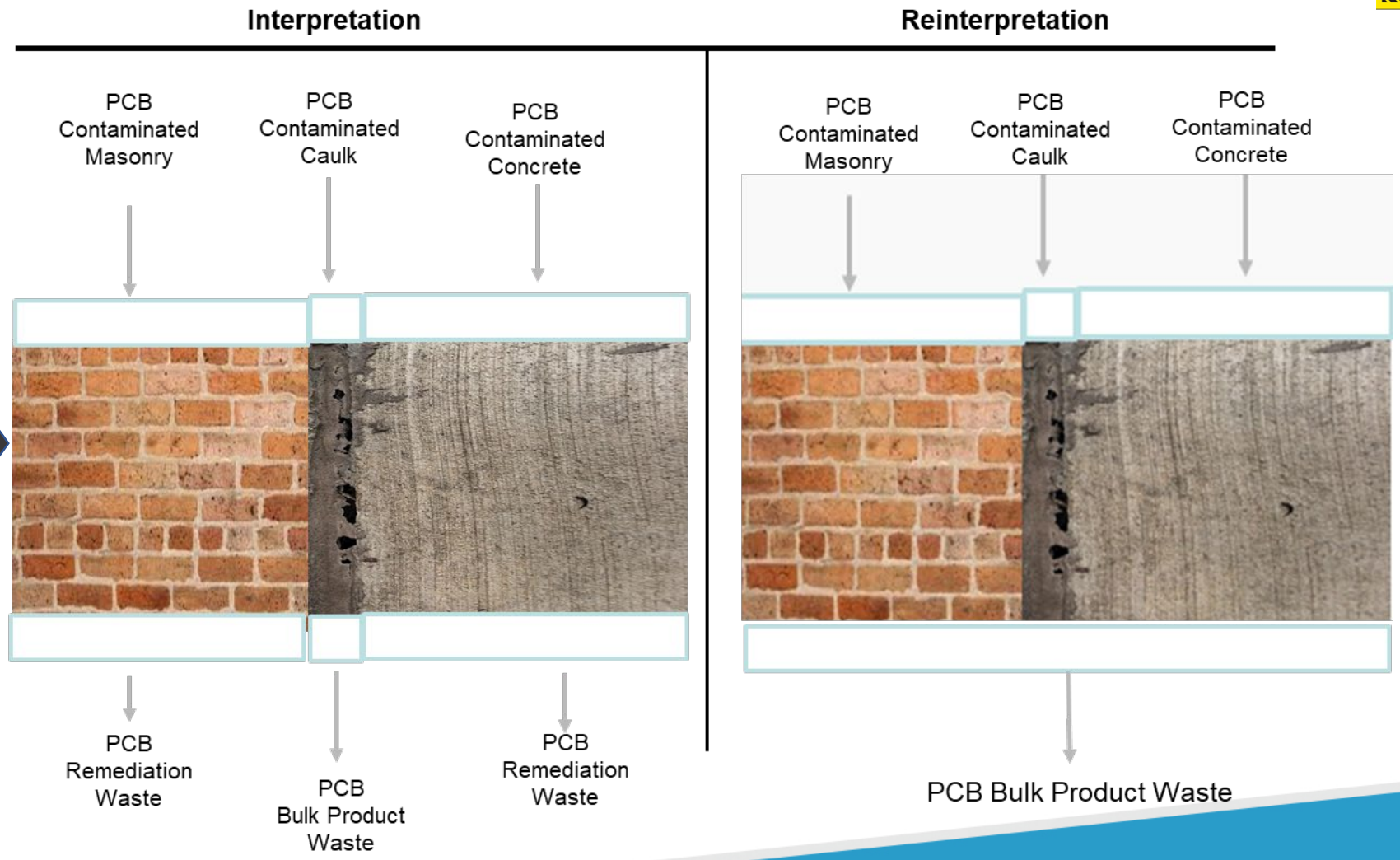
Manufactured products with ≥ 50 ppm are unauthorized and must be removed/disposed of under § 761.62.

Just be aware that there may be other PCB-containing waste at your site.

