SAN FRANCISCO ESTUARY PARTNERSHIP

PCBs in Caulk Project

Controlling PCBs in Runoff at Building Demolition or Renovation

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Funding Acknowledgments

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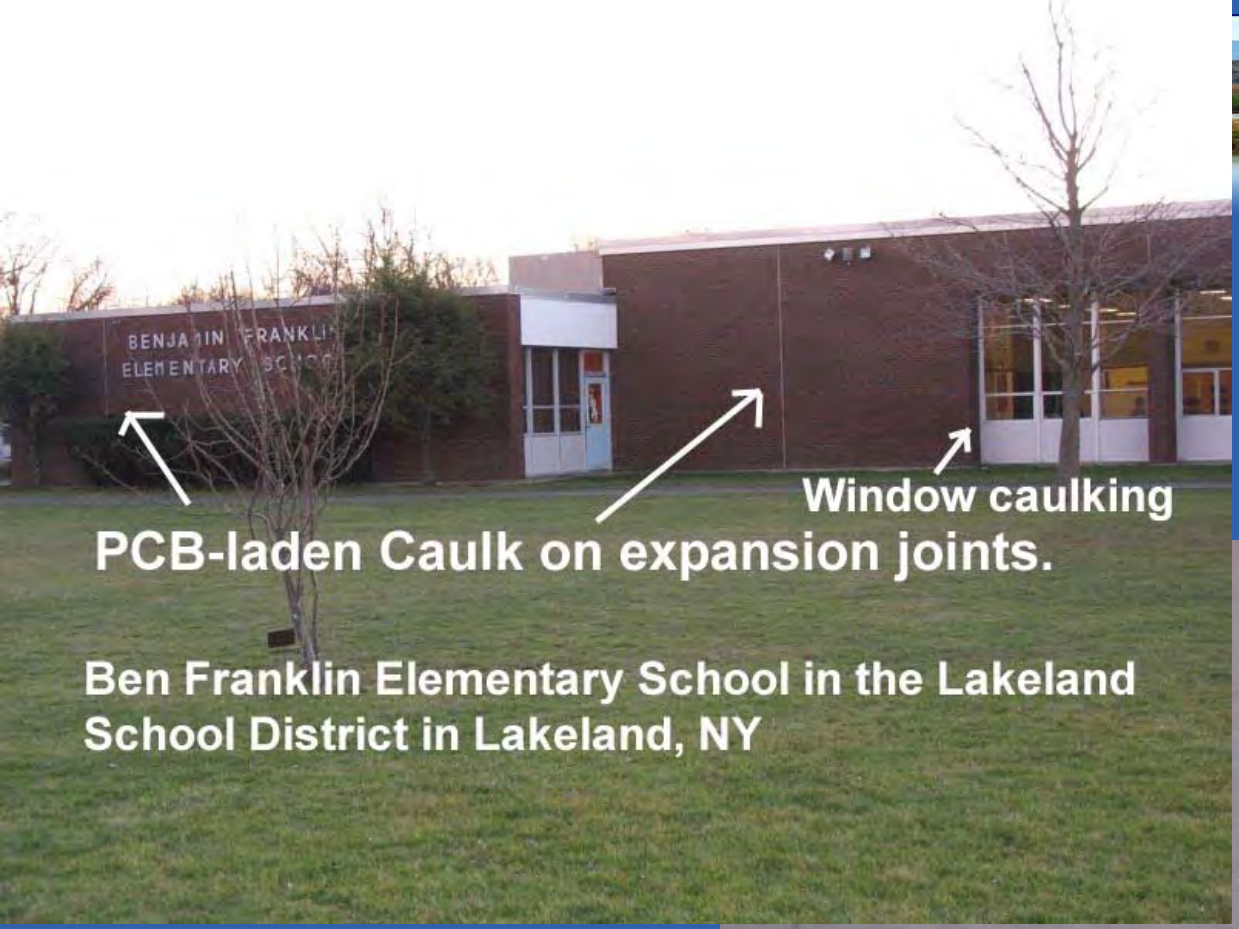
Outline

