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# BUNKER HILL SUPERFUND SITE 2023 BLOOD LEAD LEVELS

PANHANDLE HEALTH DISTRICT

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

**JUNE 5, 2024**



# PRESENTATION OUTLINE

- SITE HISTORY
- HEALTH EFFECTS OF LEAD
- LEAD HEALTH INTERVENTION PROGRAM (LHIP) BACKGROUND
- CLEANUP ACTIONS
- REMAINING EXPOSURES
- 2023 LHIP APPROACH
- 2023 LHIP RESULTS



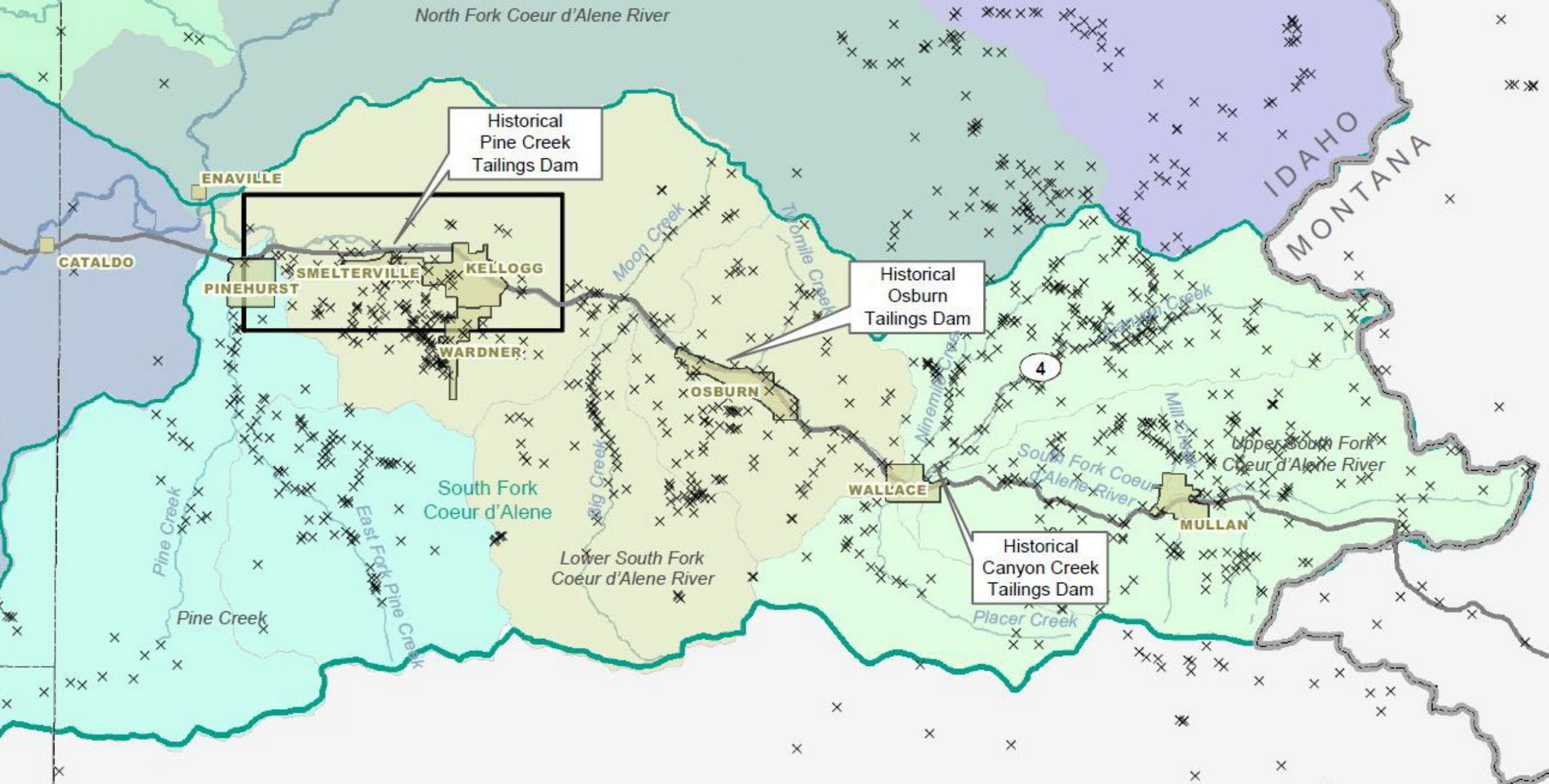
# HISTORY

- Hard rock mining began in the Silver Valley in 1884
- Area is mineral rich in Lead, Zinc, Silver, Arsenic, and Cadmium
- Historic mining, milling, and smelting practices did not take into consideration ecological or human health issues, which lead to widespread pollution of the area