1998 "Mega Rule" – major changes to the cleanup and disposal sections

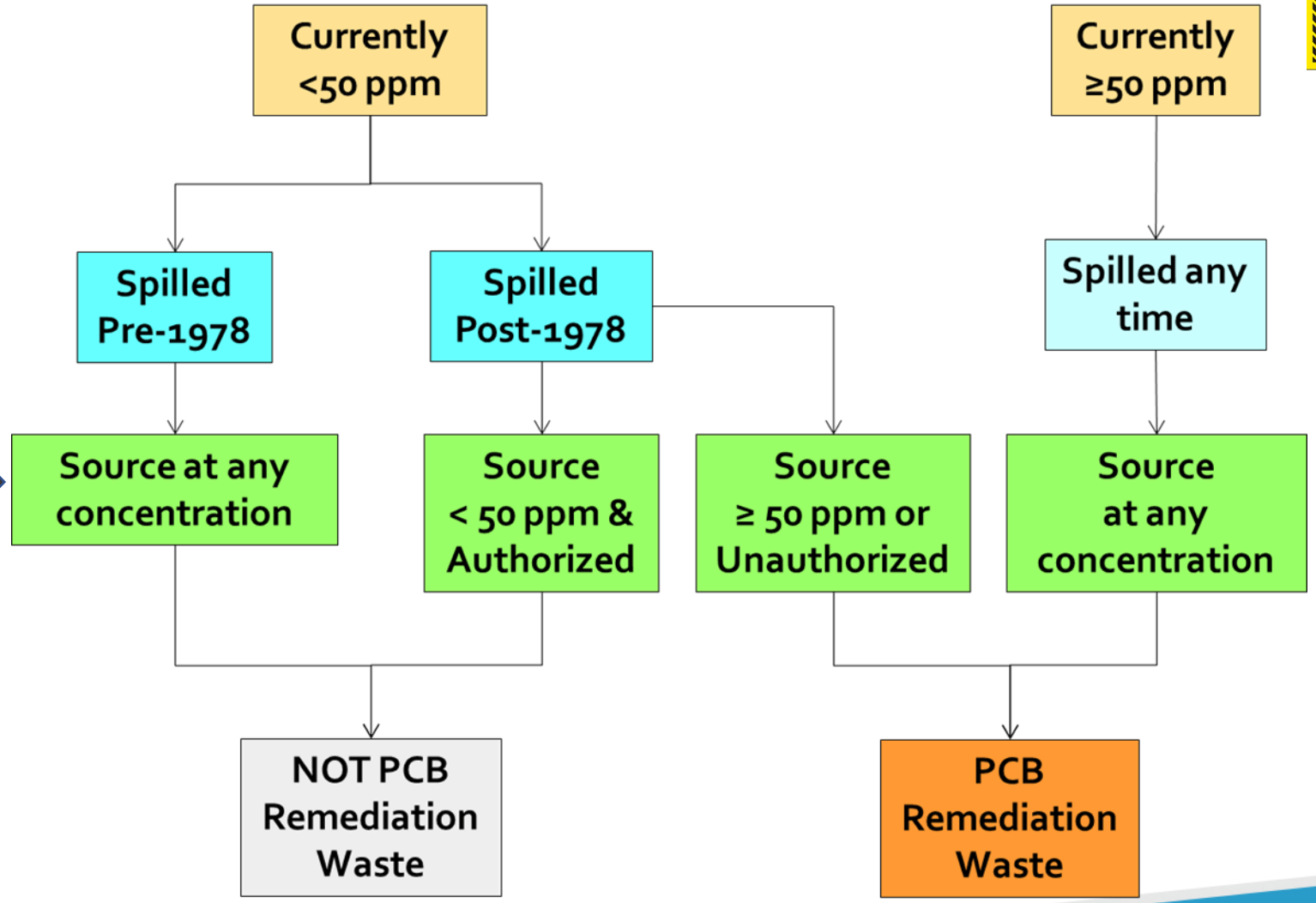
PCB Bulk Product Waste

see 40 CFR 761.3 for full details



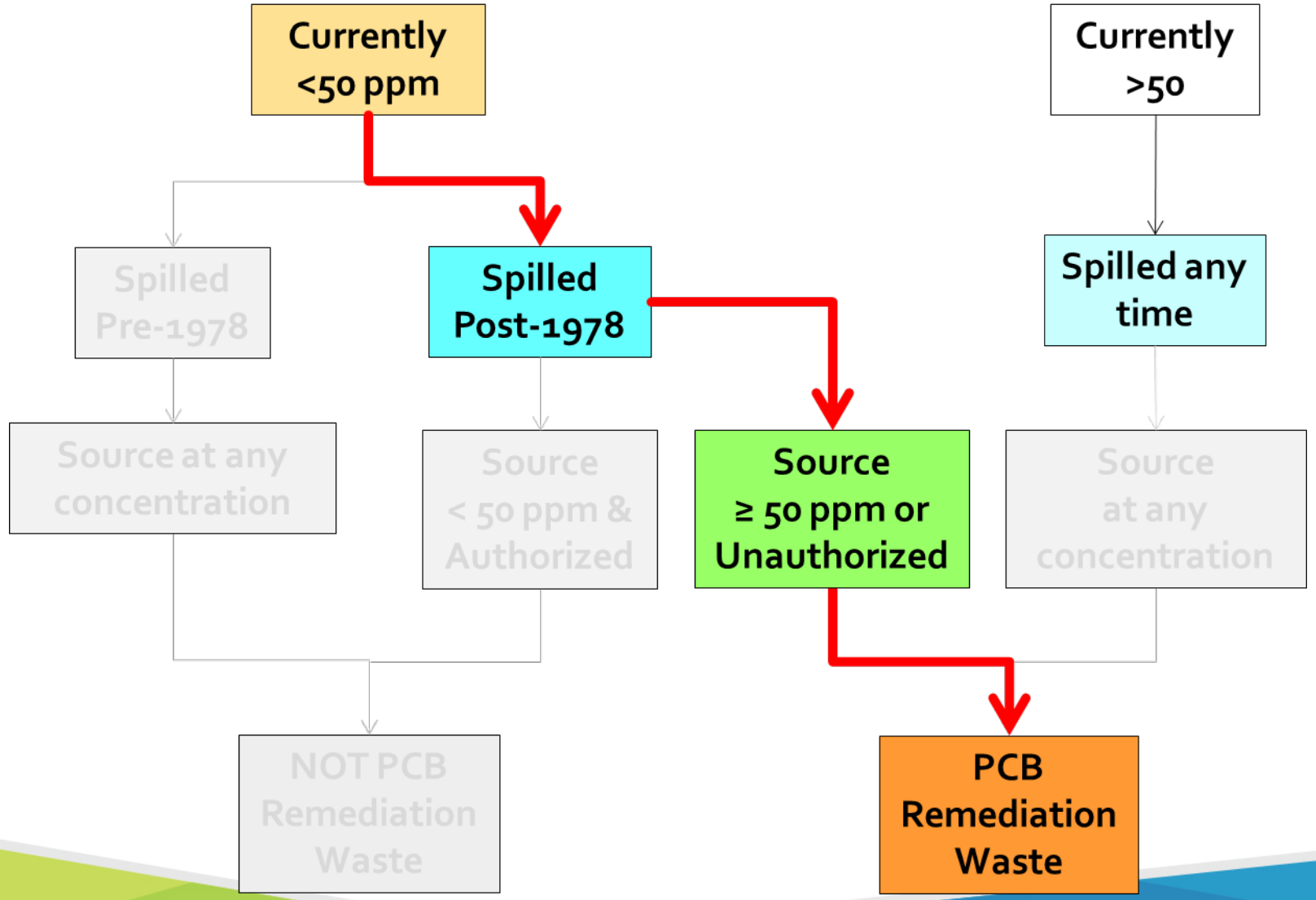
Definition of "PCB Remediation Waste"

see 40 CFR 761.3 for full details



Definition of "PCB Remediation Waste"

see 40 CFR 761.3 for full detail

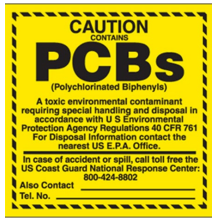


Key Takeaway Point:

