

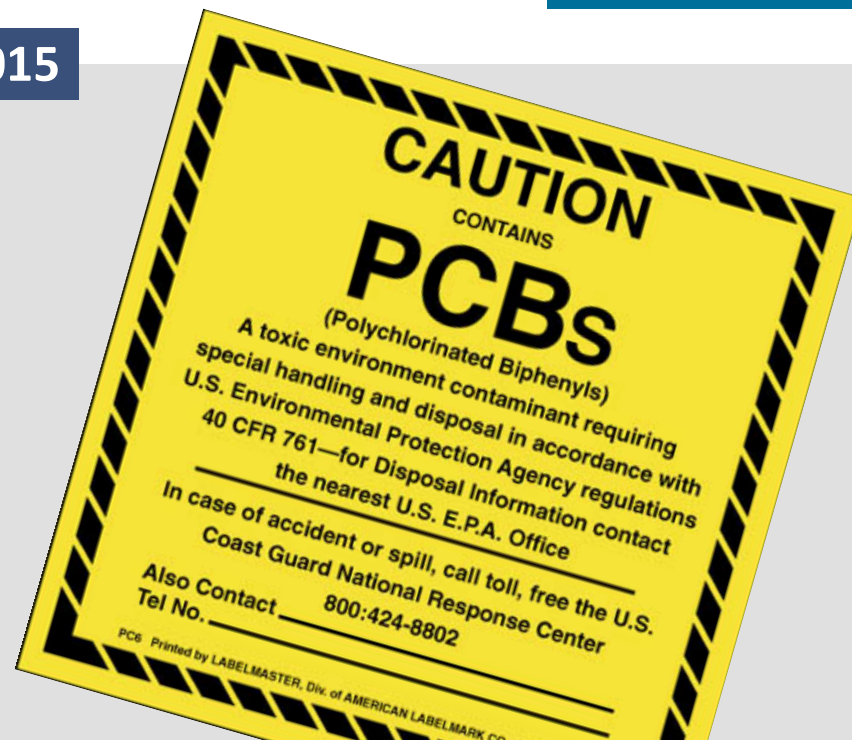
Managing PCB-Containing Construction Materials

An Overview & Case Study

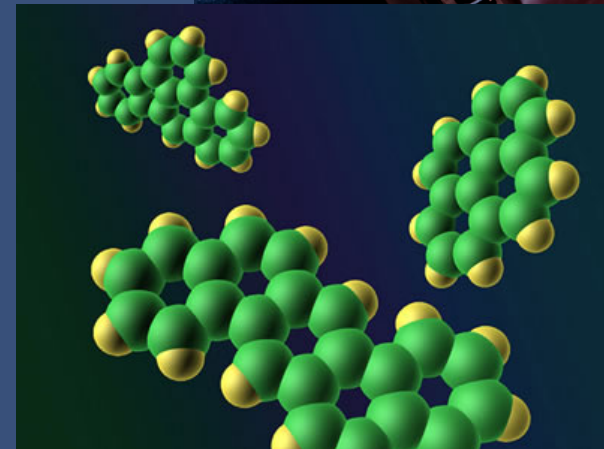
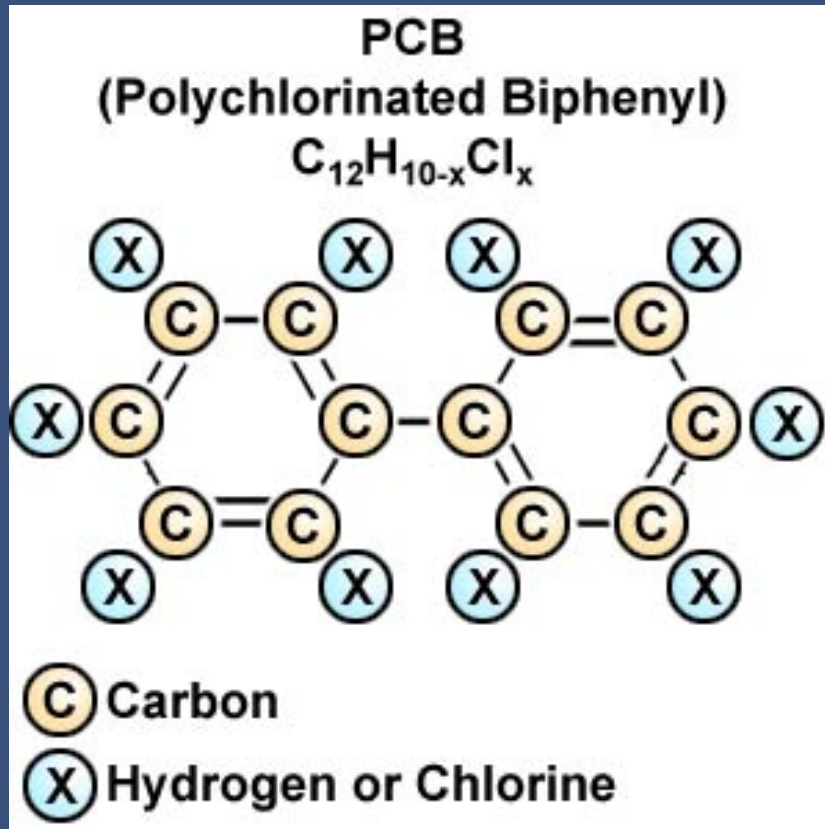
Presented to: Georgia Local Section of:



