


March 19, 2015


Update to SMMUSD Board
 Juan Cabrillo Elementary School (JCES)
 Malibu High School (MHS)



Agenda

- Overview of ENVIRON's Work
- Preliminary Environmental Assessment (PEA)
- Polychlorinated Biphenyls (PCBs) in Building Materials
- Costs of Building Material Remedial Options


2



ENVIRON's Charge from District

- Assist the District in achieving its goal of assuring employees and the community that the schools within the District are healthy learning and working environments in a fiscally responsible manner and satisfying regulatory requirements
- Principles used in our work
 - Be protective of human health
 - Implement a science-driven approach to identify and implement solutions – essential for Agency approvals
 - Achieve regulatory agency approvals/concurrence
 - Employ best practices from other projects
 - Be implementable in all District schools
 - Be considerate of District resources


3



Regulatory Agency Roles

- DTSC's Role - Lead Agency for School Subsurface Investigations
 - Statutory authority to oversee California school subsurface evaluations
 - Directs Preliminary Environmental Assessment (PEA) to investigate soil, soil gas, and groundwater outside buildings per District's Voluntary Investigation Agreement (VIA)
 - Evaluates potential presence of chemicals based on historical/current uses
 - Determines if JCES and MHS exposures are at safe levels per PEA guidance
- EPA's Role – Evaluation of Potential PCB-impacted Building Materials under Toxic Substance Control Act (TSCA)
 - Exclusive jurisdiction of EPA
 - Evaluates sample results
 - Evaluates potentially complete exposure pathways
 - Provides technical review of building inspections, best management practices (BMPs) and sampling plans
 - Approves removal and remediation plans
 - Determines if classroom/building conditions are protective of public health


4



Agency Approvals Require Scientific Approach

- Planning Documents for Investigation
 - Rooted in scientific principles
 - Based on agency statutes, regulations, and guidance
 - Open for stakeholder comments
 - Follows established methods and process
 - Reflective of regulatory requirements
- Investigation Execution
 - Follows approved plan
 - Uses scientific methods that allows for replication
 - Documentation (photos, field notes, Chain of Custody, etc.) of activities
- Scientific Reporting
 - Includes raw data, interpretation of results, Quality Assurance/Quality Control, conclusions


5



What's Been Done

- Thorough and exacting scientific studies, which can be found on the District's website
- PEA
 - Investigation with 525 samples analyzed
 - Localized removal action east of Building G
 - Results are acceptable for school uses
 - Land can be used for any purpose
- Building Materials
 - 250 air and 765 surface dust wipe samples taken
 - EPA made finding that there is no unreasonable risk at MHS or JCES
 - Collected data that shows any potential sources can be safely managed in place until the next renovation or demolition
 - EPA approved plan under TSCA
 - Removal scheduled (June) for MHS Library, 3 rooms in Building E and woodshop

6




Investigation Overall Conclusions

- PEA - Results were below screening thresholds for school use
- Building Materials - EPA made finding MHS and JCES are being managed in a manner protective of human health

EPA research studies show that primary health concerns from PCBs in building materials derive from inhalation of contaminated air, and secondarily from contact with PCBs in dust and subsequent incidental ingestion. Overall, the sampling data from the two schools demonstrate that these PCB exposure pathways are currently being addressed by the District's BMPs in a manner that protects public health. Thus, the District's undertaking of the BMPs, as verified by pre- and post-BMP sampling data, demonstrates that the TSCA standard for no unreasonable risk is currently being met at MHS and JCES.

10/31/2014 EPA approval letter to SMMUSD

7

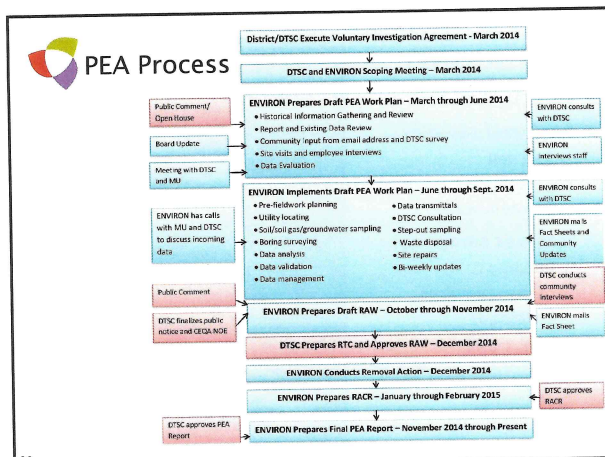


Preliminary Environmental Assessment (PEA)