Even if the material is < 50 ppm, it may still be regulated

PCB Remediation Waste Cleanup and Disposal

Option Basics



NOT PCB Remediation Waste

No cleanup or disposal obligations

No interaction with EPA

Any landfill

PCB Remediation Waste*

a

761.61(a)

Self Implementing Cleanup Option

Must notify EPA

Sampling requirements are prescriptive

Can send < 50 ppm to municipal landfill

b

761.61(b)

Performance Based Disposal Option

No notification required

All PCB Remediation Waste must go to a TSCA facility

Must remove all PCB waste > 1 ppm

c

761.61(c)

Risk Based Cleanup & Disposal

Requires EPA approval

Any cleanup and/or disposal plan may be submitted

Depends on EPA finding of no unreasonable risk of injury to health or env

*PCB Remediation Waste resulting from a spill or release before 1978 is not subject to the cleanup requirements of the regulations (unless the RA makes a finding of unacceptable risk) but is subject to the disposal requirements if it is picked up (see 40 CFR 761.50(b)(3)).

Some Things to Remember

- ***How you sample matters- "As found" refers to in-situ concentrations or to stockpiles if the waste was already in place at the time of site investigation or characterization.***
- ***For example, you may not dilute the as-found concentration of the contaminated soil during excavation or other management activities. Soils must not be disturbed outside of sampling or diluted (e.g., excavated, placed on a pile, and sampled afterwards) before conducting in-situ characterization sampling.***

- ***How you analyze the samples matters- 40 CFR Part 761, Subpart N and O, PCB Extraction and Analytical Methods***
- ***The PCB regulations require the use of the Ultrasonic (EPA SW 846 Method 3550C) or Soxhlet (EPA SW-846 Method 3540C) extraction methods (preparation method). (EPA recommends the use of the Soxhlet extraction procedure because of the poor sample extraction efficiency of the ultrasonic method and States may not approve of M3550C.)***

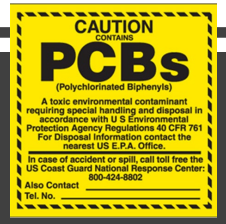
Use Method 8082 for analysis.

Spill Cleanup Policy

- Subpart G of PCB regulations; however, it is a “policy”
- Intended for spills <72 hours old
- No need to notify EPA; however, need to keep a report

PCB Remediation Waste Self-Implementing Cleanup and Disposal

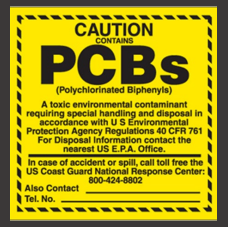
§761.61(a)(1)



Applicability-

- May **not** be used to clean up:
  - Surface or Groundwater
  - Sediments in surface water or groundwater ecosystems
  - Sewers or sewage treatment systems
  - Any private or public drinking water sources or distribution systems
  - Grazing lands
  - Vegetable gardens

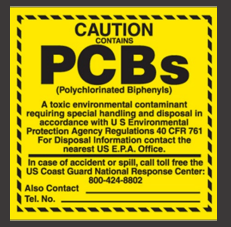
PCB Remediation Waste
SELF-IMPLEMENTING CLEANUP AND DISPOSAL
§ 761.61(a)(2)



Site Characterization- References Subpart N and Subpart O

- Requires *Sampling Bulk PCB Remediation Waste and Porous Surfaces*- a grid interval of 3 meters **and** the procedures in Sections 761.283 (number of samples) and 761.286 (sample size and procedure) for PCB remediation wastes.
- Subpart O requirements for disposal as <50 ppm.
- Compositing cannot be used for characterization but can be used for verification.

PCB Remediation Waste
SELF-IMPLEMENTING CLEANUP AND DISPOSAL
§ 761.61(a)(2)



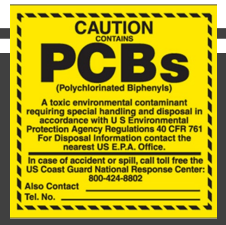
Site Characterization- References
Subpart N and Subpart O

There are very specific site characterization sampling. If the characterization deviates in any way from the regulations, the self-implementing cleanup and disposal option is not applicable…

However, a "hybrid Approval" may be issued by EPA to allow an alternate sampling characterization.

PCB Remediation Waste Self-Implementing Cleanup and Disposal

§761.61(a)(2)



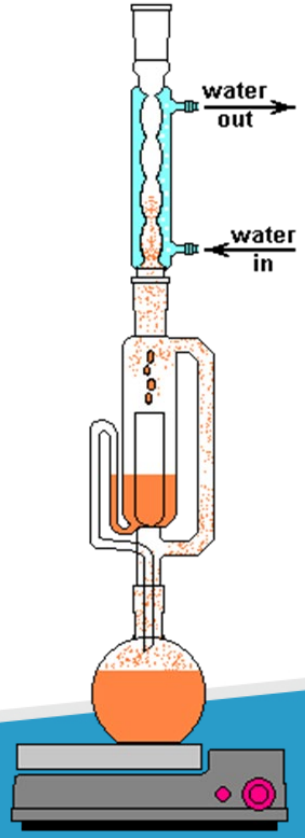
Site Characterization- Continued

- *761.272-Chemical extraction and analysis of samples*

There are very specific methods for extraction and chemical analysis. If the methods used deviate in any way from the regulatory requirements, sampling may have to be repeated. EPA may require further sampling with the appropriate methods.