April 22, 2015



PCB – A Closer Look



PCB's Historic Milestones

- First PCB-like chemical discovered in 1865 – a coal tar by-product
- Manufactured 1927 -1978 (Anniston Ordinance Company/ Swann Chemical Company/ Monsanto)
- Manufactured in Anniston, AL & Sauget, IL from 1927- 1977
- 1979- U.S. Import Ban on PCB's Enacted
- 1983- Times Beach, MO
- Some Manufacturing Process Inadvertently Generate PCBs (*chlorinated solvents, paints, printing inks, plastics*)
- 2009 – EPA's Issue Schools and Buildings PCB Guidance Document
- 2012 – EPA Issues Reinterpretation Letter

PCB Brands



Arochlor – Monsanto, US



Kanechlor, Santotherm –
Kanegafuchi, Mitsubishi, Japan

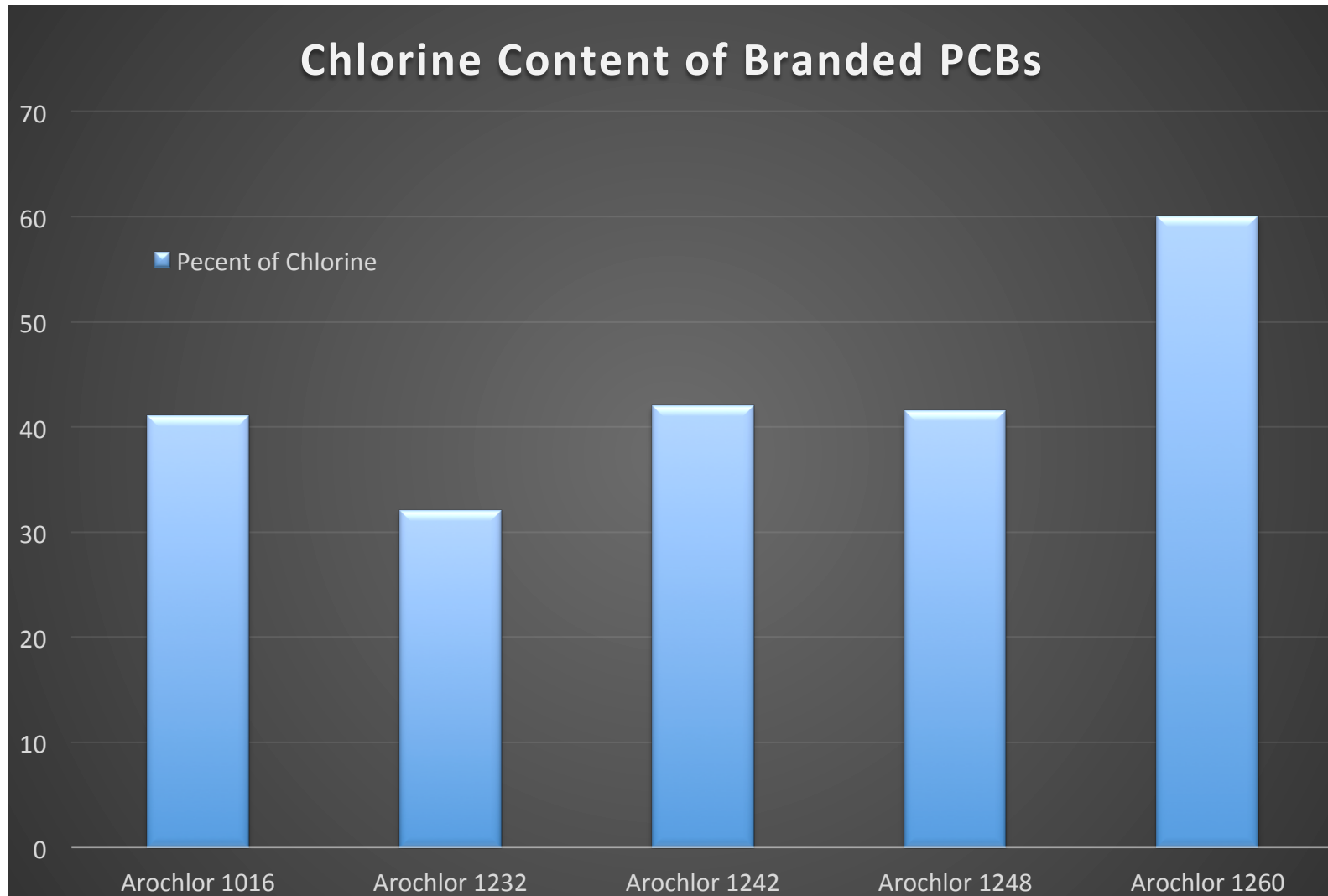


Chlorphen – Bayer, Germany



Phenochlor & Pyralene –
Prodolec, France

Chlorine Content of Common Brands



PCB's Many Uses

- Closed System & Heat Transfer (Transformers, capacitors, fluorescent lighting, ballasts, etc.)- 60%
- Plasticizers- 25%
- Hydraulic Fluids & Lubricants- 10%
- Miscellaneous Uses- 5%

• Sources: ASTDR (2000); EIP Associates (1997)



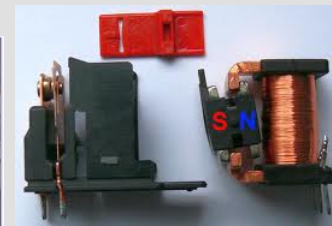
PCBs Many Uses (cont'd.)

- Capacitors
- Switch-Gear
- Ballasts
- Hydraulic Fluids/Lubricants
- Plasticizers (Automotive, toys, etc.)
- Lighting
- Dielectric Fluids

- Transformers
- Galbestos
- Paints (*Marine, Industrial, Aerospace*)
- Caulking
- Paper Bleaching
- Liquid-Filled Cables
- Electromagnets
- Fiberglass Insulation Adhesives



PCB-containing Ballast



PCB Applications

- Dust Control
- Pesticides
- Fire Retardants
- Carbonless Paper
- Inks
- Wood Treatment
- Building Materials



• Sources: ASTDR (2000); EIP Associates (1997)

PCB in Everyday Life

WHERE CORROSION GNAWS AND CLIMATE IS GRUELING
ROOF AND SIDES OF

Galbestos

Galbestos is a unique material... H. H. ROBERTSON CO.



SO THE TORNADO BECAME A WHIRLWIND SALESMAN

FOR

Galbestos