Original Bunker Hill Mine Discovery in Milo Gulch 1897





Osburn Plank Dam 1920

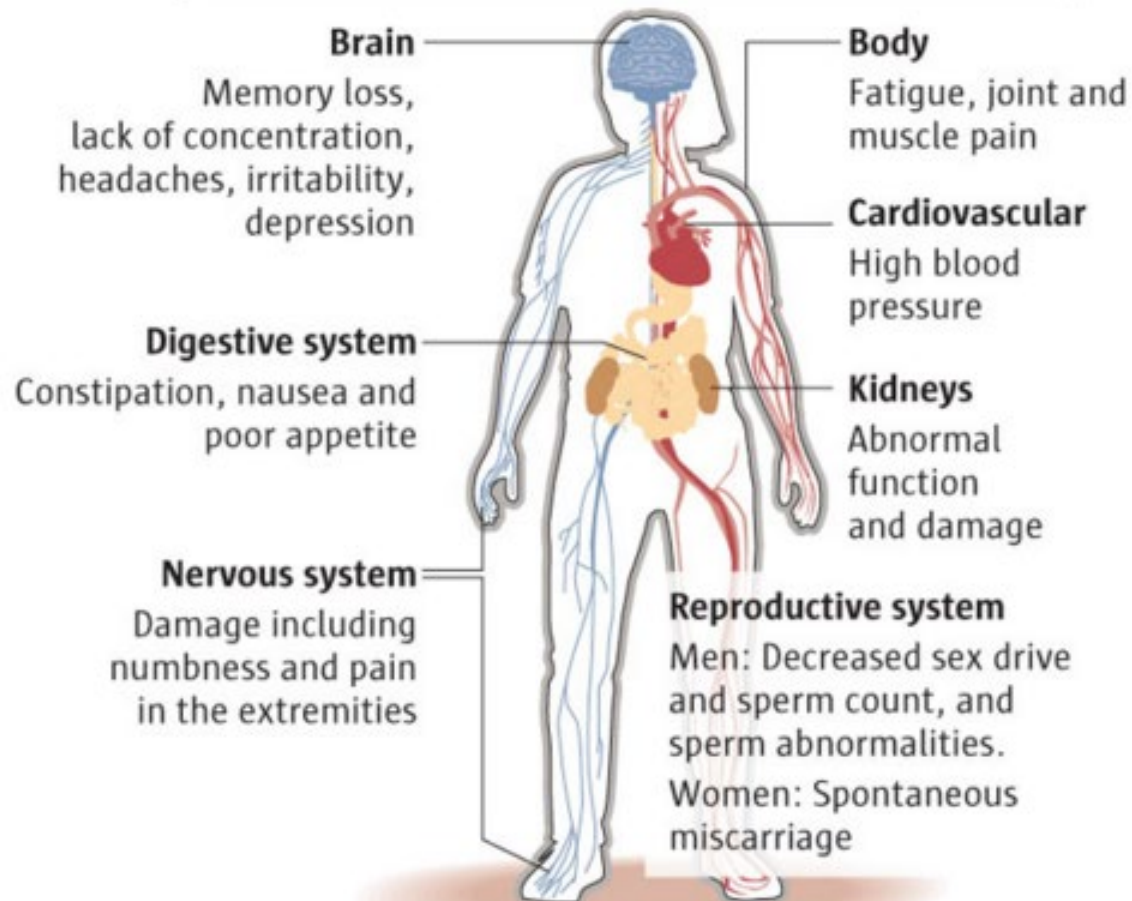




**Bunker Hill Lead Smelter**

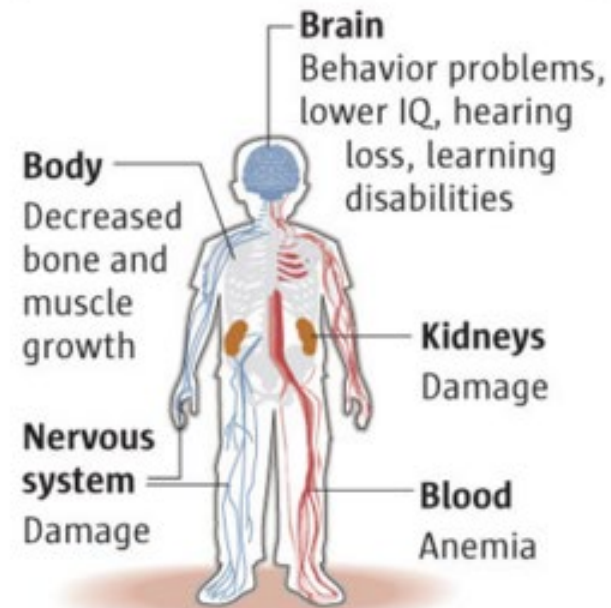
# HEALTH EFFECTS OF LEAD

## ADULTS

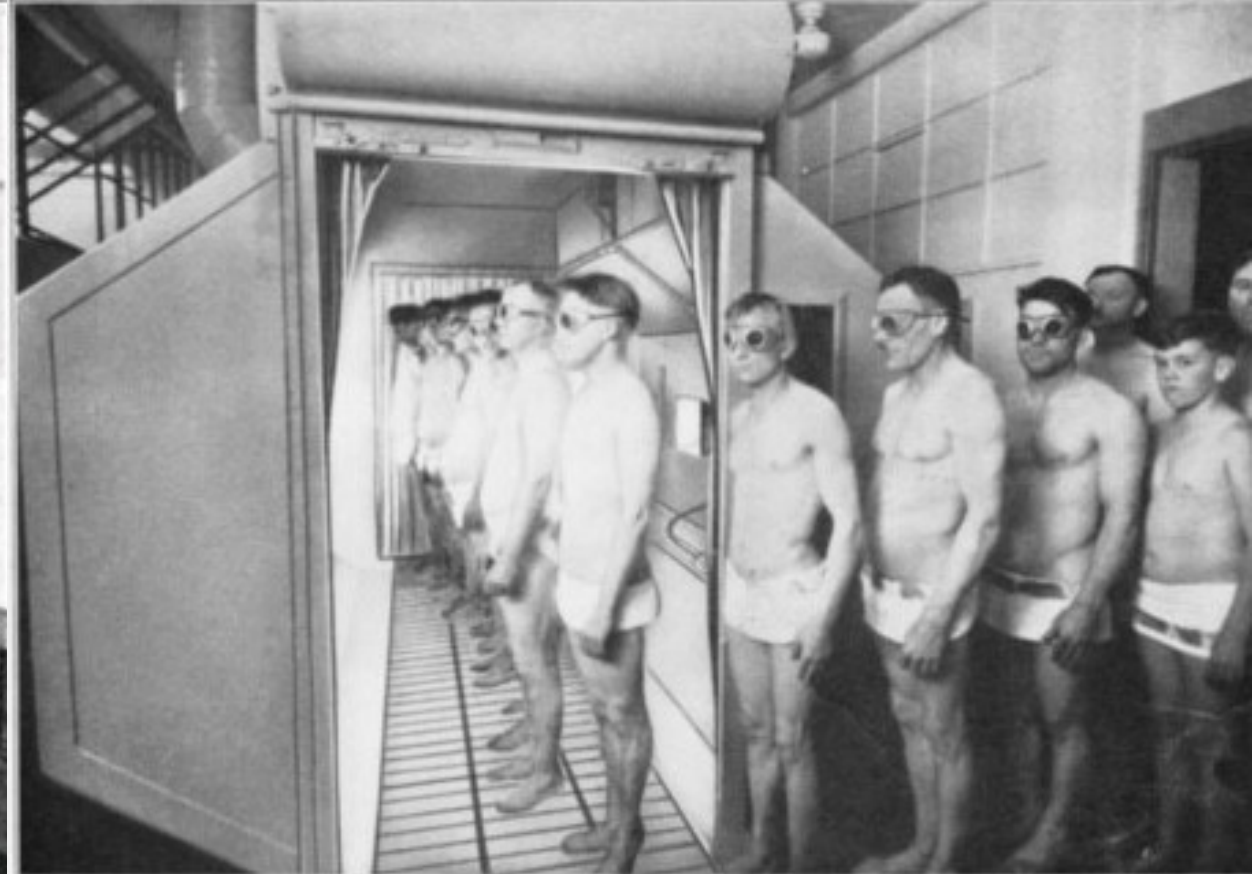


Most common exposure route:  
incidental ingestion

## CHILDREN

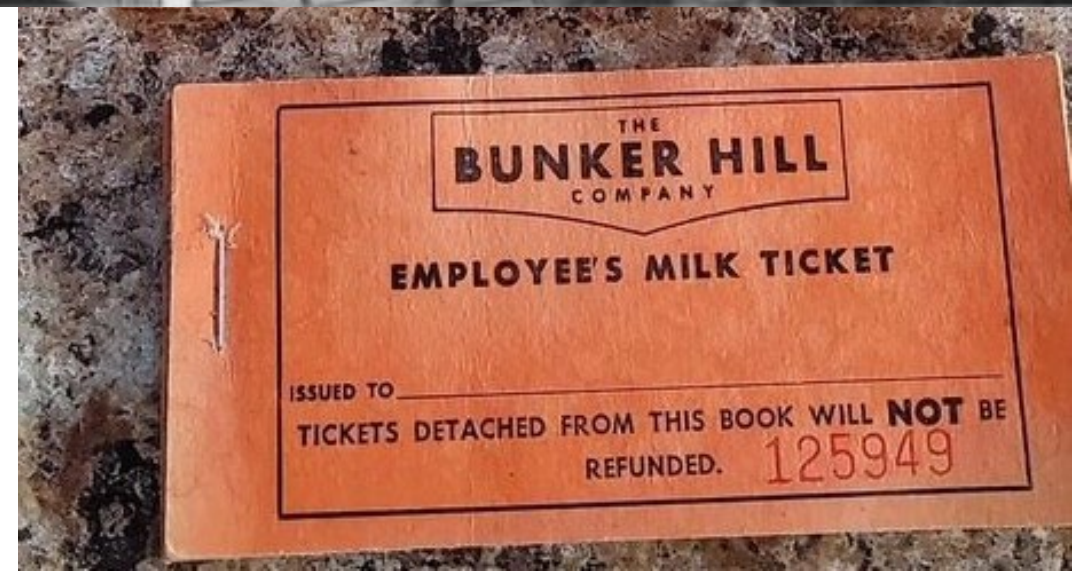






## Early Interventions

- Mining companies bought pollution easements
- Electrolytic Treatments (110 volt current)
- Sunrooms with weekly treatments for workers and area children
- Free Milk Program



## THE NEXT CHAPTER – RESPONDING TO THE PROBLEM

- In 1974 several children were hospitalized with clinical lead poisoning prompting epidemiologic & environmental investigations in the Box .
- It was found that 99% of children living within a mile of the Smelter had lead poisoning. Average blood lead level was 68.3  $\mu\text{g}/\text{dL}$  (CDC current reference value is  $\geq 3.5 \mu\text{g}/\text{dL}$ )
- The investigations revealed that smelting activities and historic mining practices were the cause of these elevated lead levels
- 1983 The Bunker Hill Superfund Site was placed on EPA's National Priorities List
- 1984 Remedial Investigation/Feasibility Studies began
- 1986 Cleanup efforts began

# LEAD HEALTH INTERVENTION PROGRAM (LHIP)

- LHIP began as joint effort between ATSDR, IDHW & PHD in 1974
- It has always been a public health service, not a study or experiment
- 1985 – PHD took over the program
- 1996 – PHD expanded the program into the Basin



