Upcoming Work in Buildings 85/87/91

Investigation Area C1

Presented to
Mare Island Restoration Advisory Board

July 30, 2020

Discussion Topics – Buildings 85/87/91

- **Buildings 85/87/91 Description**
- **Buildings 85/87 – Chlorinated Volatile Organic Compounds in Soil Gas**
- **Building 87 – Polychlorinated Biphenyls**
- **Building 91 – Polychlorinated Biphenyls and Mercury**
- **Upcoming Work**
  - Building 85/87 Soil Gas Investigation
  - Building 87 PCB Remediation
  - Building 91 PCB and Mercury Remediation
- **Questions**

Buildings 85/87/91


Building 91
Building 85
Building 87
Nimitz Avenue
Railroad Avenue
LMI Office
"A" Street
Azuar Drive

Building 91

View to the Southeast

Building 87

Building 85

View to the Northeast

Building 87 Interior

Building 91 Interior

Buildings 85/87/91 – Description

- **Located in Investigation Area C1 (IA C1)**
  - Building 85
    - Constructed in 1858
    - Constructed of Brick, Mortar, Metal with a Concrete / Asphalt Foundation
    - Covers an Area of Approximately 31,400 Square Feet
    - Uses – Foundry, Storage and Nuclear Training Facility
  - Building 87
    - Constructed in 1858
    - Constructed of Brick, Mortar, Metal with a Concrete / Asphalt Foundation
    - Covers an Area of Approximately 31,150 Square Feet
    - Uses – Foundry, Machine Shop, Storage and Nuclear Training Facility
  - Building 91
    - Constructed Between 1858 and 1871
    - Constructed of Brick, Mortar, Metal, Wood with a Concrete / Asphalt Foundation
    - Covers an Area of Approximately 11,100 Square Feet
    - Uses – Boiler / Machine Shop, Storage and Radium Painting Facility

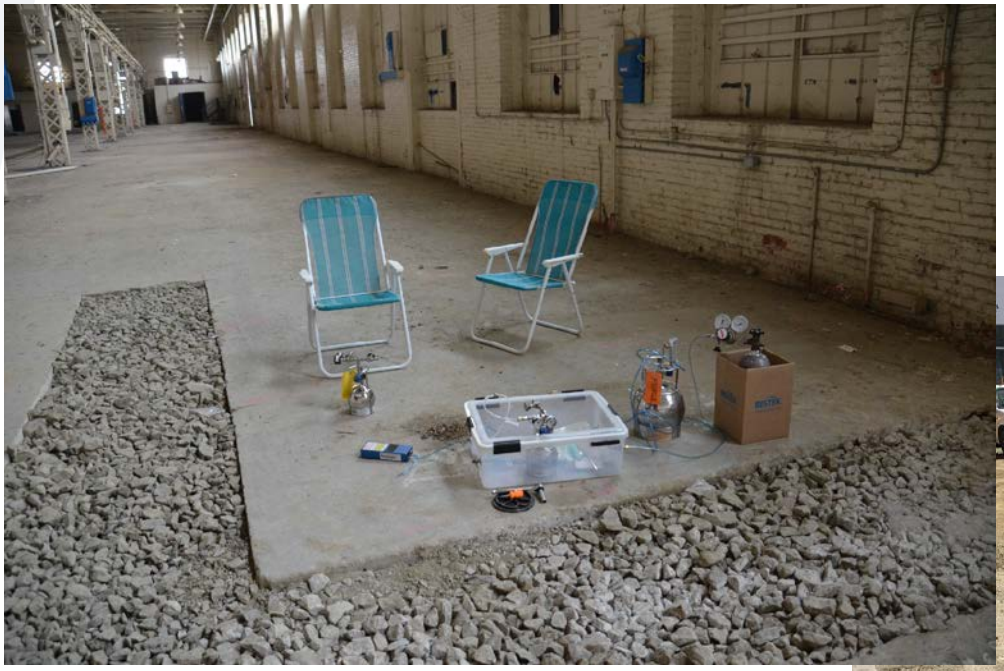
Screening Levels / Cleanup Goals – Chloroform, TCE, PCBs and Mercury