- Background on PCBs in Caulking
- Goals of PCBs in Caulk Project
- SFEI Study
- New Model Program for Municipalities
- Regulatory Issues

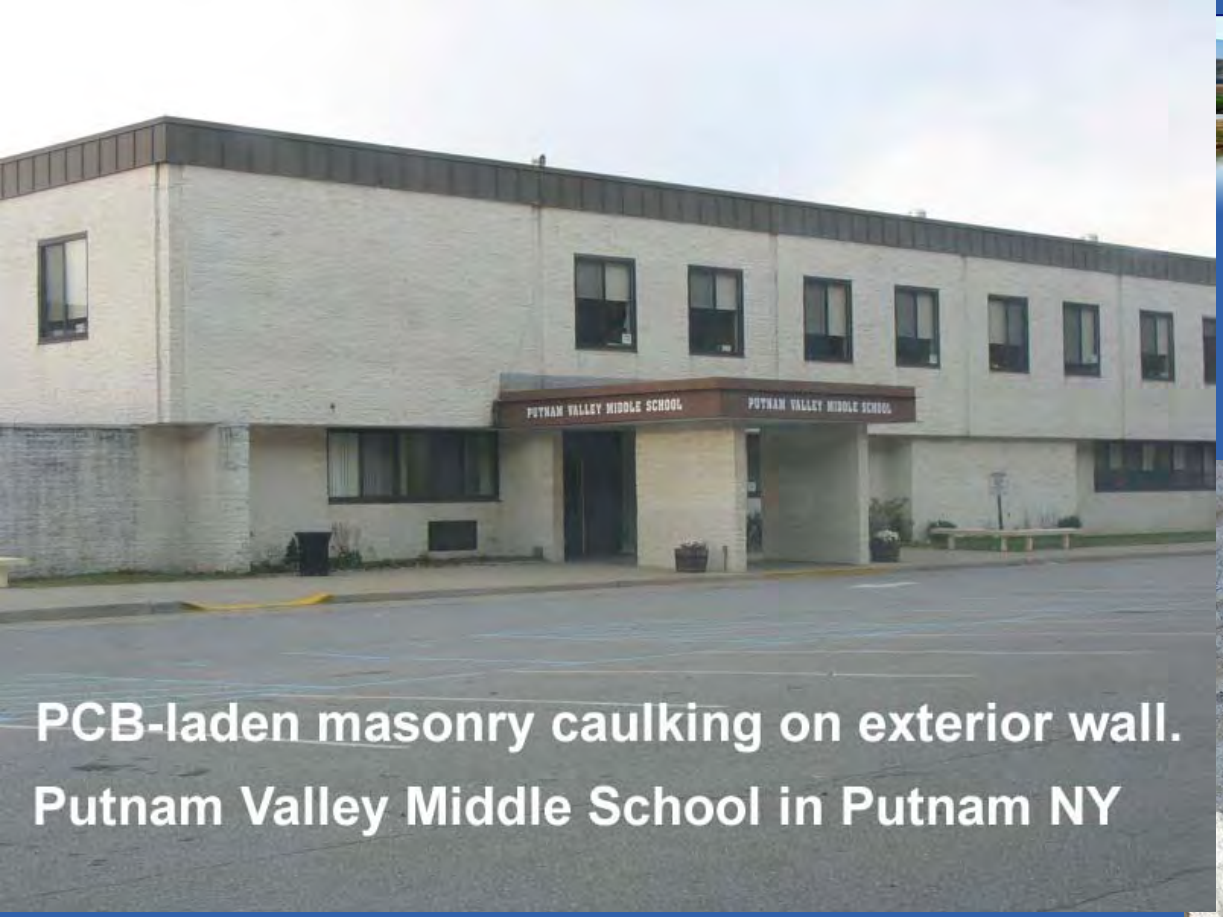
Background

- Caulking: a flexible material for sealing seams and gaps
  - Windows, doors, building segments, masonry, joints
- PCBs impart flexibility
  - Caulk, grout, paint, other coatings and sealants
- PCBs in caulk banned late 70s