# REMEDIATION

REMOVE THE CONTAMINATED MATERIALS & REPLACE THEM

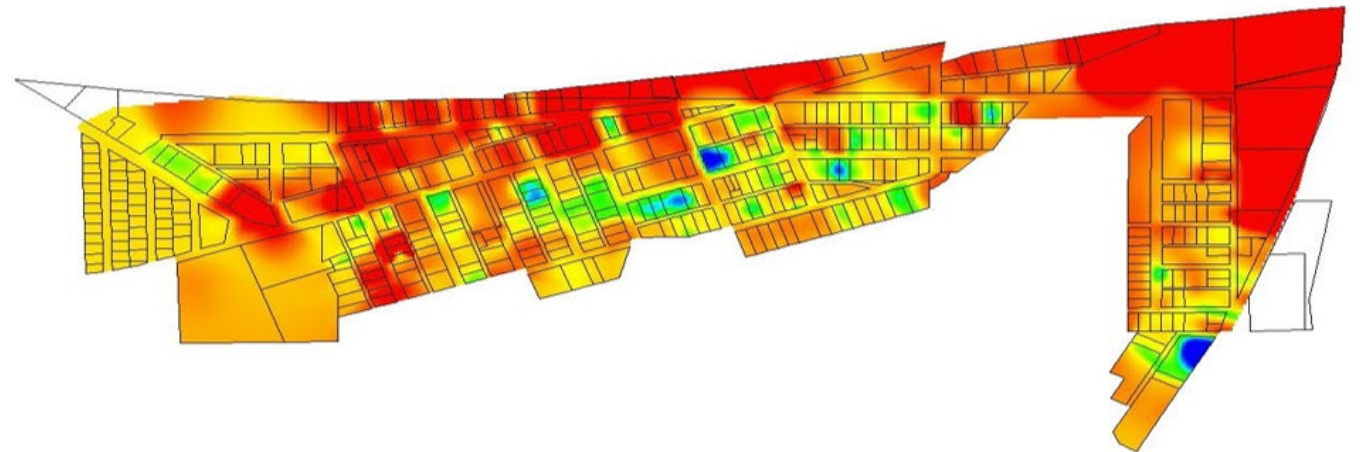
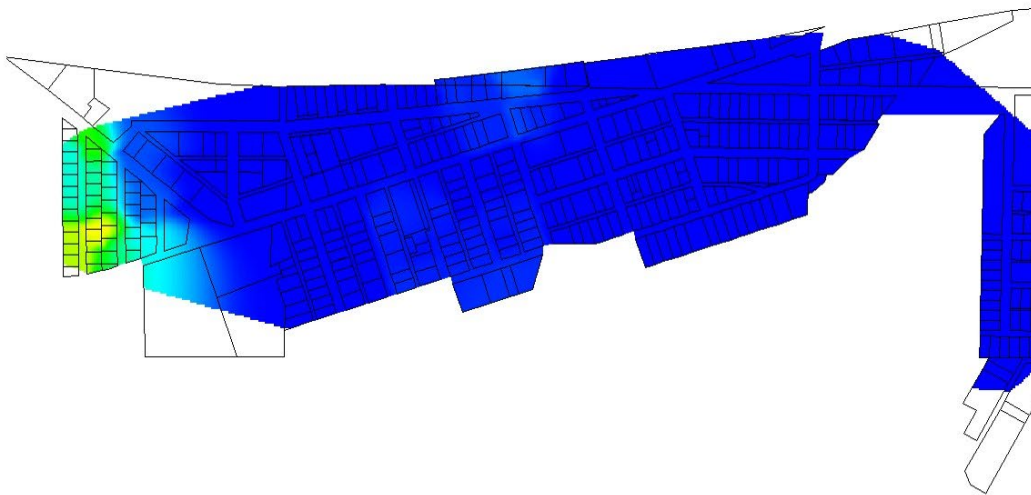
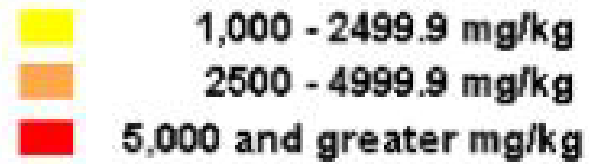
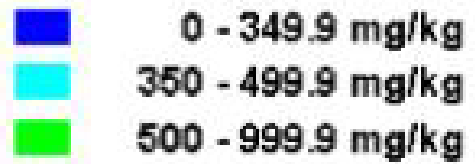


# REMEDIATION



- Only partial removals could be performed at the site
- Only yards that tested  $\geq 1000$  ppm lead were remediated
- Contaminated soils remain below the clean barriers
- Disturbed barriers can re-contaminate yards and expose children to contaminants