- **Screening Levels / Cleanup Goals – Commercial / Industrial**
  - Chloroform
    - ✓ Soil Gas - 530 Micrograms per Cubic Meter of Air (µg/m3)
    - ✓ Indoor-Air – 0.53 µg/m^3
  - Trichloroethene (TCE)
    - ✓ Soil Gas - 3,000 µg/m^3
    - ✓ Indoor-Air - 3 µg/m^3
  - Polychlorinated Biphenyls (PCBs)
    - ✓ Porous Solid Media – 0.74 Milligrams per Kilogram (mg/kg)
    - ✓ Non-Porous Solid Media – 10 Micrograms per 100 Square Centimeters (µg/100 cm^2)
  - Mercury
    - ✓ Solid Media – 4.4 mg/kg
    - ✓ Indoor-Air – 0.13 µg/m^3

Building 85/87 – Chlorinated Volatile Organic Compounds in Soil Gas

- **Building 85/87 Chlorinated Volatile Organic Compounds (CVOCs) in Soil Gas**
  - 2009 Passive Soil Gas Survey
    - ✓ 42 GORE-SORBER® Samplers in Building 85 and Southern Portion of Building 87
      - ✓ Semi-Quantitative / Qualitative Method
  - 2012 Soil Gas Survey
    - ✓ 10 Soil Gas Samples Collected from Temporary Monitoring Locations
      - ❖ Based on the 2009 Passive Soil Gas Survey
  - 2014 Soil Gas Survey
    - ✓ 7 Soil Gas Samples Collected from Temporary Monitoring Locations
      - ❖ Step-Out Locations Based on the 2012 Survey
  - 2017 Soil Gas Survey
    - ✓ 30 Soil Gas Samples Collected from Semi-Permanent Monitoring Locations
      - ❖ Samples Collected During Wet and Dry Seasons
  - Exceedances of Soil Vapor Screening Levels (SVSLs)
    - ✓ Trichloroethene (TCE) Detected at Two Locations
      - ❖ One Interior and One Exterior Building Location with Maximum TCE Concentration of 6,400 Micrograms Per Cubic Meter of Air ($\mu g/m^3$) at Interior Location
    - ✓ Chloroform Detected at One Location
      - ❖ One Exterior Building Location with Maximum Chloroform Concentration of 2,300 $\mu g/m^3$

Building 85/87 – Chlorinated Volatile Organic Compounds in Soil Gas (Continued)



Building 87 – Polychlorinated Biphenyls (Continued)

- **Building 87 Polychlorinated Biphenyl (PCB) Site**
  - Building 87 PCB Site Unknown Location (UL) #01
    - ✓ Stain on Concrete Floor Inside and on the Northeast Corner of Building
    - ✓ Investigations Began in 1994
      - Collected 15 Wipe Samples Collected from Stain Specific Locations
        - Maximum PCB Concentration Detected at 23 µg/100 cm^2
    - ✓ Between 2004 and 2019 – Additional Investigations and Remediation Has Occurred
      - Removed Approximately 700 Square Feet of Wood Planking
      - Scabbled Approximately 2,500 Square Feet of Concrete / Asphalt
      - Collected 102 Concrete / Asphalt Characterization / Confirmation Samples
      - Collected 18 Wood Characterization / Confirmation Samples
      - Collected 18 Soil Characterization / Confirmation Samples
      - Collected 4 Brick Characterization Samples
      - Maximum Concentrations of PCBs Remaining:
        - In Wood at 30 mg/kg
        - In Soil at 2.6 mg/kg
        - In Concrete / Asphalt at 23 mg/kg