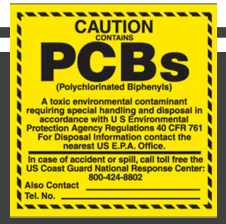
(EPA prefers extraction method 3540.)

Deviation from the extraction methods must be done through Subpart Q.



PCB Remediation Waste Self-Implementing Cleanup and Disposal

§761.61(a)(3)



Notification and Certification

Regulation requires notification 30 days prior to the date that the **cleanup of a site begins**.

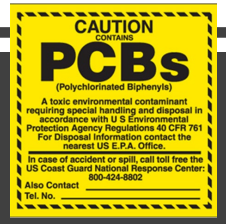
However:

- ***The property owner is responsible for making sure that EPA receives the notification.***
- ***If there are comments within the 30 days or issues with the plan, you can not proceed after the 30-days has passed.***
- ***The plan may proceed after 30 days without EPA approval…however, if any aspect of the 761.61(a) requirements are not followed, the 30 day default provision does not apply.***

THE FAILURE OF EPA TO RESPOND IN 30 DAYS IN NOT IMPLIED/IMPLICIT APPROVAL.

PCB Remediation Waste Self-Implementing Cleanup and Disposal

§761.61(a)(3)



Notification and Certification

(Required elements for .61(a))

- Pre-Cleanup Site Characterization
- PCB Cleanup Plan
- Written Certification

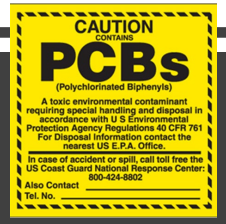
EPA can provide a checklist to assist in the development of the Notification.

EPA has developed a PCB Facility Approval Streamlining Toolbox (PCB FAST).

https://www.epa.gov/pcbs/pcb-facility-approval-streamlining-toolbox-fast-streamlining-cleanup-approval-process

PCB Remediation Waste Self-Implementing Cleanup and Disposal

§761.61(a)(3)



Notification and Certification

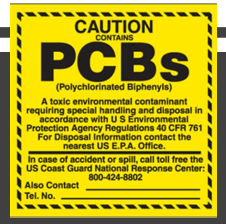
(Required elements for Both 61(a) and 61(c))

Pre-Cleanup Site Characterization (completed or proposed)-

- The horizontal and vertical extent of the contamination must be delineated to **less than 1 mg/kg PCBs**. For 761.61(c), the standard could be lower.
- EPA does not distinguish between saturated and unsaturated soils.
- Groundwater samples should be collected from wells close to where PCBs exceed the soil cleanup target level. Groundwater should be analyzed using Method 8260 to determine volatile organic compounds; including but not limited to, Chlorobenzenes, Tetrachloroethylene (PCE), and Trichloroethylene (TCE).
- In the event there is a line of evidence that indicates a solvent carrier of PCB was part of the discharge, delineation of PCBs in soil below the water table may be required to determine if a source below the water table is present on top of the confining layer.

PCB Remediation Waste Self-Implementing Cleanup and Disposal

§761.61(a)(3)



Notification and Certification

(Required elements for Both 61(a) and 61(c))

Pre-Cleanup Site Characterization (completed or proposed)-

- Summary of the procedures used to sample contaminated and adjacent areas.
- A table and/or cleanup site map showing PCB concentrations measured in all pre-cleanup characterization samples.
- Copies of the laboratory analytical reports of the characterization sampling, including field and laboratory quality assurance/quality control samples should be provided with the notification to EPA 761.61(a)(3)(i)(C).
- The location and extent of the identified contaminated area-pictures and maps with sample collection sites cross referenced to the sample identification numbers in the data summary from paragraph (a)(3)(i)(B) of this section. (40 CFR 761.61(a)(3)(i)(C))

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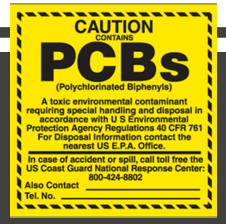
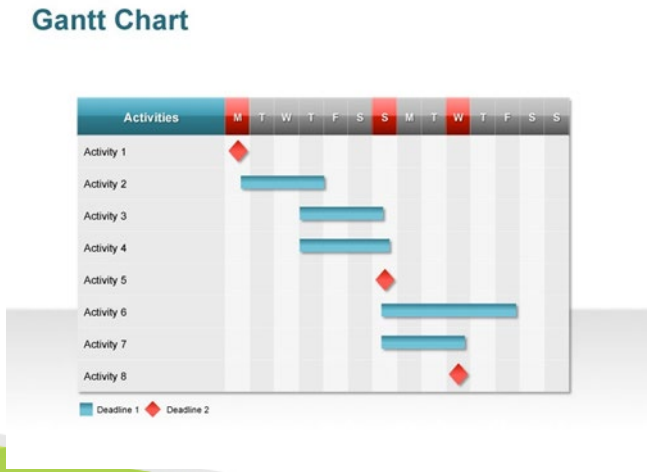
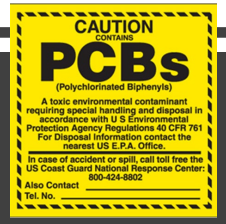


Notification and Certification

(Required elements for Both 61(a) and 61(c))

- PCB Cleanup Plan- includes a schedule, disposal technology, and approach. This plan should contain options and contingencies to be used if unanticipated higher concentrations or wider distributions of PCB remediation waste are found or other obstacles force changes in the cleanup approach.