forms have lashed across southern airports and left hangars made of Robertson Protected Metal standing unscathed among wreckage. His evidence has spoken more eloquently than any of our advertisement so, for the latest development in protected metal from Robertson Research Laboratories—Galbestos. Although Galbestos was widely used for roofs and sides of large buildings before the war, some extreme applications during the last few years have proved that Galbestos can resist weather, heat and corrosion as no protected metal ever has before.

Galbestos is unique among protected metals for its workability

on ordinary sheet metal shop equipment. But it is even more remarkable for its durability. It is lightweight, yet so strong that it stands up under strain which might be considered impossible, were it not that we have the facts to prove it.

Architecturally, Galbestos opens up new opportunities for designers. It has color, flexibility and capacity for contrasting textures. Call a Robertson representative or write for literature to:

H · H · ROBERTSON

2407 Farmers Bank Building
Pittsburgh 22, Pennsylvania



THE DUTCH BOYS' LEAD PARTY

A Paint Book for Girls and Boys

With which is bound COLOR HARMONY IN THE HOME
A Booklet for the Grown-ups



Lock your fingers like this picture. It will give you an idea of how asbestos fibers are locked into the very core metal of Galbestos. We call this bond the Galbestos Grip. It is a unique development of Robertson research.



Asbestos is fused to sheet steel by a metallic alloy. The myriad rock-born fibers are literally imbedded in metal. The asbestos is impregnated with asphalt and waterproofed.

So inseparable is the bond that Galbestos can be worked on ordinary sheet metal shop equipment. By worked we mean crimped, rolled, sheared, bent and riveted like unprotected metal.

Galbestos comes in standard siding sheets up to 12 feet by masonry, aluminum or black flat or in several corrugations over structural framework. We like to see samples!