PEA Approach

- DTSC has statutory authority for environmental evaluations of schools (Schools Evaluation Division)
- District and DTSC executed VIA
- Evaluation vehicle is the PEA
 - Driven by scientific principles
 - Based on established regulations and vetted guidance
 - Incorporates all stakeholders
 - Follows prescribed and thorough process - NO SHORTCUTS
- Evaluate subsurface at JCES and MHS using a sound scientific approach to understand if schools are safe

9



PEA Overview


- Identified 18 Areas of Interest (AOIs) that led to extensive investigation
- Advanced 778 borings (742 soil and 26 soil gas)
- Analyzed 454 soil, 62 soil gas, and 9 groundwater samples (total 525 samples)
- Samples selectively analyzed for PCBs, pesticides, herbicides, metals, TPH, VOCs, and pH by state-certified laboratory
- Conducted third-party data validation

11

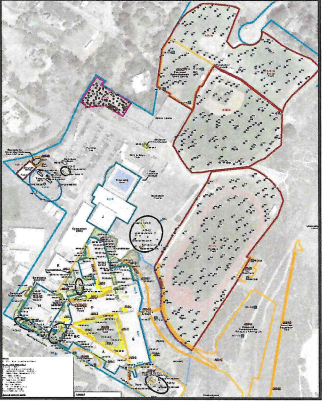
PEA - JCES

- 4 AOIs
- Analyzed samples:
 - 135 soil
 - 12 soil gas
 - 3 groundwater


12

 **PEA - MHS**


- 14 AOIs
- Analyzed samples:
 - 319 soil
 - 50 soil gas
 - 6 groundwater
- Step-out sampling:
 - Building G
 - Cornucopia Area
 - Building H
- Limited soil excavation east of Building G




13

 **PCBs Removal Action at Building G Area**

- Soil sampling results were below the DTSC risk thresholds for schools
- Excavation ensures area can be used for any purpose
- Excavated and disposed of approximately 15 yd³ of non-hazardous soil
- Expect No Further Action from DTSC





14

 **PEA Next Steps**

- Investigation has been completed at both schools
- Localized removal action east of Building G is complete
- Removal Action report submitted to DTSC on February 20, 2015
- PEA Report to be delivered-April 2015
- Expect to receive final approvals from DTSC
 - April/May
 - No further investigation/remediation requested
 - Results are acceptable for school uses
 - Land can be used for any purpose

15

 **Polychlorinated Biphenyls (PCBs) in Building Materials**

 Toxic Substance Control Act (TSCA) - 101

- TSCA Regulations
 - Regulates many substances including use of PCBs
 - Intended to remove PCBs from the environment over time
 - Set 50 ppm standard for PCBs as a determination of prohibited use
 - Gives EPA authority to implement TSCA through regulation and guidance
- EPA's Schools Policy
 - EPA uses risk-based policy for regulation of PCBs, asbestos, and lead paint in schools and public buildings
 - Evaluates risk presented by exposure to building materials
 - If risk is low, materials are managed in place, removed at end of life, and then disposed of

17

 Primary ENVIRON Efforts for SMMUSD (started March 2014)

- Comprehensive Plan applicable to any of the 16 schools in District
 - Used as basis for more specific next steps at MHS and JCES
- Development of Specific Plan for MHS/JCES
 - Supplemented on September 26, 2014
 - Approved by EPA on October 31, 2014
- Exposure monitoring pilot study
 - Summer 2014
 - Winter 2014/2015
 - Summer 2015
- Other services not related to MHS



18

 ENVIRON's Approach

- EPA has oversight of PCBs in building materials
- Important resources utilized
 - EPA's TSCA regulations
 - EPA's guidelines, research, and recommendations
 - East Coast schools
 - ENVIRON's experience in EPA Region I and II

19

 Key concepts from these relevant PCB resources

- Some sources can result in high airborne exposures (e.g., light ballast and associated leaks)
- Other sources may not result in high airborne exposures (e.g. caulk)
- Evaluation of exposures is needed to determine if schools are safe and to evaluate impact from potential sources
- Some building materials containing PCBs can be managed in place; lessons learned from asbestos and lead paint
- Removal of some materials is complex

20

Important to note: PCBs can be found in other materials besides caulk

- Multiple sources have been found in schools
 - Primary sources (e.g., fluorescent light ballasts, caulk, paint)
 - Secondary sources (e.g., concrete, wood, etc.)