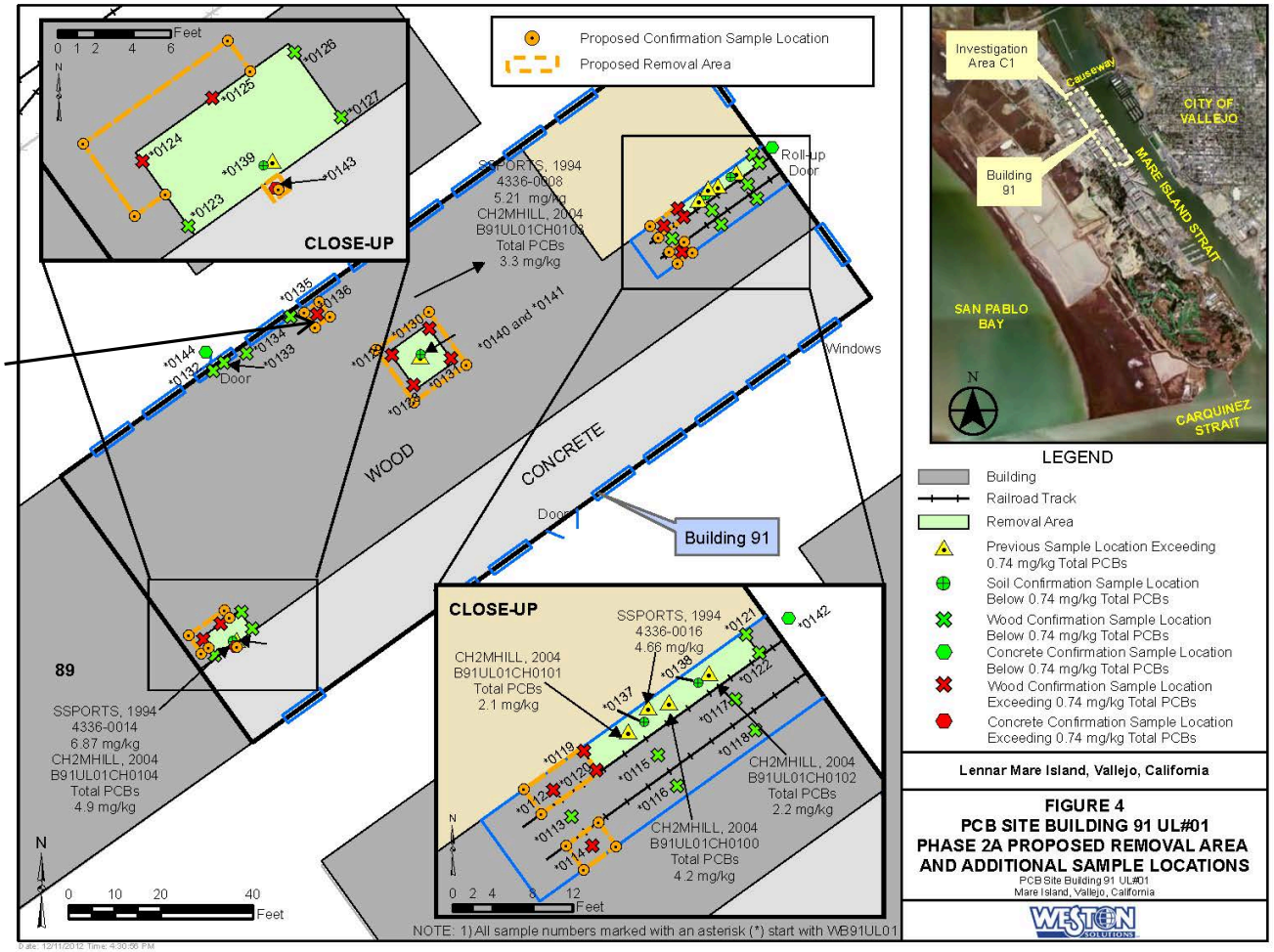
Building 87 – Polychlorinated Biphenyls (Continued)

Building 91 - Polychlorinated Biphenyls and Mercury

- **Polychlorinated Biphenyls (PCBs) and Mercury Site**
  - Building 91 PCB Site UL#01
    - ✓ Floor Stains Inside Building on Wood Floor
    - ✓ Investigations Began in 1994
      - 16 Samples Collected – 3 Wood Chip and 13 Wipe (Wood, Concrete, Metal) Samples Collected from Stain Specific Locations
        - Maximum PCB Concentration Detected in Chip Samples at 6.87 mg/kg
        - Maximum PCB concentration Detected in Wipe Samples at 7.82 µg/100 cm^2
    - ✓ While Performing PCB Remediation in 2013 – Discovered Elemental Mercury on Wood Floor Joists
    - ✓ Between 2013 and 2019 – Additional Investigations and Remediation Has Occurred
      - Removed Approximately 7,000 Square Feet of Wood Planking and Underlying Wood Joists
      - Scabbled Approximately 1,100 Square Feet of Concrete
      - Removed Approximately 1,000 Tons of Soil / Debris
      - Collected 14 Wood Plank Characterization Samples
      - Collected 48 Concrete Characterization / Confirmation Samples
      - Collected 24 Brick / Wood Wall Characterization Samples
      - Collected 72 Soil Confirmation Samples
      - Maximum Concentrations of PCBs Remaining:
        - In Concrete at 11 mg/kg (Stairs Leading from Building 89 to Building 91)
        - In Soil / Debris at 0.23 mg/kg
      - Maximum Concentrations of Mercury Remaining:
        - In Concrete at 160 mg/kg
        - In Soil / Debris at 180,000 mg/kg