School – New York

Photos courtesy of pcbsinschools.org

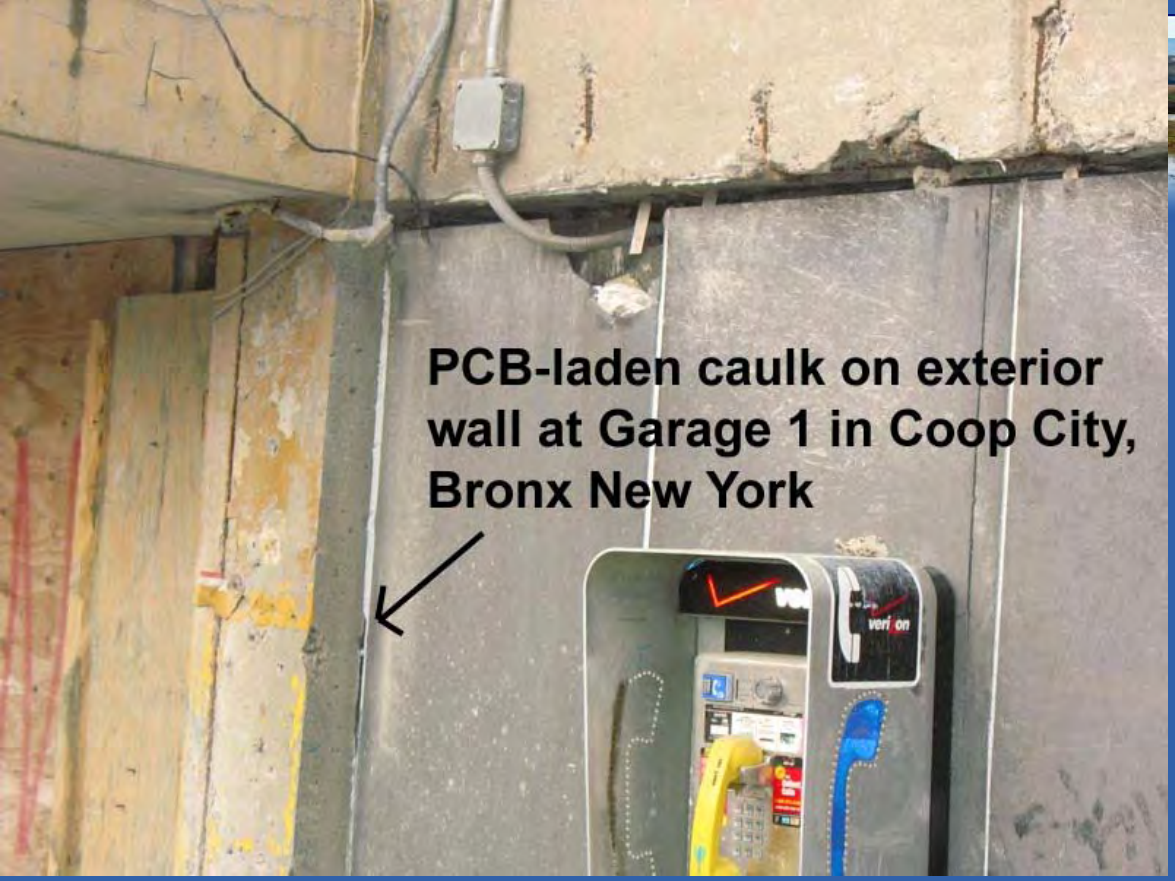


PCB-laden masonry caulking on exterior wall.
Putnam Valley Middle School in Putnam NY

School – New York

PCB-laden Masonry Caulk

Putnam Valley Middle School,
Putnam New York



Garage – New York

University Building - Boston, Massachusetts

Photos courtesy of pcbsinschools.org

Peak Use Times and Building Types

- Most likely in buildings **built or renovated** between 1950 and 1978
- Structures built earlier may have been renovated between 50s-70s
- Commercial, institutional buildings (offices) are more likely to have PCBs than residential buildings (single-family homes not at risk)