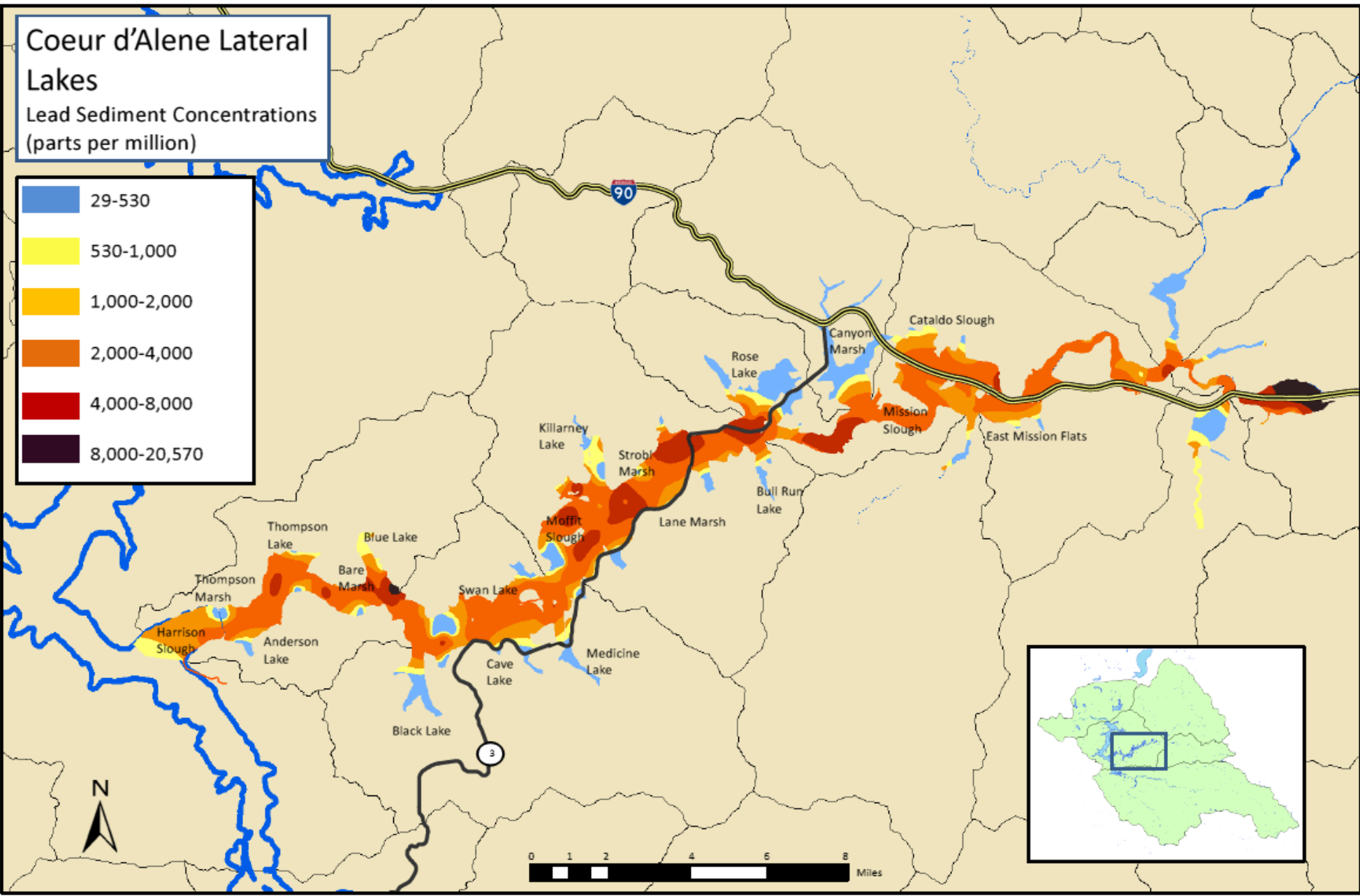
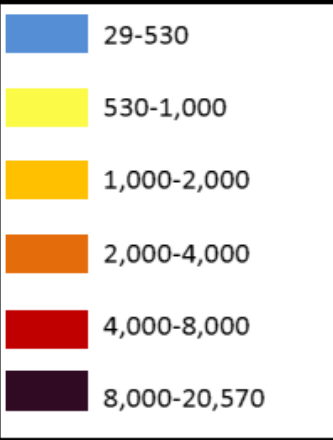
# LEAD CONCENTRATIONS BELOW REMEDIATED BARRIERS