TESTED AND APPROVED BY THE ASSOCIATED FACTORY MUTUAL FIRE INS. CO., BOSTON, AND THE UNDERWRITERS' LABORATORIES, INC., CHICAGO

PREWAR TESTED FOR POSTWAR CONSTRUCTION



Robertson

AND FLAME AND FURY... Galbestos

ROOF DECK

H. H. Robertson Company, Pittsburgh, Pennsylvania

PCBs in Caulk

Benefits & Use

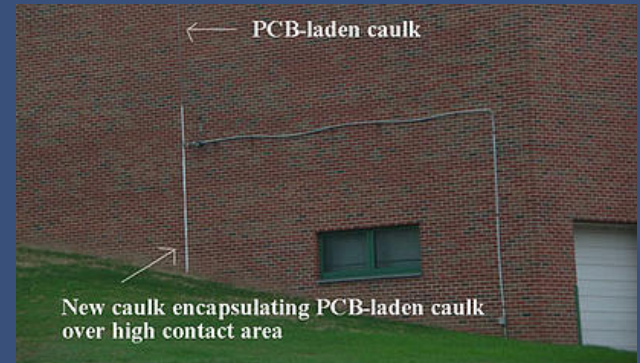
- **Caulk:-** a natural or synthetic material used to seal gaps at materials interfaces and/or joints, usually around envelope penetrations
- Usually Aroclor 1254, 5-10 %
- PCB's allowed pliability & durability
- Longer lifecycle use
- Commonly Used 1950's – 1970's



PCBs in Caulk

Exposure Concerns

- **Erosion w/ Age** – can release into environs
 - Soil, Water & Air
 - Food-chain Uptake
 - Direct Human Contact
 - Dust in confined work, home & learning environments



PCBs in Paint (Benefits and Uses)

Added as a Plasticizer Ranging (Between 5 – 30 % PCB)

Enhanced Structural Integrity & Increased Adhesion

Increased Anti-fungal Properties

Durability, Luster & Longevity

Corrosion and Heat and Furnace Resistance

Chemical Resistance Coatings

Masonry Paints (Swimming Pools)

Traffic Paints

Aerospace & Marine Applications

Tank & Railway Gondola Cars

PCB 11?

Decorative Structures & Bridges



PCBs in Paint

Exposure Concerns

- **Erosion w/ Age** – can release in environs
 - Soil, Water & Air
 - Food-chain Uptake
 - Direct Human Contact
 - Dust in confined work, home & learning environments (Sanding & Grinding Common Issues).
 - Easy Pathway to Waterways from Aging Infrastructure (Bridges & Road Systems)





NEW PAINT INGREDIENT
 solves difficult problem for
WORLD OF TOMORROW

There's a paint story in the New York World's Fair that has startled architects, builders, painters, and decorators.

Upset are old ideas that no paint can withstand the chemical action of water and the alkalis in concrete, stucco, and other cement surfaces. Paint made with *Parlon* as a base does withstand this action. For spectacular proof, see the acres of murals, walls, and basins for fountains and lagoons at the Fair.

Parlon is chlorinated rubber that Hercules research has improved in so many ways that it actually has become a revolu-

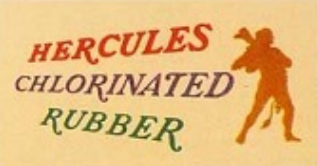
tionary paint ingredient. It makes possible paints that resist acids as well as alkalis.

Added to other types of finishes, including synthetics, it speeds drying; gives a tougher, more elastic film. It is also used in printing inks, textile coatings, and adhesives; is rapidly being adopted for many more applications.

We ourselves make no paints, but produce the ingredient, *Parlon*, for expert paint manufacturers. Write for their names; or for information about *Parlon* for other uses.



THE TRYLON AND PERISPHERE, and all concrete or stucco buildings, basins, and lagoons constructed by the Fair management, were painted, after competitive tests, with *Parlon* base finishes. Their ability to withstand the chemical action of alkalis and water has been clearly demonstrated on the buildings of private exhibitors also.



Cellulose Products Department
HERCULES POWDER COMPANY
 Incorporated
 WILMINGTON, DELAWARE

© 1939-40
 CELLULOSE ACETATE... NITROCELLULOSE... ETHYL CELLULOSE... CHLORINATED RUBBER

*“Paint made with **Parlon** as a base does withstand this (wear caused by water and alkalis in building materials) action. For spectacular proof...”*

*“**Parlon** is chlorinated rubber that Hercules research has improved in so many ways that it actually has become a revolutionary paint ingredient.”*

How Many Have Dealt with PCBs or PCBs in Building Materials?