Source: USEPA, 2012, September. Polychlorinated Biphenyls (PCBs) in School Buildings: Sources, Environmental Levels, and Exposures. Available online: http://www.epa.gov/pcb/incaulk/pdf/pcb_EPA600R12051_final.pdf

Key TSCA Compliance Accomplishment: SMMUSD's Approved Plan for MHS/JCES

- July 3, 2014 Site Specific Plan as supplemented on September 26, 2014 approved by EPA (10/31/14)
- Main features:
 - Specific Plan covers both manage-in-place elements (e.g. BMPs) and detailed remediation steps
 - Removal scheduled (June) for MHS Library, 3 rooms in Building E and woodshop
 - Additionally any specific caulk identified and verified to have PCBs ≥ 50 ppm, within a year or other timeframe as approved by EPA
 - Providing notification to EPA for additional areas
 - Includes removal of old light fixtures, some of which showed evidence of past ballasts leakage
 - Includes pilot monitoring study (air/wipe)

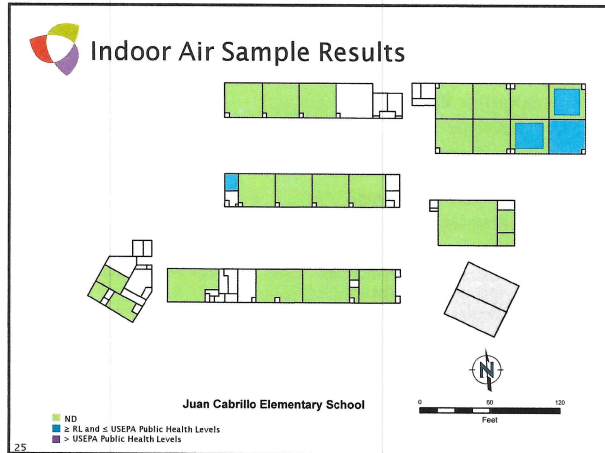
Key EPA School Policy Accomplishments at MHS/JCES

- PCB exposures (air/dust) are acceptable
 - 250 air and 765 surface wipe samples total to date
 - Results were below Region IX's no-further-action benchmarks including rooms reportedly tested by third parties
 - Wipe samples: 85% Summer and 88% Winter samples were not detected
 - Air samples: 73% Summer and 100% Winter samples were not detected
 - EPA concurred that the data meet TSCA's standard for no unreasonable risk and do not present a public health risk
 - A majority of the buildings had acceptable exposure levels prior to annual BMP cleaning
 - Demonstrates that any potential sources in the schools are not contributing to unacceptable exposure levels

Indoor Air Sample Results

Legend:
 ND
 \leq RL and \leq USEPA Public Health Levels
 $>$ USEPA Public Health Levels
 Room is closed

Malibu High School



25

Key EPA School Policy Accomplishments at MHS/JCES (cont.)

- BMP cleaning was effective and frequency is more than sufficient
- Evidence of past ballasts leaks in old light fixtures
 - Given air results, past leak residues are not causing unsafe levels of PCBs in air
 - District is replacing old light fixtures
- Collectively, shows any potential sources can be safely managed in place until the next renovation or demolition

26

MHS/JCES is not like other examples cited in other venues


- All MHS/JCES exposure data collected to date indicate PCB exposures (air/dust) are within safe levels
 - Demonstrates that any potential sources in the schools are not contributing to unacceptable exposure levels
- This is different than East Coast Schools cited
 - Westport Middle (MA), Burke Elementary (MA), Clark Elementary (CT), Osborn Hill Elementary (CT)
 - Caulk sampling conducted as part of planned renovation/repairs
 - Air testing done after discovery of materials with > 50 ppm PCBs
 - Unlike MHS/JCES, some air tests at these schools were above USEPA's Public Health Levels for Schools

27

Hartford, CT Clark Elementary School

- **December 2014:** PCBs detected in paint samples (12 – 100 ppm) during pre-renovation building materials testing
 - Associated with renovation of fire protection system (sprinklers)
 - Required by CT Department of Education, Office of School Facilities (OSF) for projects seeking State reimbursement
- **December 19, 2014:** PCBs detected in air samples (194 to 223 ng/m³)
- **December - January 2015:** Consultant investigates other building materials to determine source of PCBs in air
 - PCBs detected in caulk (31,000 – 97,000 ppm)
 - PCBs detected in indoor air after several days of exchange (110 to 571 ng/m³)
 - Report published in March 2015
- **January 2015:** CT DPH says air is “way below a level that could cause health problems”
- **January 12, 2015:** Students relocated to other schools


28



Hartford, CT Clark Elementary School (cont.)