Building 91 - Polychlorinated Biphenyls and Mercury (Continued)

Location of Elemental Mercury Discovery in 2013



Building 91 - Polychlorinated Biphenyls and Mercury (Continued)

Elemental Mercury in Underlying Soil

Elemental Mercury on Floor Joists and Support Boards

Building 91 - Polychlorinated Biphenyls and Mercury (Continued)

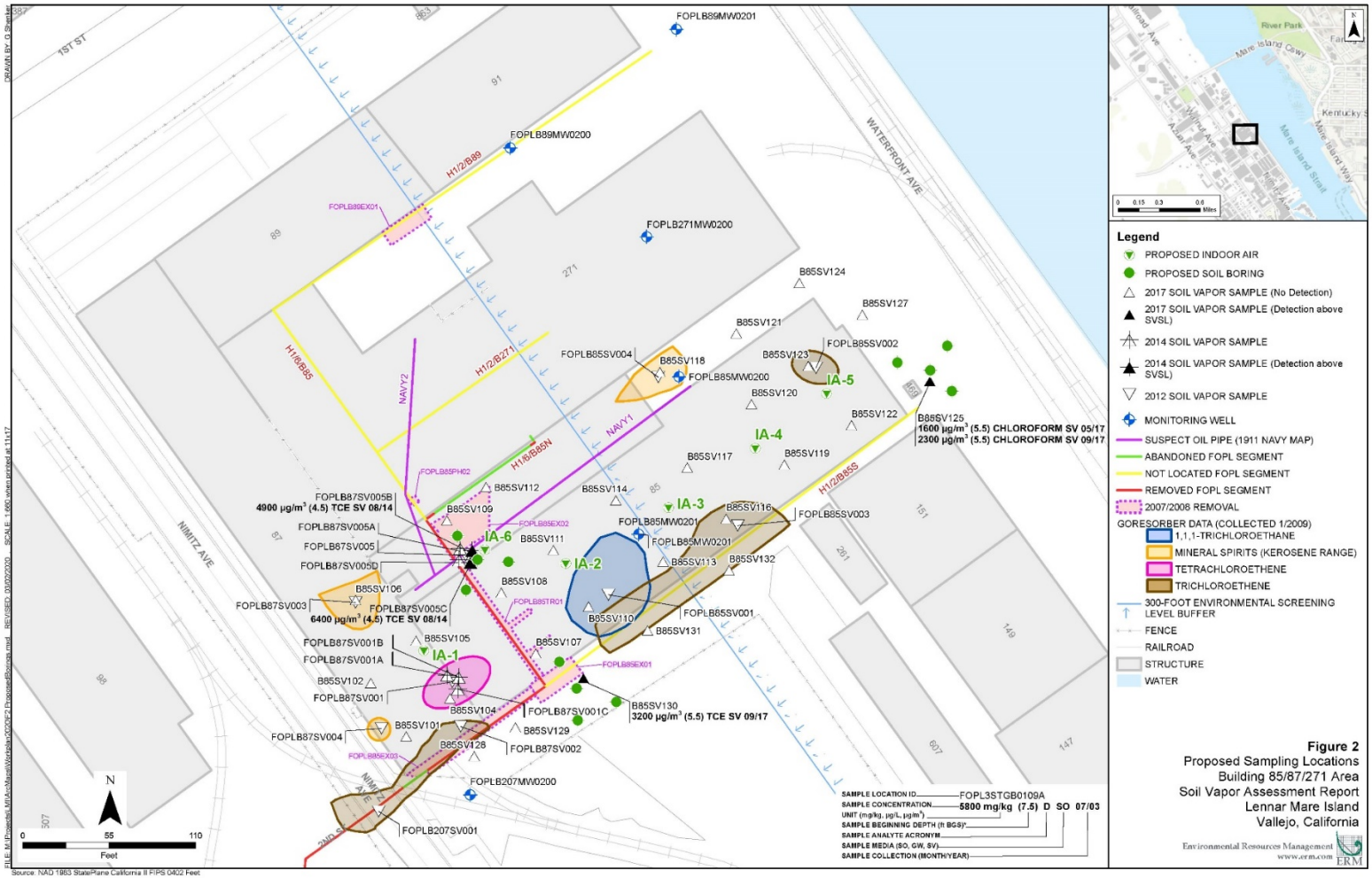
Elemental Mercury on Concrete Support Column Footer