PCB Remediation Waste Self-Implementing Cleanup and Disposal

§761.61(a)(3)

CLEANUP REQUIREMENTS

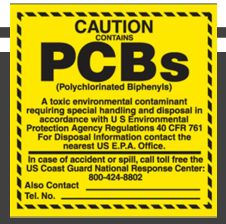
For BULK PCB REMEDIATION WASTE and POROUS SURFACES

High Occupancy	Low Occupancy
Definition* ≥ 6.7 hrs/wk without dermal or respiratory protection **Cleanup Standards** ≤ 1ppm in residual waste or porous surface w/o further conditions > 1 to ≤ 10 ppm if site covered w/ compliant cap and institutional control implemented (deed restriction)	**Definition*** < 6.7 hrs/wk without dermal or respiratory protection **Cleanup Standards** ≤25 ppm in residual waste or porous surface, unless otherwise specified in 40 CFR 761.61(a)(4)(i)(B) & institutional control implemented (deed restriction) >25 ppm to ≤50 ppm if secured by fence, marked per 40 CFR 761.45 & institutional control implemented (deed restriction) > 25 ppm to ≤100 ppm w/ appropriate cap & institutional control implemented (deed restriction)

* See 40 CFR 761.3 for the complete definition

PCB Remediation Waste Self-Implementing Cleanup and Disposal

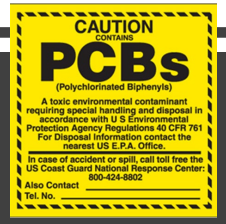
§761.61(a)(3)



- **Written Certification-** as defined in §761.3 **and** certifying that all sampling plans, sample collection procedures, sample preparation procedures, extraction procedures, and instrumental/chemical analysis procedures used to assess or characterize the PCB contamination at the cleanup site are on file at the location designated in the certificate and are available for EPA inspection.

  The Certification required in 40 CFR 761.61(a)(3)(i)(E) **must** be signed by the site owner. The Certification is part of the Notification.

PCB Disposal Options

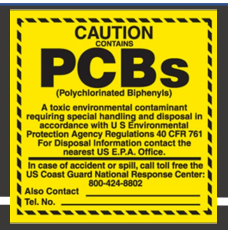


The general, most conservative disposal options are a TSCA-approved landfill (for non-liquids) or a TSCA-approved incinerator (for liquids).

Other disposal options are available depending on the media, concentration, and the cleanup option.

Depending on remedial option selected, the disposal options may be limited.

PCB- Things to Remember…



- PCBs are regulated by the U.S. EPA under the Toxic Substances Control Act
- A few key points:
  - When identified, appropriate management and disposal of materials containing PCBs is required under TSCA regulations.
  - Regulations prohibit the use of PCBs at greater than 50 ppm in caulk and other non-liquid products, including continued use of products already in place.
  - If PCBs greater than 1 ppm remain onsite there are other requirements (**e.g., deed restrictions, monitoring and maintenance plans, financial assurance**).
  - PCB regulations may govern owners, operators, and/or persons conducting cleanup of PCB-contaminated property where the PCB contamination exceeds allowable concentrations under the regulations.
  - TSCA authority is not delegated to the states; therefore, both TSCA and state regulations will apply.

Is TSCA applicable at Brownfield sites?

Yes, for those sites where cleanup of PCB remediation waste is required.

Is TSCA applicable at RCRA Corrective Action sites?

Yes, for those sites where cleanup of PCB remediation waste is required.

Is TSCA applicable at Superfund sites?

Yes, for those sites where cleanup of PCB remediation waste is required.

Other Questions Answered…

Key Advice

- Contact your EPA Regional PCB Coordinator early – as soon as you think you might have or know you have PCBs on your cleanup site.

- Why?

The PCB regulations require a distinct process that often requires EPA notification/approval, ***and delays*** are likely if EPA is not involved early. EPA's interest is to make sure that the requirements of the federal PCB regulations are met while trying to avoid duplication of documentation and effort.

SELF-IMPLEMENTING CLEANUP AND DISPOSAL

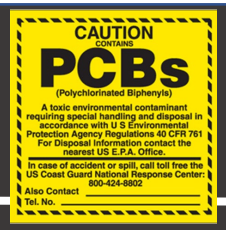
(§ 761.61(a)) is not always the best option or an available option. It has very prescriptive sampling cleanup and disposal requirements. It is meant for small sites (<1 acre).

Make sure to use the appropriate PCB sample extraction and chemical analysis methods.

Contact the Regional PCB Coordinator early in the project if PCBs are found.