- **Next Steps/Coming Months:**
 - Additional sampling (soil, substrate, etc.) necessary to finalize PCB remediation plan and get EPA approval
 - Developing a pilot study to determine effective remediation techniques
 - Seek bids from PCB removal firms to prepare detailed cleanup plan for EPA approval
 - School superintendent estimated it could take more than a year before school can be re-occupied
 - Hartford Courant reported a "ballpark" figure of \$4M for remediation that could easily change
 - Goal is to "get air levels to an acceptable level" as quoted in Hartford Courant article

29



PCB Plan Moving Forward


- **Summer Break 2015**
 - Old light fixture replacement (by August 14, 2015)
 - Caulk removal in 4 rooms and MHS library (by June 30, 2015)
 - Annual BMP cleaning
 - HVAC inspection/cleaning
 - PCB sampling - given results to date, smaller effort
 - Conclusion of Pilot Study - basis for future monitoring recommendations
 - Testing related to caulk removal activities
- **Future ENVIRON activities at MHS/JCES**
 - Reduced level of assistance
 - Areas potentially include future monitoring and District's ongoing implementation of Specific Plan

30



ENVIRON's Costs

31




PEA Investigation Costs

Laboratory Cost Per Sample: \$52 to \$775 (525 samples analyzed)

- ← Work Plans
- ← Pre-fieldwork planning
- ← Utility locating
- ← Soil, soil gas, and groundwater sampling
- ← Surveying
- ← Expedited third party data validation
- ← QA/QC
- ← Data management
- ← Waste disposal
- ← Site repairs
- ← Communication with DTSC and community
- ← Other direct expenses (supplies, equip. rental)
- ← ENVIRON data analysis
- ← Data transmittals and documentation
- ← PEA Report

Total Cost Per Sample: \$1,700 to \$2,400

32



PCB Summer Investigation Costs

Laboratory Expedited Cost Per Sample (198 air; 548 surface wipes):

- Air \$228
- Surface Wipes \$130


- ← Planning and SMMUSD coordination
- ← Communications with regulatory agencies
- ← Room/Building inspections
- ← Collection of air and surface wipe samples
- ← Other direct expenses (e.g., shipping, supplies, equip. rental)
- ← Third party data validation
- ← ENVIRON data analysis
- ← Reports and documentation
- ← QA/QC

Total Cost Per Sample:

- Air ~\$1,600
- Surface Wipes ~\$1,500

To be done in 39 days of Summer school - all work expedited

33



ENVIRON's MHS/JCES Investigation Efforts - Costs (including direct costs)


- Worked with the District to define scope/schedule of the efforts needed to accomplish District goals
 - Regular updates with the District on level of effort
- PEA
 - Investigation Work Plan: \$240k
 - Execution: \$850k
 - PEA Report: \$150K
 - RAW: \$175k
- Building Materials
 - Best Management Plans and EPA plans: \$160k
 - BMP Training: \$23k
 - Summer 2014 activities: \$1.1M
 - Winter 2014/2015 sampling: \$150k
- Communications and Meetings: \$377k

34

30k
day



Costs of Building Material Remedial Options



EPA Involvement in Remediation

- EPA approval required at some project stages
- Prudent to seek EPA concurrence and peer review at many other project stages
- District/EPA communication builds transparency in the project
- Achieves District goal of seeking input from expert lead agencies
- EPA Region IX has requested to be kept informed and has provided comment on all work to date at key project milestones

36

Remediation Steps & EPA Involvement

- Implementation of Building Material Sampling Program
 - PCB Sampling Summary Report to EPA for review
- EPA and Public Stakeholder Involvement
 - Remediation Work Plan, under Bulk Product Waste removal, to EPA for their review and concurrence
- Abatement of PCB Building Materials
 - Notify EPA of changes in conditions or new information
- Post-Remediation Confirmatory Sampling
 - PCB Completion Report to EPA upon finishing work

PCB Remediation Options

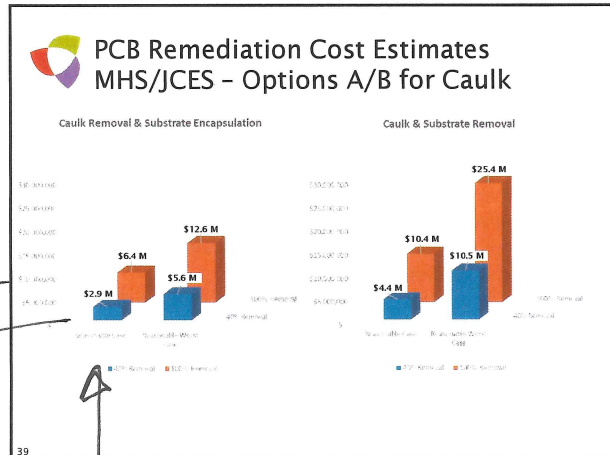
| | | |
|--|---|---|
| Option A - Caulk (Temporary Solution) Remove caulk > 50 ppm PCBs and Encapsulate adjacent contaminated substrate (brick, cement, wallboard, etc.) | Option B - Caulk (Permanent Solution) Remove caulk > 50 ppm PCBs and Remove adjacent contaminated substrate material containing > 1 ppm PCBs | Option C (PCB-free Solution) Abate all PCB impacted materials, Demolish school buildings constructed pre-1981 and Rebuild |
|--|---|---|