Building 91 - Polychlorinated Biphenyls and Mercury (Continued)

Upcoming Work
Building 85/87 CVOCs in Soil Gas

- **Advance 12 Soil Borings**
  - Maximum Depth of 10 Feet Below Ground Surface – At Least 2 Feet Past First Groundwater
- **Collect Soil and Groundwater Samples from Each Soil Boring**
  - Soil Samples Collected at Depths of 2, 4, 6, 8 and 10 Feet Below Ground Surface
  - One (1) Groundwater Sample Per Boring
- **Collect Soil Gas Samples from 8 Existing Semi-Permanent Soil Gas Monitoring Locations**
- **Collect 6 Indoor-Air Samples**
  - Five (5) from Building 85
  - One (1) from Building 87
- **Collect 2 Ambient Air Samples from Two Upwind Locations**
  - Assessed at Time Soil Gas and Indoor-Air Sampling is Conducted
- **Conduct Soil Gas and Indoor-Air Sampling for Two Events**
  - One (1) Dry Weather Event and One (1) Wet Weather Event
- **Evaluate Results for Additional Investigation / Remediation, As Warranted**

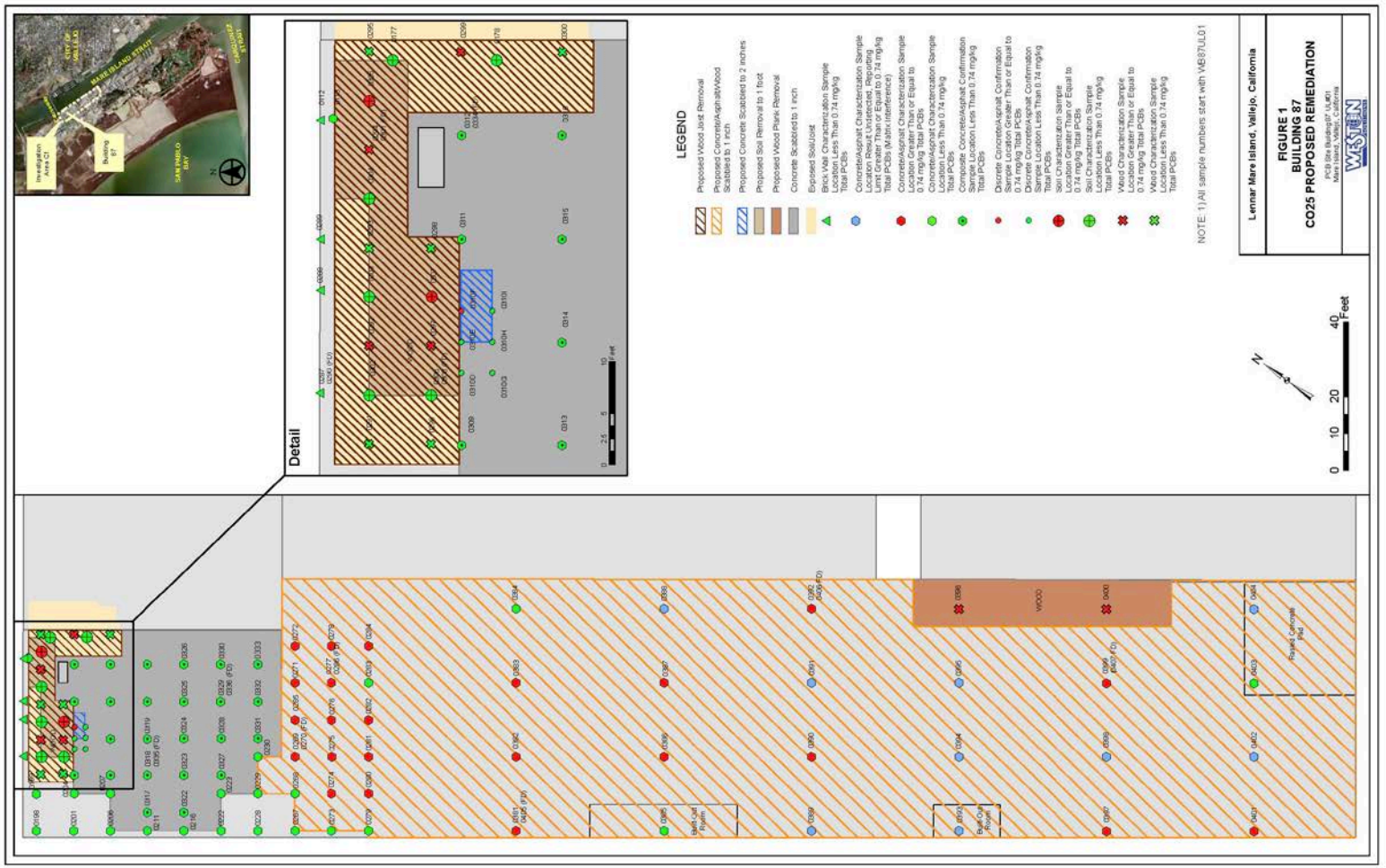
Upcoming Work (Continued)
Building 85/87 CVOCs in Soil Gas