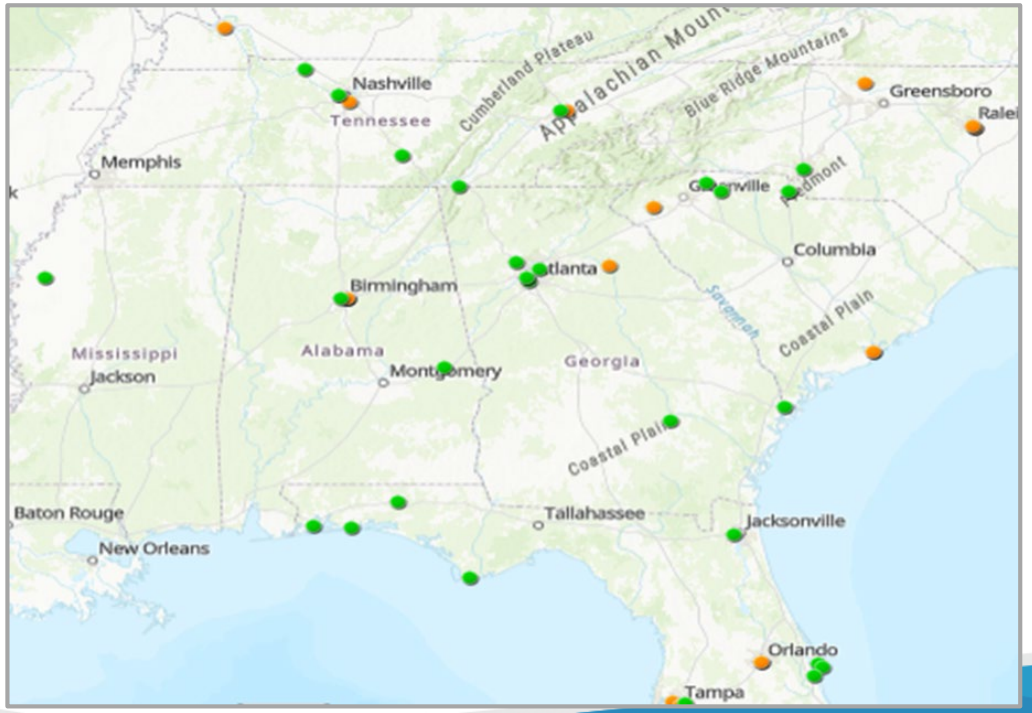
Three Take-Away Points to Remember

Resources



- Region 4 PCB Website
  https://www.epa.gov/pcbs/epa-region-4-polychlorinated-biphenyls-pcbs

- Region 4 Interactive Map of Cleanup Sites
  https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=6ef48abc71e744b4b07a5635f77dfea9



Resources

- **Comprehensive Q & A Manual**
  Commonly asked questions on all manner of topics

  https://www.epa.gov/pcbs/polychlorinated-biphenyl-pcb-question-and-answer-manual-and-response-comment-documents

- **Sampling Guidance**
  How to sample natural gas pipeline, apply a grid sampling plan, do wipe sampling, etc.

  https://www.epa.gov/pcbs/guidance-sampling-certain-types-wastes-containing-polychlorinated-biphenyls-pcbs

- **Checklists for 61(a) and 61(c) cleanup applications**
  Excellent resource for those submitting cleanup plan

  https://www.epa.gov/pcbs/managing-remediation-waste-polychlorinated-biphenyls-pcbs-cleanups

A more complete list of PCB guidance can be found at the EPA website.

https://www.epa.gov/pcbs

HOW YOU SAMPLE MATTERS

The cleanup rules are based on "as-found" concentrations of PCBs. **That means samples must be collected before the material is disturbed.** Stockpiles may be sampled if they were already in place at the time of site investigation or characterization.

REQUIREMENTS FOR THE SELF-IMPLEMENTING CLEANUP OPTION

There are very specific requirements for site characterization sampling:

- 3-meter sampling grid
- Sample size and procedure (§761.286)
- Specific laboratory methods (extraction methods) (Part 761, Subparts N and O)
- Number of samples (§761.283)

Any deviation from the procedures of self-implementing cleanup under 761.61(a) requires approval from EPA under 761.61(c). If the characterization deviates from the regulations, the self-implementing cleanup and disposal option is not applicable

QUESTIONS? CALL THE EPA.

Call the EPA for questions prior to conducting assessments that may involve PCB remediation waste.

Contact your EPA Regional PCB Coordinator early – as soon as you think you might have or know you have PCBs on your site. You can find contact information for your EPA Regional PCB Coordinator at:

www.epa.gov/pcbs/program-contacts

FOR MORE INFORMATION

Visit the following websites:

https://www.epa.gov/pcbs

PCB Facility Approval Streamlining Toolbox (PCB FAST)

https://www.epa.gov/pcbs/pcb-facility-approval-streamlining-toolbox-fast-streamlining-cleanup-approval-process

EPA provides checklists to help with the notification (for self-implementing cleanups) and the cleanup application (for risk-based cleanups).

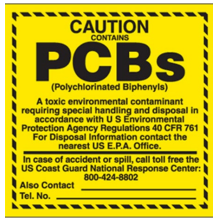
Polychlorinated Biphenyls (PCBs)