# HILLSIDES AND UNDEVELOPED PROPERTIES



**Coeur d'Alene Lateral  
Lakes**  
Lead Sediment Concentrations  
(parts per million)



# Existing Lead Concentrations in the Lower Basin



# AT RISK POPULATIONS

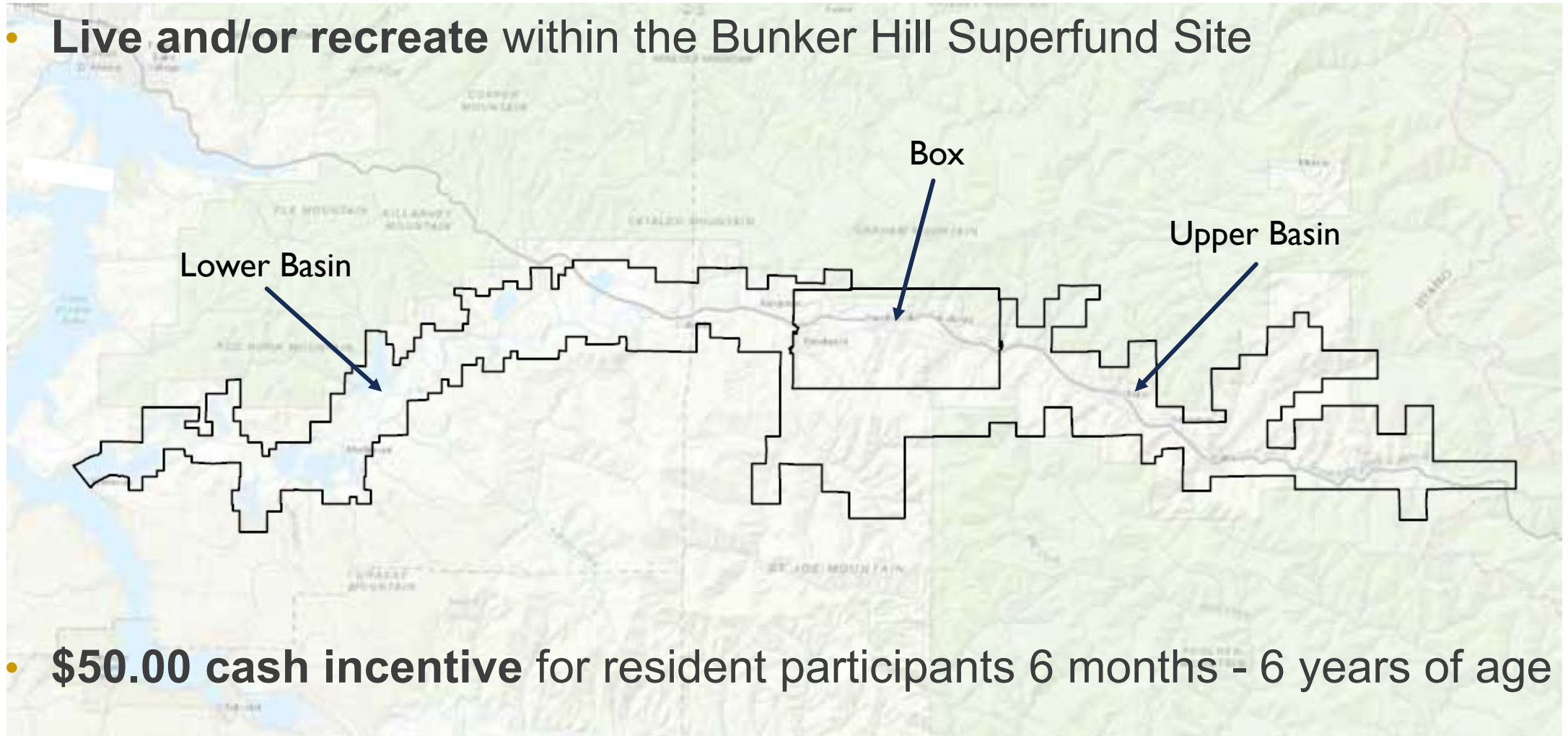


- Children
- Pregnant Women
- Adults with cumulative exposures



# LHIP PARTICIPANT CRITERIA & INCENTIVE

- **Live and/or recreate** within the Bunker Hill Superfund Site



- **\$50.00 cash incentive** for resident participants 6 months - 6 years of age

# 2023 LHIP APPROACH

- Informed consent
- Blood test offered by either
  - Venous, or
  - Capillary (i.e., fingerstick [FS])
- If FS  $\geq 3.5$   $\mu\text{g}/\text{dL}$  then venous confirmation test
- Free in-home investigation and follow up is offered for any children  $\geq 3.5$   $\mu\text{g}/\text{dL}$



# 2023 LHIP APPROACH



- Screening offered in August
  - Focus children 6 months – 6 years
- Additional screening events:
  - Walk-ins throughout the year
  - Kellogg Elk's Club Blood Drive, June 6
  - Shoshone Medical Center Kid's Health Fair, September 23 (incentive also provided)
  - Kellogg Elk's Club Blood Drive, October 3

# 2023 RESULTS IN “THE BOX”

OPERABLE UNITS (OU) 1 & 2



# 2023 BLOOD LEAD SUMMARY STATISTICS: BOX (AGE 6 MONTHS THROUGH 6 YEARS)

Total Number of Children (N)*	95
Minimum (µg/dL)	1
Maximum (µg/dL)	7
<b>Average (µg/dL)</b>	<b>2.0</b>
Standard Deviation	0.97
Geometric Mean (µg/dL)	1.8
Geometric Standard Deviation	1.5
Number / Percent Below Detection	59 (62%)

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	<b>Number*</b>	<b>Percentage*</b>
Children's blood lead $\geq$ 3.5 µg/dL	6	6%
Children's blood lead $\geq$ 5 µg/dL	3	3%
Children's blood lead $\geq$ 10 µg/dL	0	0%
Children's blood lead $\geq$ 15 µg/dL	0	0%

\*August event only.