PCB Regulations



Toxic Substance Control Act 40 CFR (sub) 761



Subpart A – General
(applicability)

Subpart B- Manufacturing,
Processing, Distribution & Use

Subpart C -Marking of PCBs &
PCB Items

Subpart D - Storage & Disposal

Subpart E- Exceptions

Subpart F- Transboundary
Shipments for Disposal

-Subpart G- PCB Spill Cleanup
Policy

PCB Regulations



Toxic Substance Control Act 40 CFR (sub) 761

Subpart J – General Records, Reports

Subpart K – Waste Disposal Records and Reports

Subpart M – Determining Concentrations and Sampling

Subpart N – Cleanup Characterization Sampling

Subpart O – Sampling to Verify in Accordance with 761.61

Subpart P – Sampling Non-Porous Surfaces, Measurement



PCB Regulations



Toxic Substance Control Act 40 CFR (sub) 761

Subpart Q – Self-Implementing Alternative Extraction and Chemical Analysis

Subpart R – Sampling Non-Liquid & -Metal Bulk, Accordance 761.62 & Offsite Disposal 761.61

Subpart S – Double Wash/Rinse Method for Decontaminating Non-Porous Surfaces

Subpart T – Comparison Study for Validating a New Performance-Based Decontamination Solvent Under 761.79(d)(4)



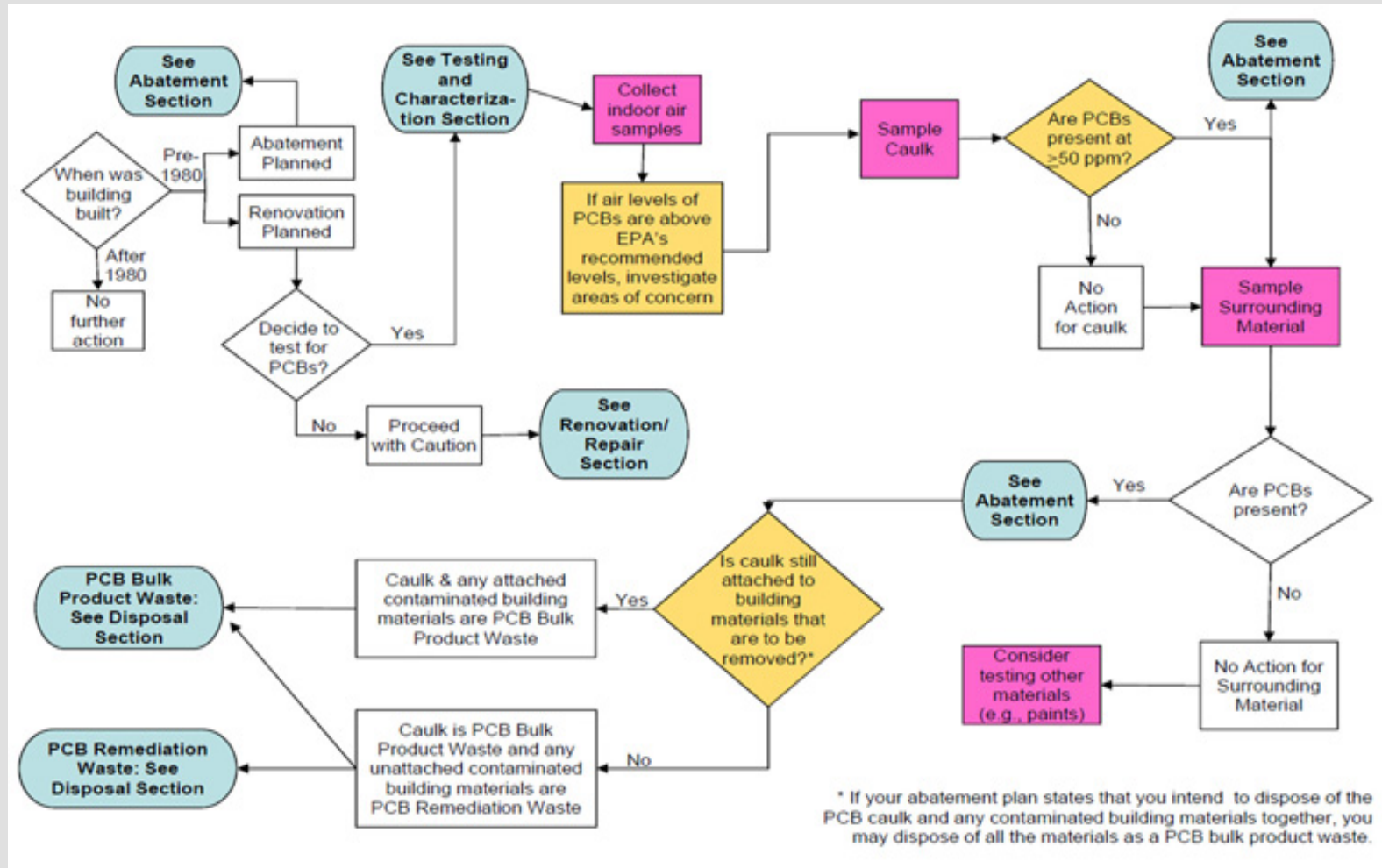
You May Have PCB Containing Material – “Now What?”