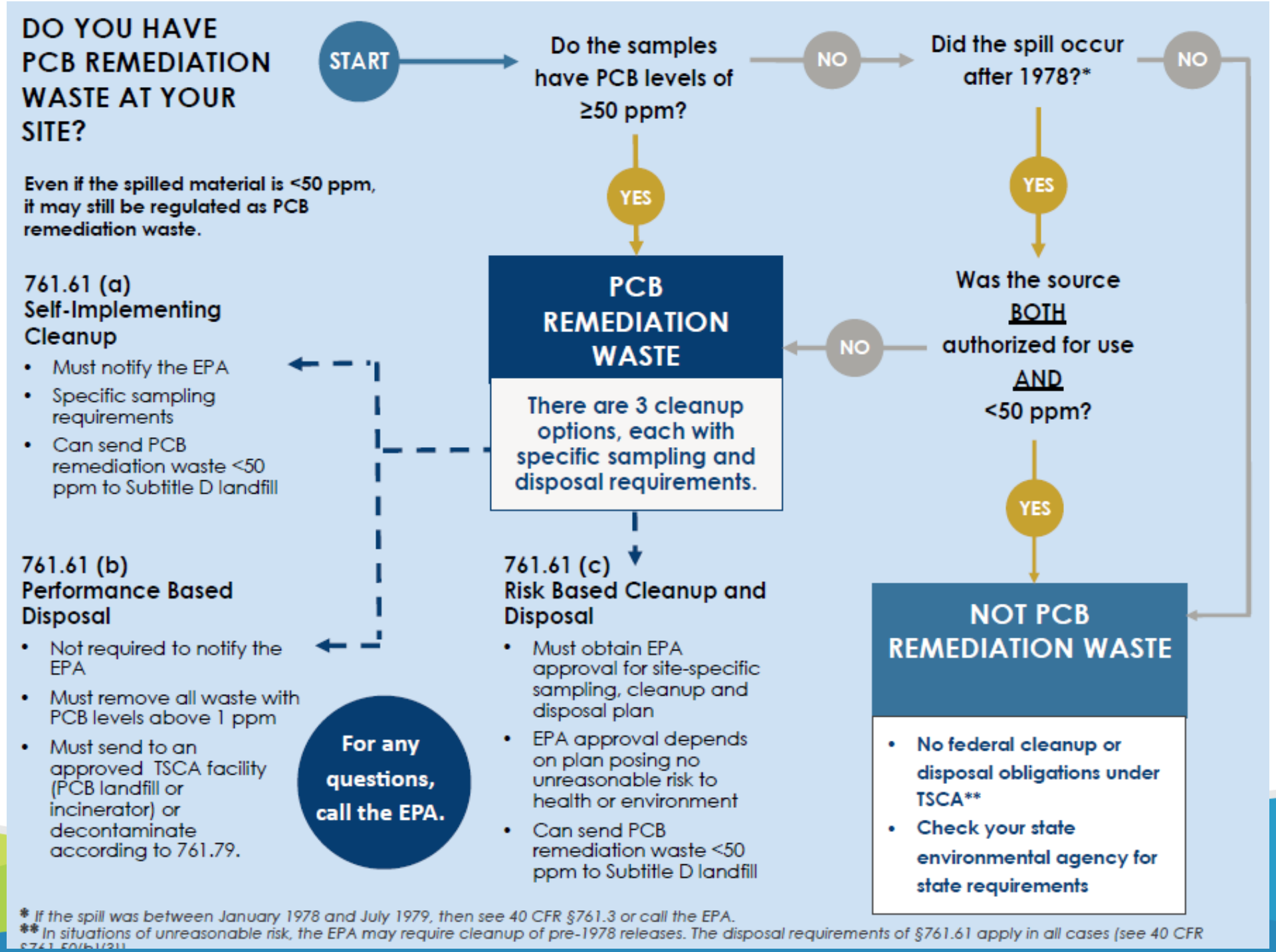
GUIDE FOR ENVIRONMENTAL PROFESSIONALS

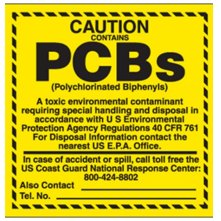
EPA United States Environmental Protection Agency

December 2019

(This is a generalized depiction, see 40 CFR Part 761 for full detail.)




DO YOU HAVE PCB REMEDIATION WASTE AT YOUR SITE?
START
Do the samples have PCB levels of ≥50 ppm?
NO
Did the spill occur after 1978?*
NO
YES
YES
Even if the spilled material is <50 ppm, it may still be regulated as PCB remediation waste.
PCB REMEDIATION WASTE
There are 3 cleanup options, each with specific sampling and disposal requirements.
NO
Was the source BOTH authorized for use AND <50 ppm?
YES
761.61 (a) Self-Implementing Cleanup
• Must notify the EPA
• Specific sampling requirements
• Can send PCB remediation waste <50 ppm to Subtitle D landfill
761.61 (b) Performance Based Disposal
• Not required to notify the EPA
• Must remove all waste with PCB levels above 1 ppm
• Must send to an approved TSCA facility (PCB landfill or incinerator) or decontaminate according to 761.79.
For any questions, call the EPA.
761.61 (c) Risk Based Cleanup and Disposal
• Must obtain EPA approval for site-specific sampling, cleanup and disposal plan
• EPA approval depends on plan posing no unreasonable risk to health or environment
• Can send PCB remediation waste <50 ppm to Subtitle D landfill
NOT PCB REMEDIATION WASTE
• No federal cleanup or disposal obligations under TSCA**
• Check your state environmental agency for state requirements
* If the spill was between January 1978 and July 1979, then see 40 CFR §761.3 or call the EPA.
** In situations of unreasonable risk, the EPA may require cleanup of pre-1978 releases. The disposal requirements of §761.61 apply in all cases (see 40 CFR


CAUTION
CONTAINS
PCBs
(Polychlorinated Biphenyls)
A toxic environmental contaminant requiring special handling and disposal in accordance with U S Environmental Protection Agency Regulations 40 CFR 761
For Disposal Information contact the nearest US E.P.A. Office.
In case of accident or spill, call toll free the US Coast Guard National Response Center: 800-424-8802
Also Contact
Tel. No.

http://www.cma.army.mil/include/docrendition.asp?DocID=003675338

http://www.niuhidivecharters.com/oriskany-dive.html

Whiting-Turner Community Outreach Flyer

https://www.arnold.af.mil/

https://www.nasa.gov/content/launch-pad-39b

Case Study
Milton Avenue
(Atlanta, Georgia)

Milton Avenue (Atlanta, Georgia)

Site Overview:

- Entire project covers ~12 acres.
- Located along the Atlanta Beltline.

