

Bunker Hill Superfund Site 2016 Blood Lead Levels

Panhandle Health District
Idaho Department of Environmental Quality
United States Environmental Protection Agency

2016

Lead Health Intervention Program (LHIP) Annual Blood Lead Surveys

- **Public health service offered by the State**
- **Not a study or experiment**
- **Box since 1974/1985**
- **Basin since 1996**

Panhandle Health District LHIP Procedures

- **Public health service offered to those that live within the Box or the Coeur d'Alene River Basin and are between 6 months and 6 years of age.**
- **\$30.00 cash incentive for participants.**
- **Prior to blood draws, the parent/legal guardian or adult participant must sign a Consent Form and complete the appropriate Questionnaire.**

Panhandle Health District LHIP Procedures

- **Screening blood test is done by skin puncture (capillary or fingerstick - FS)**
- **Results of capillary test are provided to the participant or parent immediately after analysis**
- **All FS results over 5 $\mu\text{g}/\text{dL}$ are followed up with a venous draw conformation test**
- **Offer consultations and follow-up with all children who test over 5 $\mu\text{g}/\text{dL}$**

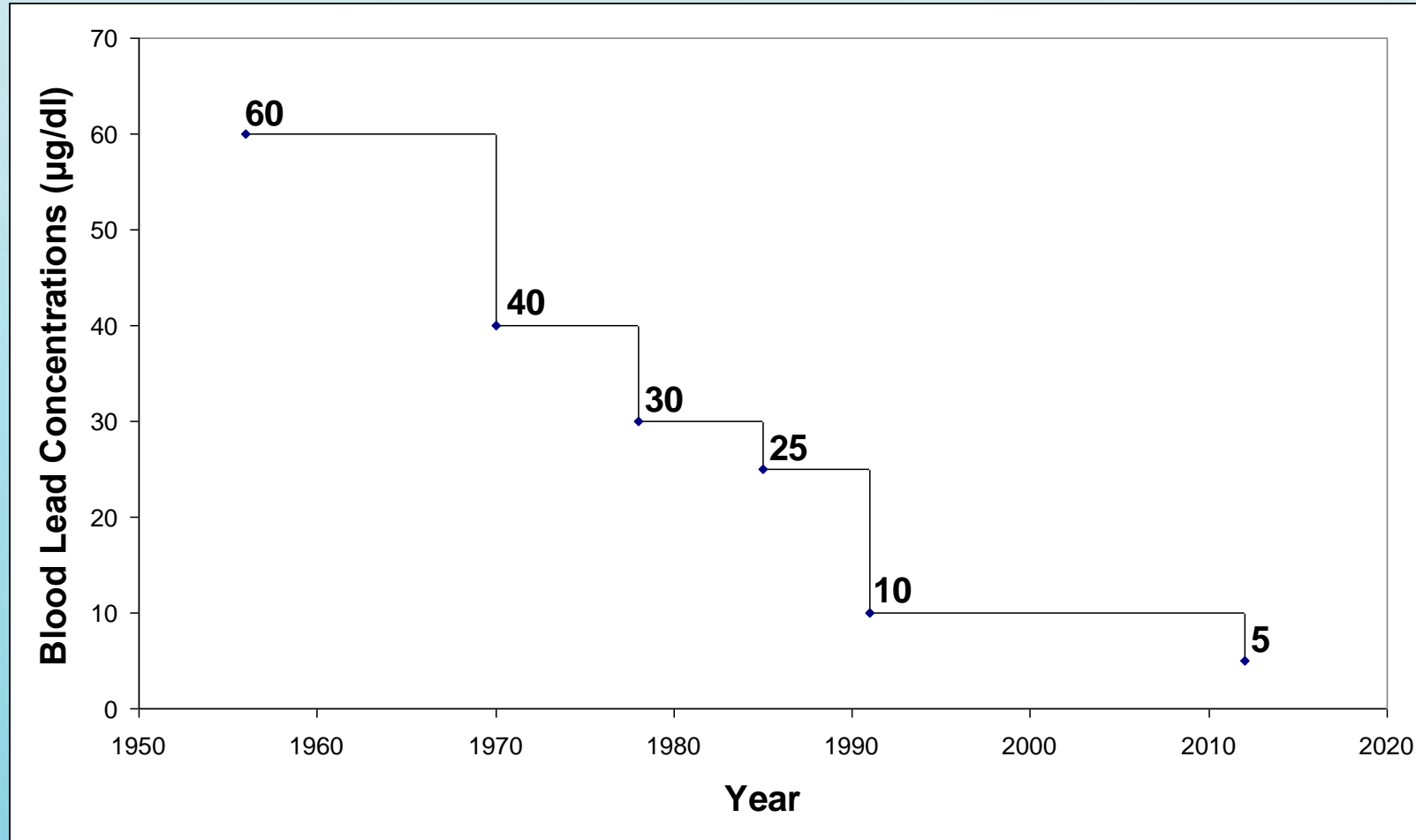
A scenic landscape featuring a calm lake in the foreground, reflecting the surrounding environment. In the background, there are rolling mountains and hills, some covered in green vegetation. The entire scene is overlaid with a soft, blue-to-teal gradient that fades from the top to the bottom, creating a serene and atmospheric effect.