Assessment

Testing of
Suspect
Materials

- Paint
- Caulking
- Gaskets
- Delineation of Work Areas
- Sampling of Caulking products and substrates

You May Have PCB Containing Material – “Now What?”



Removal Plan

- USEPA Notification
 - ✓ Pre-work Notification
 - ✓ Post-work
- Operations Plan
 - ✓ Paint
 - ✓ Caulking
- Materials Management Plan
 - ✓ Waste Removal
 - ✓ Operations



Removal Plan

➤ Worker Health & Safety Plan

- ✓ PPE
- ✓ HAZWOPER 1910.120
- ✓ Dust Control
- ✓ Personal/Perimeter Monitoring?

➤ Sampling Plan

- ✓ Verification



Removal Plan

Waste Management / Disposal Plan

- ✓ Packaging & Labeling
- ✓ Manifesting
- ✓ Disposal
 - Subtitle D SWL
 - Subtitle C SWL
 - Incineration



Disposal

WASTE TYPES

Defined
in 40 CFR
761.3

- PCB Bulk Product Waste
- PCB Remediation Waste

Disposal (Cont'd.)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
RESOURCE CONSERVATION
AND RECOVERY

OCT 24 2012

MEMORANDUM

SUBJECT: PCB Bulk Product Waste Reinterpretation

TO: Regional TSCA and RCRA Division Directors, EPA Regions 1-10

FROM: Suzanne Rudzinski, Director *Suzanne Rudzinski*
Office of Resource Conservation and Recovery

On February 29, 2012, EPA published in the *Federal Register* a draft reinterpretation of our position regarding PCB-contaminated building materials, specifically addressing the definition of PCB bulk product waste and PCB remediation waste. Based on comments received, we have modified the proposed reinterpretation to improve the ability to implement the reinterpretation. Today, we are announcing that we are finalizing the reinterpretation, which allows building material "coated or serviced" with PCB bulk product waste (e.g., caulk, paint, mastics, sealants) at the time of designation for disposal to be managed as a PCB bulk product waste.

Background

EPA has received several questions from the regulated community regarding the disposal and cleanup requirements for PCB-contaminated building materials. The Toxic Substances Control Act (TSCA) regulations at 40 CFR 761 provide disposal and cleanup requirements for PCBs. The disposal and cleanup requirements for PCB-contaminated building material depend on whether the material is classified as a PCB bulk product waste or PCB remediation waste. Waste derived from caulk or paint containing PCBs at ≥ 50 parts per million (ppm) is defined as PCB bulk product waste in 40 CFR 761.3. The definition of PCB bulk product waste includes "non-liquid bulk wastes or debris from the demolition of buildings and other man-made structures manufactured, coated, or serviced with PCBs." Other PCB bulk product wastes may include, but are not limited to, mastics, sealants, or adhesives containing PCBs at ≥ 50 ppm. PCB remediation waste is defined as "waste containing PCBs as a result of a spill, release, or other unauthorized disposal...", and leaching may be considered a release of PCBs.

Summary

In February 2012, the Agency solicited comment on a draft reinterpretation of its position regarding the status of PCB-contaminated building materials under the definition of PCB bulk product waste. In association with the proposed reinterpretation, EPA identified several guidance documents that would be changed to reflect this reinterpretation. Current EPA guidance states that building material contaminated by the migration of PCBs from PCB bulk product waste, such as caulk or paint, is considered a PCB remediation waste. The proposed reinterpretation would have modified this guidance to specify that only PCB-

Sustainable Use of Resources • Life Cycle Approach to Managing Chemical Risks • Safe, Environmentally Sound Waste Management
Internet Address (URL): <http://www.epa.gov>

contaminated building material from which the PCB bulk product has been removed is a PCB remediation waste. That is, under the proposed reinterpretation, the distinction was in whether or not the PCB bulk product is still attached to the building materials.

The reinterpretation finalized today allows building material (i.e., substrate) "coated or serviced" with PCB bulk product waste (e.g., caulk, paint, mastics, sealants) at the time of designation for disposal to be managed as a PCB bulk product waste, even if the PCBs have migrated from the overlying bulk product waste into the substrate, provided there is no other source of PCB contamination on or in the substrate. However, if the substrate is not "coated or serviced" (i.e., the PCB bulk product waste, such as caulk or paint has been removed from the building material) at the time of designation for disposal, and the substrate is contaminated with PCBs that have migrated from the bulk product waste (or from another unauthorized disposal), the substrate would be considered a PCB remediation waste. This final reinterpretation is being modified from the proposal as described below.