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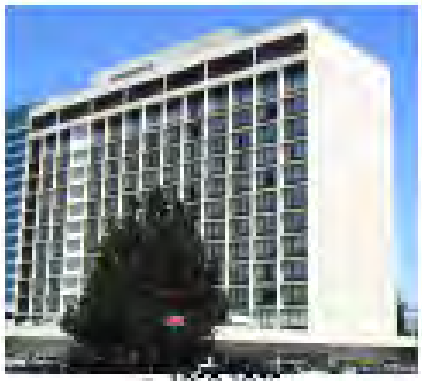
Examples	Characteristics

f. 44 story, 1960s, L-shape on the left; 20 story, 1914, with setback on the right



g. 1950-1975

i. 1950-1975

h. 1940-1950

j. 1950-1975

1950-1975

- Flat roof, typically with no cornice.
- Building is square or rectangular full height, fewer setbacks.
- First story and top story can be taller than other stories. In some cases the top story could be shorter than others.
- Exterior finishes metal or glass, pre-cast stone or concrete.
- Floors are concrete slab over steel or concrete beams.

Common Structure Types: S1, S2, S4, C1, C2

High use period:

1950s-70s

Images from FEMA Seismicity Maps

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Table D-1 Photographs, Architectural Characteristics, and Age of Residential Buildings

Examples	Characteristics
 a. 1965-1980  b. 1965-1980	Low-Rise Buildings (1-3 stories): • Typically wood or masonry • May have ground floor or basement parking, a soft story • Older buildings typically have more architectural detail, ornamentation • 1950s and later are more "modern" – lacking ornamentation, typically with more horizontal lines Common structural types: W2, RM1, RM2, URM
 c. 1965-1980  d. 1960-1975 reinforced concrete shear wall	Mid-Rise (4-7 stories) and High-Rise Buildings (8 stories and higher): • Typically, reinforced concrete (older, URM) • May have commercial ground floor, a soft story • Older buildings typically have more cornices, architectural detail, ornamentation • 1950s and later are lacking ornamentation, typically with stronger vertical or horizontal lines Common structural types: W2, RM1, RM2, URM

High use period:

1950s-70s

Images from FEMA Seismicity Maps

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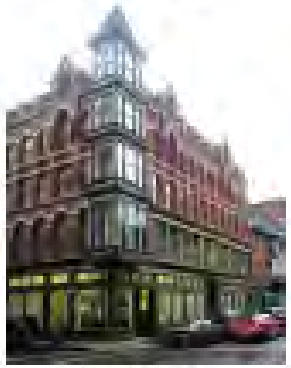
Examples

a. Pre-1930

b. 1910-1920
(Steel frame with unreinforced masonry infill that has been seismically rehabilitated)

c. 1920-1930

d. 1920-1930



Characteristics

Pre-1950

- Building has flat roof with cornices, or several set-backs.
- Ornate decorative work in concrete, terra cotta, cast stone or iron.
- Large bell tower or clock tower is common.
- Simple pattern of windows on all sides.
- Floors are concrete slabs on steel or concrete beams.
- Exterior is stone, terra cotta or concrete.

Common Structure Types: S2, S5, C2, C3

Earlier buildings

PCBs may have been added later

Images from FEMA Seismicity Maps

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Examples	Characteristics

k. Post-1975

l. Post-1975

m. Post-1975

n. Post-1975

o. Post-1975

Post-1975

- Flat roof, typically with no cornice.
- Building is square or rectangular for its full height, fewer setbacks.
- First story and top story can be taller than other stories. (In some cases, though, the top story could be shorter than others.)
- Exterior finishes: metal or glass, pre-cast stone or concrete, with little ornamentation
- Floors are concrete slabs over steel or concrete beams.