Upcoming Work - Building PCB Site 87 UL#01

- **Remove 1,000 Square Feet of Wood Planks**
- **Remove 550 Square Feet of Wood Floor Joists**
- **Remove 260 Cubic Feet of Soil**
- **Scabble 20,000 Square Feet of Concrete / Asphalt**
- **Collect 92 Composite Concrete / Soil Confirmation Samples**
  - Each Consisting of 9-Point Discrete Samples Composited Together
- **Collect 7 Discrete Soil Confirmation Samples**
- **Offsite Disposal of 25 Twenty Cubic-Yard Roll-Off Bins**
  - Wood, Concrete, Asphalt, Soil, Debris and Dust
- **Evaluate Results for Additional Work, As Warranted**

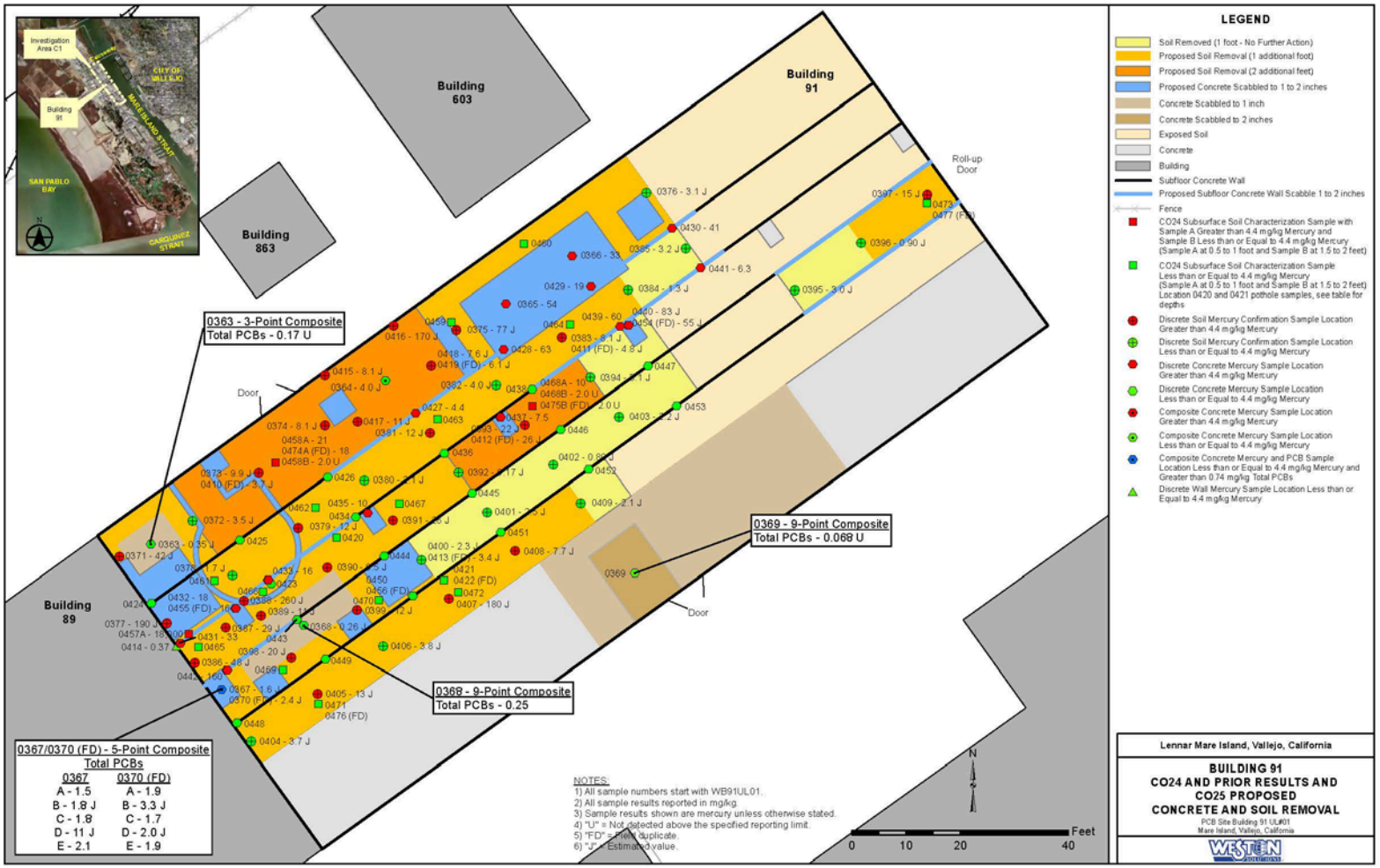
Upcoming Work (Continued) – Building PCB Site 87 UL#01



Upcoming Work – Building PCB Site 91 UL#01

- **Remove Approximately 5,200 Cubic Feet Soil (Mercury)**
- **Scabble Approximately 1,200 Square Feet of Concrete (Mercury)**
- **Remove Approximately 5 Square Feet of Concrete (PCBs in Stair – 4th Stair from Top)**
- **Remove Approximately 100 Square Feet of Concrete Sidewall (Mercury)**
- **Collect 39 Discrete Soil Confirmation Samples (Mercury)**