Major Cost Drivers (Options A and B)
 % of caulk > 50 ppm PCBs drives:

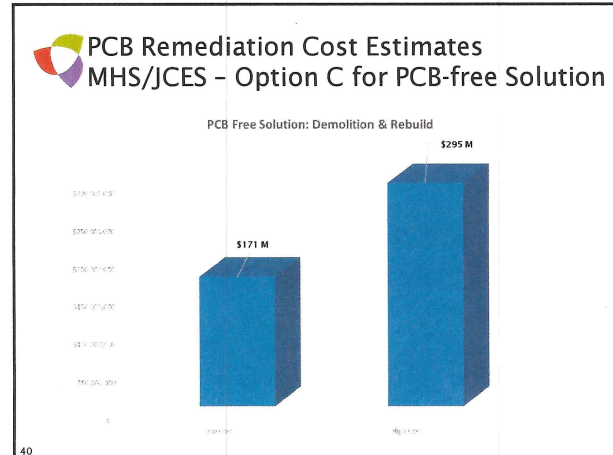
- Extent of remediation efforts
- Extent of consultant sampling efforts for characterization, oversight, and post-remediation confirmatory sampling
- Assumed 40% (reasonable case) and 100% (reasonable worst case)

Major Cost Driver (Option C)

- Demolition and construction costs



100%
40%



121M 295M

A
 temp
 Blue & 2.9-
 Red & 5.6
 6.4
 12.6
 B
 Blue 4.4 10.5
 Red 10.5 25.4

39 days of summer



Reference PCB Remediation Cost Estimates from other Schools¹

- All had air concentrations above EPA Public Health Levels for Schools
- Five Public Schools/New York City (WDOE, 2015)
 - Feasibility study evaluated caulk remedial/mitigation options
 - \$3.2M to \$3.6M per school (abatement/mitigation)
- Elementary School/Lexington, MA (Goddard, 2010; Parker 2014)
 - Estimated \$2.8 to \$4.2 million to relocate students during remediation
 - Officials decided to replace the school at a cost of \$33M to \$40M
- Westport, MA School (CGKV Architects, 2013)
 - Costs of initial 2011 Source Removal Project = \$3.2 million
 - Feasibility study recommended the following sustainable solution:
 - Mandatory removal of remaining PCB Source Material = \$1.6M;
 - Limited removal & encapsulation of known PCB Remediation Waste = \$4.4M; and
 - Remediation of unconfirmed PCB Remediation Waste = \$1.75M - \$2.1M (encapsulation versus removal)

¹ Washington Department of Ecology, 2015. PCB Chemical Action Plan. Publication No. 15-07-002. P. 161. February 2015.




Summary

- PEA
 - Results are acceptable for school uses
 - Land can be used for any purpose
- Building Materials
 - EPA made finding that there is no unreasonable risk at MHS or JCES
 - Collected data show that any potential sources can be safely managed in place until the next renovation or demolition while protecting public health & EPA agrees
 - Have EPA approved plan under TSCA
 - Removal scheduled (June) for MHS Library, 3 rooms in Building E and woodshop

42



Thank you



Region IX Benchmarks

- Air benchmarks protect students and teachers
 - Accounts for exposure in schools and background
 - Used nationally in schools

| 3-<6 yr | 6-<12 years Elementary | 12-<15 years Middle | 15-<19 years High | 19+ years Adult |
|-----------------------|---------------------------|------------------------|-----------------------|-----------------------|
| 100 ng/m ³ | 300 ng/m ³ | 450 ng/m ³ | 600 ng/m ³ | 450 ng/m ³ |

- Surface benchmark 1 ug/100 cm²
 - More protective than the 10 ug/100 cm² required under TSCA and frequently applied
- Air and wipe benchmarks are protective of cancer and non-cancer endpoints

<http://www.epa.gov/pbcsincaulk/maxconcentrations.htm>

44