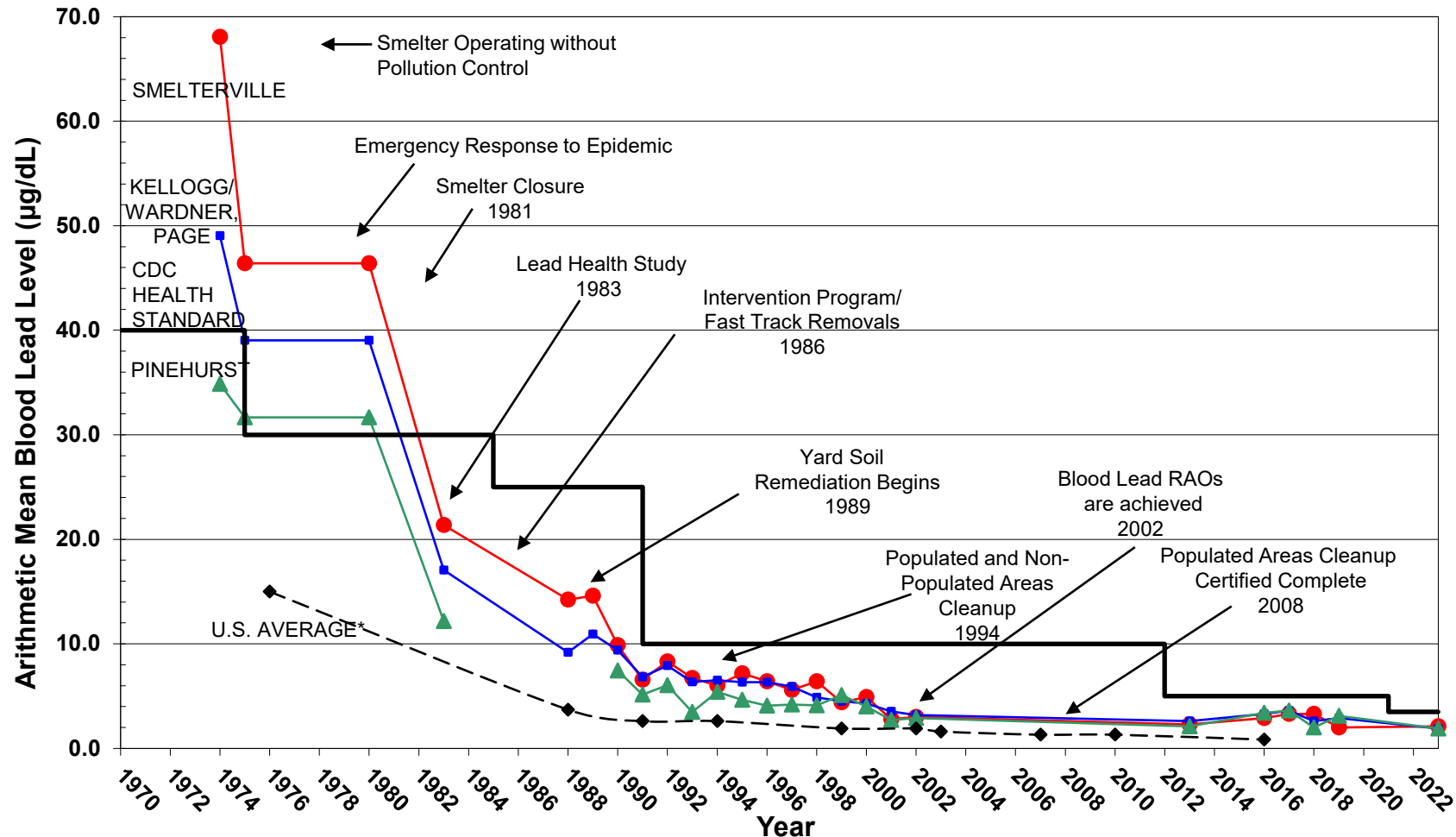
# 2023 BLOOD LEAD SUMMARY STATISTICS: BOX (OTHER NON-ELIGIBLE PARTICIPANTS)

Total Number of Participants (N)*	53
Minimum (µg/dL)	<1.4
Maximum (µg/dL)	21
Average (µg/dL)	<b>2.2</b>
Standard Deviation	2.9
Geometric Mean (µg/dL)	1.7
Geometric Standard Deviation	1.7
Number / Percent Below Detection	43 (81%)

	<b>Number *</b>	<b>Percentage *</b>
Blood lead $\geq$ 3.5 µg/dL	5	9%
Blood lead $\geq$ 5 µg/dL	4	8%
Blood lead $\geq$ 10 µg/dL	1	2%
Blood lead $\geq$ 15 µg/dL	1	2%

\*7+ years. August event only.

# BUNKER HILL BOX AVERAGE BLOOD LEAD: 1974-2023\*



\*not enough  
samples in  
2003-2012,  
2014, 2015,  
2020, & 2021

\*Ref.=(Mahaffey et al. 1982; Pirkle et al. 1994; Pirkle et al. 1998 ; Lofgren et al. 2000; CDC 2013)



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# 2023 RESULTS IN “THE BASIN”

OPERABLE UNIT (OU) 3



# 2023 BLOOD LEAD SUMMARY STATISTICS: BASIN (AGE 6 MONTHS THROUGH 6 YEARS)

Total Number of Children (N)*	94
Minimum (µg/dL)	1.0
Maximum (µg/dL)	7.0
<b>Average (µg/dL)</b>	<b>2.0</b>
Standard Deviation	1.1
Geometric Mean (µg/dL)	1.8
Geometric Standard Deviation	1.5
Number / Percent Below Detection	56 (60%)

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	<b>Number*</b>	<b>Percentage*</b>
Children's blood lead $\geq$ 3.5 µg/dL	8	9%
Children's blood lead $\geq$ 5 µg/dL	3	3%
Children's blood lead $\geq$ 10 µg/dL	0	0%

\* August event only.