Health Effects

“ The health effects associated with lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in the body, especially the nervous system. No safe level of lead exposure has been identified.”

– Centers for Disease Control and Prevention

Decreasing “elevated” blood lead levels



Blood Lead Concentrations Considered to be Elevated by the Centers for Disease Control and Prevention.

*N Engl J Med 2003; 348: p1517-26 (1950 – 1991)

*CDC. Recommendations in “*Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention*”. (2012)

Route of Exposure

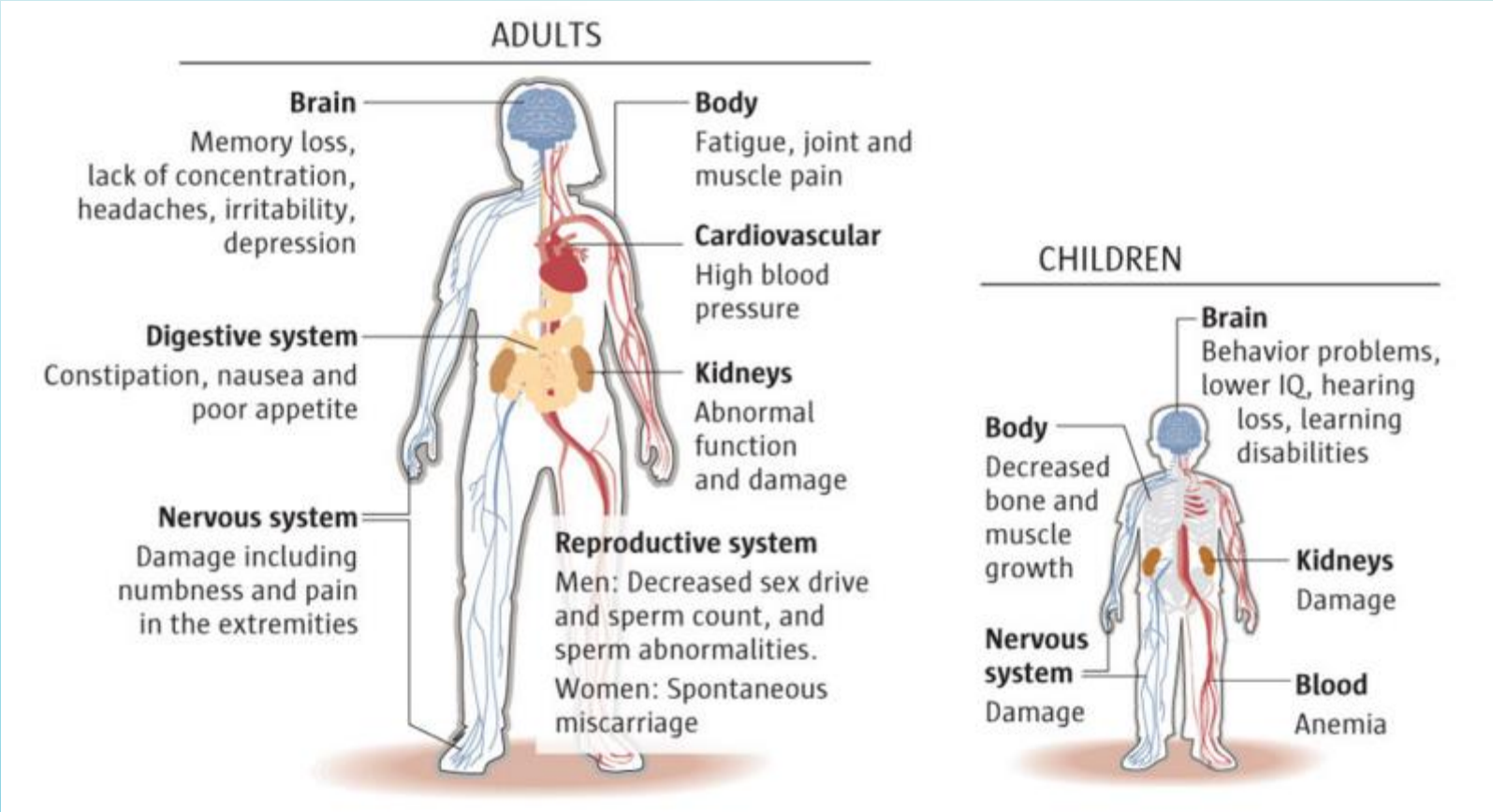
- Ingestion – Most common exposure route. Absorption rate of 20-60% (ATSDR 2007)
- Inhalation – Almost all lead that is deposited in the lungs is absorbed into the body (ATSDR 2007)
- Blood serves as the initial receptacle of absorbed lead and essentially distributes throughout the body. Making it available to all soft tissue organs.