- **Collect 26 Discrete Concrete Confirmation Samples – Pads / Footers and Interior Walls (Mercury)**
- **Collect 24 Discrete Brick Confirmation Wall Samples (Mercury)**
- **Collect 4 Five-Point Concrete Composite Confirmation Samples – Circular Wall and Pads (Mercury)**
- **Collect 1 Five-Point Concrete Composite Confirmation Sample – Stairs (PCBs)**
- **Offsite Disposal of 25 Twenty Cubic-Yard Roll-Off Bins**
  - Concrete, Soil / Debris and Dust
- **Collect Indoor Air Samples for Mercury Vapor – Two Events**
  - One (1) Dry Weather Event and One (1) Wet Weather Event
- **Evaluate Results for Additional Work, As Warranted**

Upcoming Work (Continued) - Building PCB Site 91 UL#01 (PCBs and Mercury)



Questions?

Acronyms and Abbreviations

- **µg/m^3 – Micrograms per Cubic Meter of Air**
- **µg/100 cm^2 – Micrograms per One Hundred Square Centimeters**
- **IA – Investigation Area**
- **mg/kg – Milligrams per Kilogram**
- **PCB – Polychlorinated Biphenyl**
- **SVSL – Soil Vapor Screening Level**
- **TCE - Trichloroethene**
- **UL – Unknown Location**