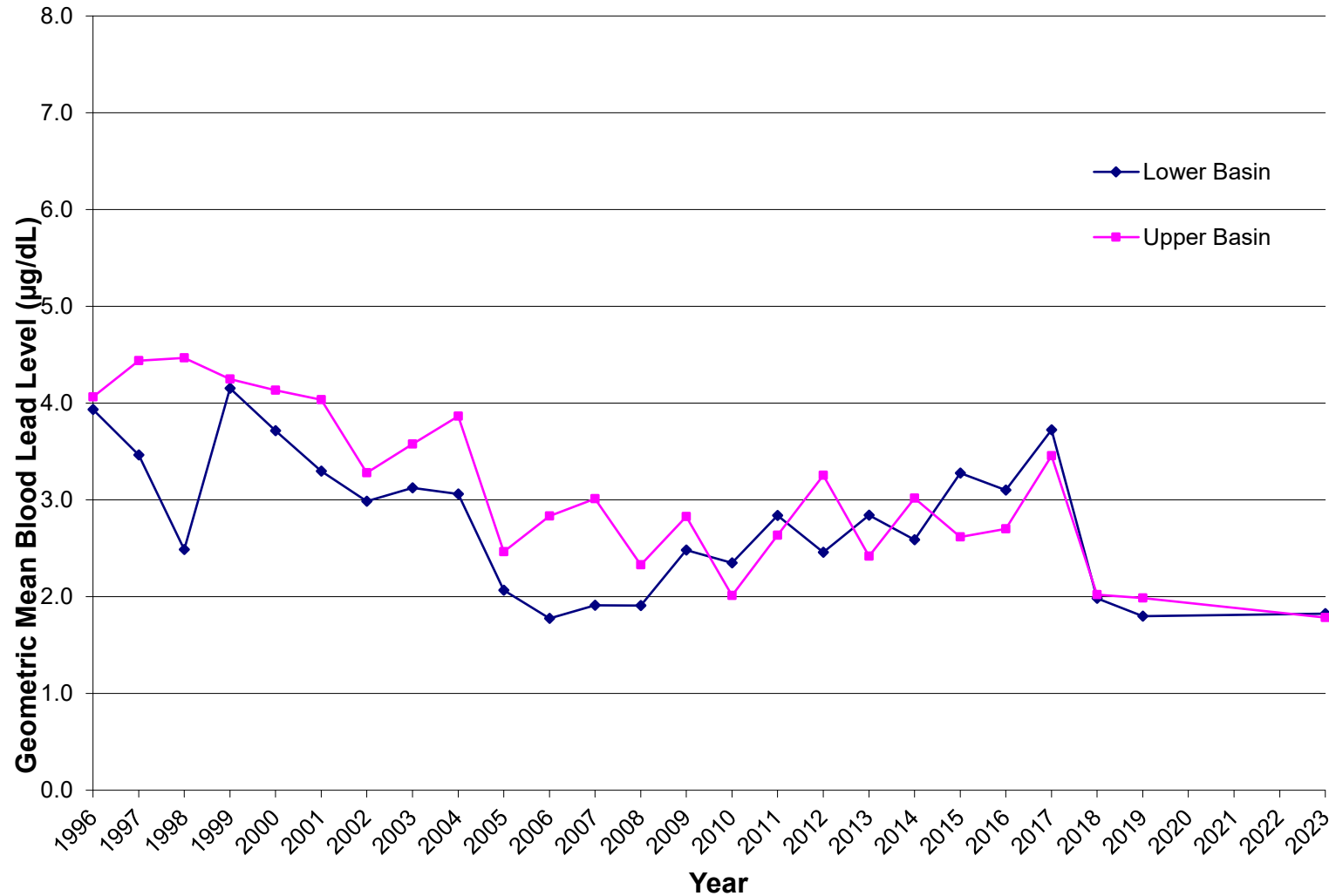
# 2023 BLOOD LEAD SUMMARY STATISTICS: BASIN (OTHER NON-ELIGIBLE PARTICIPANTS\*)

Total Number of Participants (N)*	50
Minimum (µg/dL)	<1.9
Maximum (µg/dL)	33
Average (µg/dL)	3.4
Standard Deviation	6.1
Geometric Mean (µg/dL)	1.9
Geometric Standard Deviation	2.2
Number / Percent Below Detection	41 (82%)

	<b>Number</b> *	<b>Percentage</b> *
Blood lead $\geq$ 3.5 µg/dL	6	12%
Blood lead $\geq$ 5 µg/dL	5	10%
Blood lead $\geq$ 10 µg/dL	5	10%
Blood lead $\geq$ 15 µg/dL	3	6%

\*7+ years. August event only. One resident outside the BHSS boundary participated and is not included above.  
Note: minimum value was less than (<) the detection limit.

# BASIN AVERAGE BLOOD LEAD LEVELS BY YEAR, 1996-2023\*



\*not enough samples in 2020-2022

# 2023 FOLLOW-UPS CONDUCTED (BOX & BASIN)

- In Home Investigations: 20
- Phone Consultations: 16
- Letters with additional information: 38

## Identified sources:

- Recreating in un-remediated areas
  - Additional outreach & follow safety tips to reduce exposure
- Occupational related
  - PHD worked with industries to provide education and provide tips on how to reduce exposure at work and reduce tracking
- Lead based paint
  - Conduct assessment & address if needed



# Eat healthy

## Calcium

- Milk
- Cheese
- Yogurt

## Vitamin C

- Oranges
- Kiwi
- Broccoli

## Iron

- Oatmeal
- Red meat
- Chicken



# PROTECT YOUR FAMILY FROM LEAD EXPOSURE



QUESTIONS?



# ESTIMATED 2023 LHIP PARTICIPATION RATES

	<b>Basin</b>	<b>Box</b>
Estimated Eligible Population <sup>a</sup>	493	330
Total No. of Eligible Population Providing Samples in 2023	94	95
<b>Estimated Percentage of Population Providing Samples</b>	<b>19%</b>	<b>29%</b>

<sup>a</sup> Eligible population is 6 month through 6 year old children living in the Box or Basin, based on estimates from 2018; these estimates are currently being updated.



# 2023 LHIP PARTICIPANTS & PROPERTY REMEDICATION STATUS

Property Remediation Status	Number of Children <sup>a</sup>	
	Basin	Box
No remedial action required or Remediated	86	87
Requires remediation or sampling	1	0
Not eligible for residential remediation program <sup>b</sup>	7	8
<b>Total</b>	<b>94</b>	<b>95</b>

<sup>a</sup> Eligible population is 6 month through 6 year old children living in the Box or Basin.

<sup>b</sup> Includes properties developed under the ICP and properties currently under development.