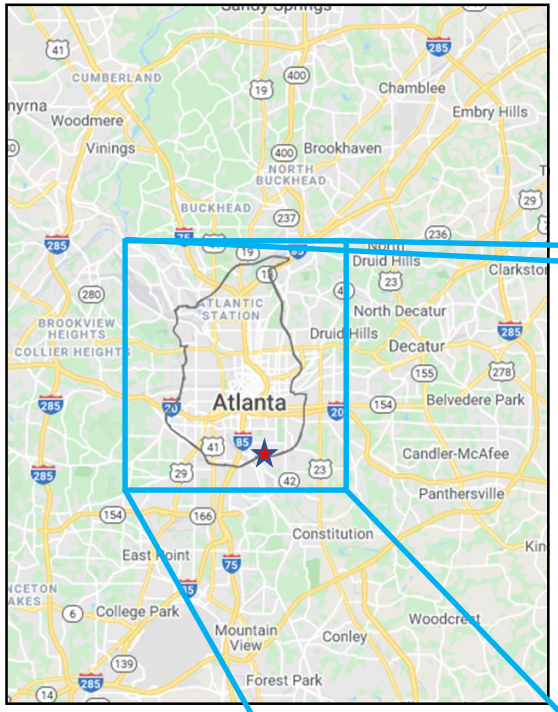
Historical Use:

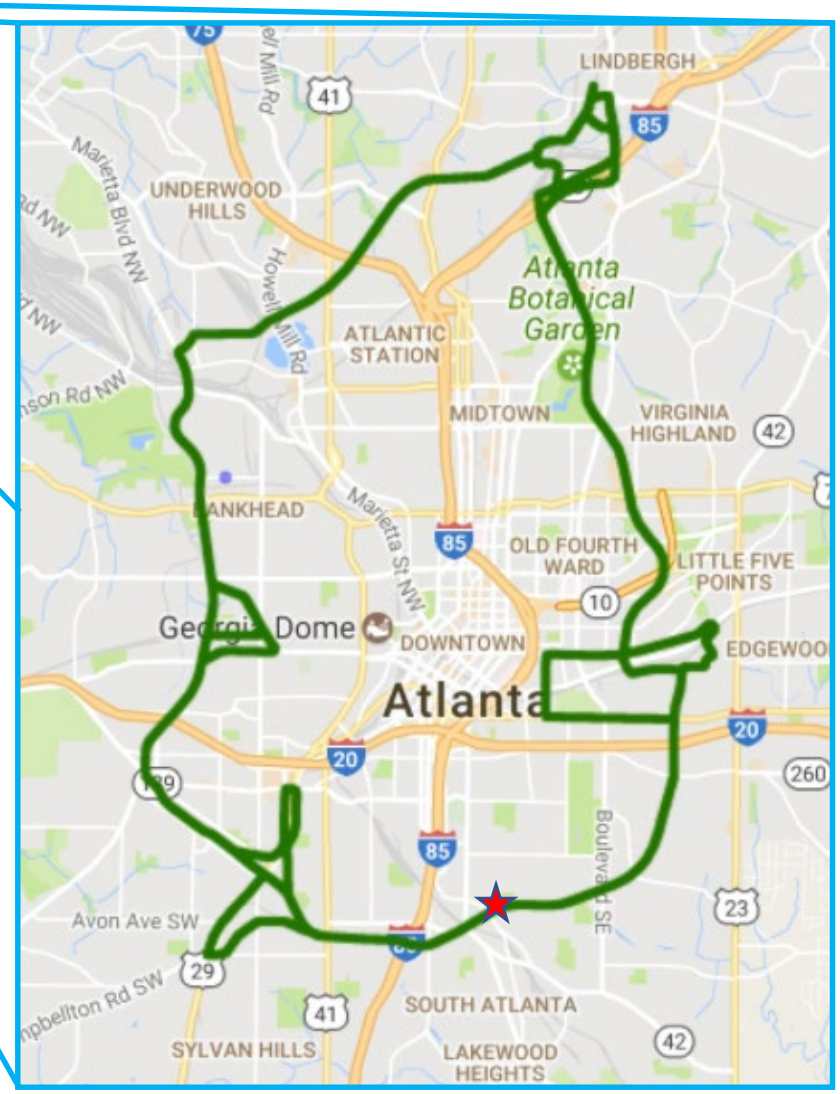
- Cottonseed oil business (1920s – 1960s).
- Metal recycling facility (1960s – 1990s).
- Abandoned since 1990s, until recent development.

Future Use:

- Multi-family residential complex.

Milton Avenue Site on the Atlanta Beltline



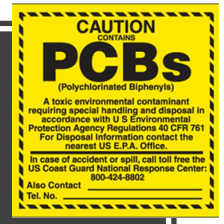


Milton Avenue Parcel 80 (Atlanta, Georgia)

Summary of Parcel 80, Milton Avenue Complex:

- Approximately 1.3 acres.
- Multiple rounds of soil sampling, including vapor intrusion sampling.
- PCBs detected in soils intermittently across the site >1 ppm.
- PCBs reported <0.91 µg/m³ during vapor sampling.
- PCBs remain on-site > 1 ppm.

Milton Avenue Parcel 80 (Atlanta, Georgia)



Requirements/Conditions of PCB Cleanup:

- **Cap**: Placement of a cap atop soil in areas of PCB soil contamination.
- **Vapor Barrier and Mitigation System**: Installation of vapor barriers and vapor intrusion mitigation systems between cap and structures.
- **Monitoring and Maintenance Plan:** Submitted and reviewed by EPA to ensure proper working order of caps, vapor barriers and vapor mitigation system.
- **Deed Restrictions:** Notation on the deed that notifies any potential purchaser of PCB contamination and associated caps, etc.
- **Financial Assurance:** At a minimum, cost estimates are required to include costs of monitoring and maintenance.

Coordinated Approval
40 CFR § 761.77

News

- *EPA and FDEP have a PCB Memorandum of Agreement (MOA).*
- *This is the first PCB MOA in Region 4.*
- *MOA specifies that FDEP will be pursuing the PCB Cleanup and will consult with EPA.*
- *MOA does not apply in all situations. Class of application is designated.*

R4 PCB Team

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Jan Martin

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US EPA Region 4

Land, Chemicals and Redevelopment Division

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