Common Structure Types: S1, S2, S4, C1, C2

Modern buildings No PCBs in caulk

Post 1980s

Images from FEMA Seismicity Maps

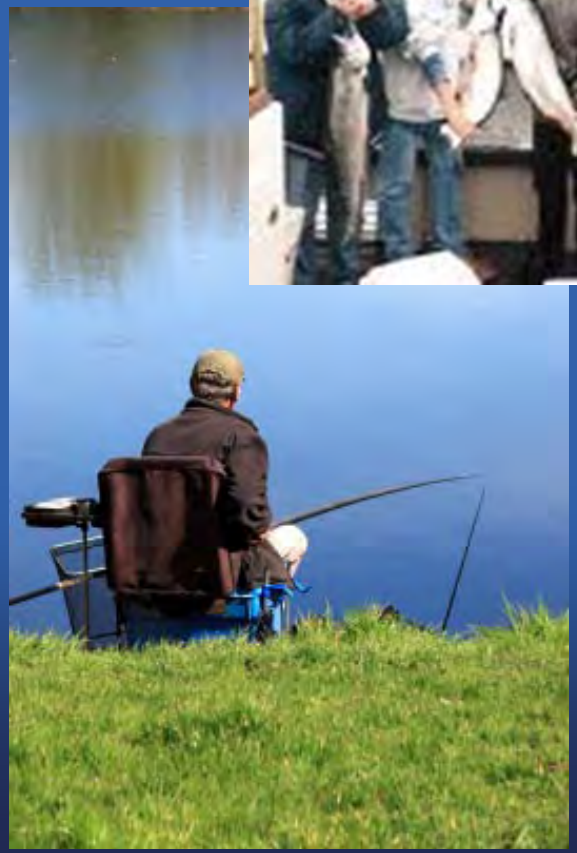
PCB concentrations in caulk: variable to very high

- Switzerland: <20 – 550,000 ppm (1,348 samples)
- Boston, MA: 70- 36,000 ppm (24 samples)
- Toronto, ON: <50-82,000 ppm (95 samples)

Runoff: PCBs Don't Just Stay in the Caulk

- Decaying caulk crumbles -> PCBs into air and dust (interior and exterior)
- Larger caulk pieces fall on the ground
- Remodeling or demolition: caulk pieces and particles released, can enter runoff

PCBs TMDL for San Francisco Bay



- Elevated PCB levels led to fish consumption advisory
- Current load (all sources): 33 kg/yr
- Current stormwater load: 20 kg/yr
- Stormwater TMDL allocation: 2 kg/yr
  - 90% reduction required for stormwater
- Basis for this project

PCBs in Caulk Project Objectives

- Estimate loading of PCBs to Bay from caulk at demolition
  - Field sampling at 10 Bay Area sites
  - Regionwide loadings estimate
- Develop regional management process for PCB-containing materials and waste during building demolition and renovation
  - Develop BMPs and municipal permitting process
  - Focus on demo/reno rather than standing building stock

Municipal Regional NPDES Permit for Stormwater (MRP)

- New stormwater permit (Oct ’09) covers 76 municipalities in 4 counties
- Governs several pollutants of concern, including PCBs
- Puts deadlines on PCBs TMDL requirements
- PCBs in Caulk project was incorporated into MRP, section C.12.b, as one of several pilot PCBs projects

Other pilot PCBs projects in MRP:

- Identify PCBs and PCB-Containing Equipment during Industrial Inspections
- Investigate and Abate On-Land PCB Hot Spots
- Evaluate and Enhance Municipal Sediment Removal and Management Practices
- Evaluate On-Site Stormwater Treatment via Retrofit
- Divert Dry Weather and First Flush Flows to POTWs
- Monitor, Conduct Fate and Transport Study, Risk Reduction (Fish)

PCBs in Caulk Project Partners

- BASMAA
- San Francisco Regional Water Quality Control Board
- Larry Walker Associates, Inc.
- Geosyntec Consultants, Inc.
- TDC Environmental, LLC
- San Francisco Estuary Institute