In response to comments, we are modifying the proposed reinterpretation to allow for the possibility that, during a cleanup or demolition process, PCB bulk product waste (e.g., caulk, paint, mastics, and sealants) could separate from the contaminated building material before all of the waste is physically placed in the final disposal facility. At the time of designation for disposal, the contaminated building material would be deemed a PCB bulk product waste if the PCB material (e.g., caulk, paint, mastic or sealant) is still attached. This label as PCB bulk product waste would stay with the contaminated building materials. EPA recommends developing an abatement plan to document the decision to designate building materials as bulk product waste at the time of designation for disposal. If the PCB material has already been removed or flaked off at the time of designation for disposal, the building material would be deemed a PCB remediation waste, as established under the existing interpretations.

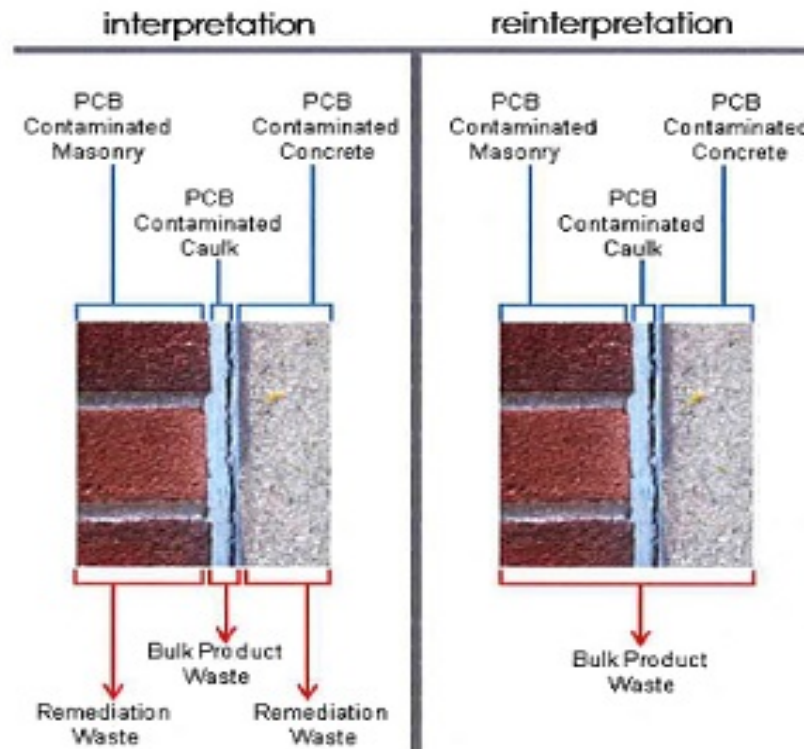
Rationale

I believe this reinterpretation will allow for accelerated cleanups of PCB-contaminated building material by providing a more straightforward path for disposal pursuant to the 40 CFR part 761 PCB regulations. Speeding up removal and disposal of the PCB-contaminated material is critical for reducing exposure potential, such as in schools or other locations where such PCB-contaminated building materials are currently in place. The previous interpretation applied different requirements to PCB-contaminated building materials than to the products that were originally manufactured with PCBs (e.g., paint or caulk). Labeling the building materials a different type of PCB waste than PCB bulk product waste (e.g., paint or caulk) can result in slower and more costly removal and disposal. This reinterpretation maintains existing environmental and human health protections, while it removes unnecessary burdens to allow for more expedient cleanups, thus reducing potential exposures, for example, in schools and commercial buildings.

In particular, protecting children's health from environmental risks is fundamental to EPA's mission. Caulks and paints containing PCBs were used in building some schools from 1950 to 1978. The reinterpretation will help to promote healthy school environments by reducing exposure to PCBs in schools.

The overwhelming majority of comments received supported the reinterpretation, with no comments in direct opposition. The reinterpretation provides the ability to dispose of any building material, contaminated by adjacent PCB bulk product waste (e.g., caulk, paint, mastics, and sealants), in accordance with the PCB bulk product waste regulations. Contaminated building materials that remain in place, after the PCB bulk product waste (e.g., caulk, paint,

EPA Reinterpretation



The reinterpretation impacts the highlighted segments of the following documents:

- [Contractors Handling PCBs in Caulk During Renovation \(PDF\)](#) (4pp, 488K)
- [PCB Caulk Abatement Steps 1 – 3 \(PDF\)](#) (12pp, 223K)
- [Example Decision Flowchart for Classifying Suspect Building Materials \(PDF\)](#) (1p, 29K)
- [Polychlorinated Biphenyl \(PCB\) Site Revitalization Guidance Under the Toxic Substance Control Act \(TSCA\) \(PDF\)](#) (87pp, 5.22MB)

To learn more about the reinterpretation, see the Federal Register Notice – [PCBs Bulk Product v. Remediation Waste](#) – (February 29, 2012). The comment period closed on March 30, 2012.

Disposal (cont'd)

PCB Bulk Product Waste:

Waste derived from manufactured products containing PCBs in a non-liquid state, at any concentration where the concentration at the time of designation for disposal was >50 ppm PCBs. PCB bulk product waste does not include PCBs or PCB items regulated for disposal under §761.60 (a) through ©, §761.61, §761.63, or §761.64. PCB bulk product waste includes, but is not limited to...

Disposal (cont'd)

PCB Bulk Product Waste (cont'd):

(a) Non-liquid bulk wastes or debris from the demolition of buildings and man-made structures manufactured, coated, or serviced with PCBs. PCB bulk product waste does not include debris from the demolition of buildings or other man-made structures that is contaminated by spills from regulated PCBs which have not been disposed of, decontaminated, or otherwise cleaned up in accordance with subpart D of this part.

Disposal (cont'd)

PCB Remediation Waste:

PCB remediation waste means waste containing PCBs as a result of a spill, release, or other unauthorized disposal, at the following concentrations > 50 ppm PCBs, regardless of the concentration of the original spill; materials which are currently at any volume or concentration where the original source was >500 ppm PCBs beginning April 18, 1978, or >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. PCB remediation waste means soil, rags, and other debris generated as a result of any PCB spill cleanup, including but not limited to:

Disposal (cont'd)

PCB Remediation Waste:

(1) soil, gravel, sediment (2) sewage sludge (3) Buildings and other man-made structures (such as concrete floors, wood floors, or walls contaminated from a leaking PCB or PCB-Contaminated Transformer), porous surfaces, and non-porous surfaces.

The Hot Topic- PCBs in Caulk

October 24, 2012

- EPA Office of Resource and Recovery PCB Bulk Product Waste Reinterpretation Letter
- Allows building material “coated or serviced” with PCB Bulk Waste (e.g. caulk, paint, mastics, sedants) at the time of designation for disposal to be managed as a PCB product waste.



Case Study



Remediation of PCB Caulk



Typical brick and concrete joints with Polychlorinated Biphenyl (PCB) containing exterior caulking.



Typical brick joints with PCB containing exterior caulking on the KSU Recreation and Wellness Center.

Case Study

Kennesaw
State UNIVERSITY



Remediation of PCB Caulk



Enclosed area of abatement on the western side of the KSU Student Recreation and Wellness Center (lower level).



Enclosed area of abatement on the western side of the KSU Student Recreation and Wellness Center (upper level).

Case Study

Kennesaw
State UNIVERSITY



Remediation of PCB Caulk



Areas of post PCB abatement (left) and enclosed areas of active abatement (right) on the west side of the Subject Structure.



Areas on the west side of the building following abatement of PCB containing caulk and adjacent brick substrate.

Case Study

Kennesaw
State UNIVERSITY



Remediation of PCB Caulk



Enclosed area of active PCB caulk abatement on the south side of the KSU Student Recreation and Wellness Center.



Western side of KSU Student Recreation and Wellness Center following abatement of PCB containing caulk.

Case Study

Kennesaw
State UNIVERSITY



Remediation of PCB Caulk



Area on western side of KSU Student Recreation and Wellness Center following PCB and ACM abatement (upper level).



Area on western side of KSU Student Recreation and Wellness Center following PCB and ACM abatement (upper level).

Case Study



Remediation of PCB Caulk



Area of southern hallway following abatement of PCB containing caulk.



Area of southern portion of the building following abatement of PCB containing caulk.

Case Study

Kennesaw
State UNIVERSITY



Remediation of PCB Caulk



Area of northern portion of the building following abatement of PCB containing caulk.



Typical enclosed containment area during abatement of PCB containing caulk on west side of building.

Case Study

Kennesaw
State UNIVERSITY



Remediation of PCB Caulk



Sikagard 670W Clear utilized to encapsulate areas of PCB containing caulk not scheduled for removal. Typical area of encapsulated caulk following first of at least two applications of coating.

QUESTIONS?

Panel Discussion

PCB Caulk Remediation

1. Ken Feeley, USEPA Region IV PCB Program Coordinator/Team Lead
2. Alex Lehocky, EHS Program Manager, Board of Regents of the University System of Georgia
3. Stephen Ndiritu, MS, CIH, CSP
Interim Director, EHS, Kennesaw State University
4. Nicholas Dasantos, NOVA Engineering
5. Ralph Leprone, Senior Project Manager, Winter Environmental

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