Reference: Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological profile for Lead. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

At Risk Populations


- Children – more affected by lead due to behavior & physiology
- Pregnant women – Readily crosses the placenta adversely affecting fetus
- Adults with cumulative exposure – Generally occupational or hobby related
- Genetically pre-disposed individuals

Health Effects



Health Effects – Children vs. Adults

- Children suffer effects from lead exposure at much lower levels
- No safe blood lead threshold for the adverse effects of lead on infant or child neurodevelopment has been identified
- Latent effects of lead exposure during childhood for adults
- Because lead exposure often occurs with no obvious symptoms, it frequently goes unrecognized
- A blood lead test is the best tool for identifying lead exposure

A serene landscape featuring a calm lake in the foreground, reflecting the surrounding environment. In the middle ground, there is a dense forest of evergreen trees. The background consists of misty, rolling mountains under a soft, hazy sky. The overall color palette is dominated by cool blues, greens, and greys, creating a peaceful and atmospheric scene. The word "Box" is superimposed on the left side of the image in a bold, blue, sans-serif font.

Box

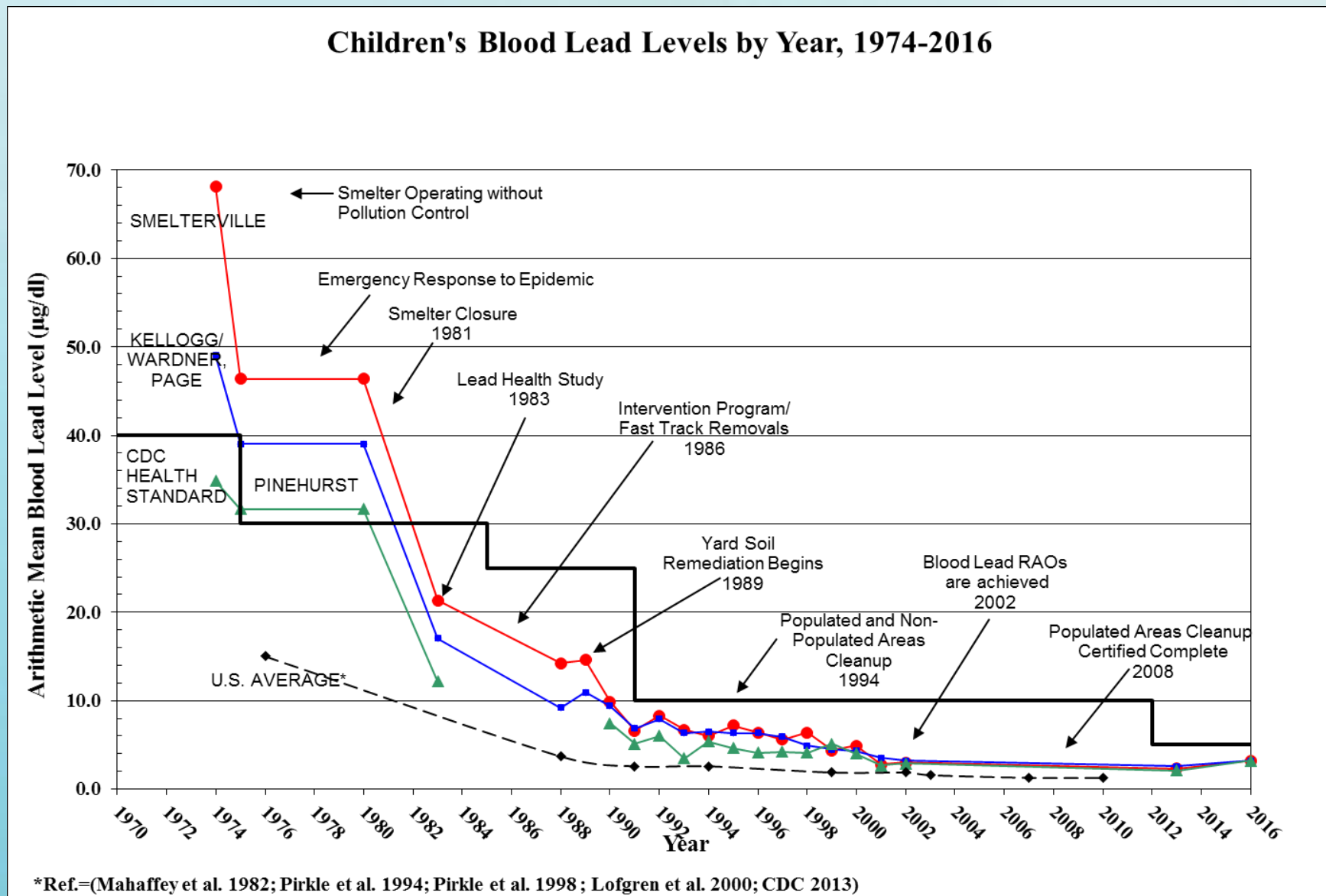
Box

Remedial Action Objectives

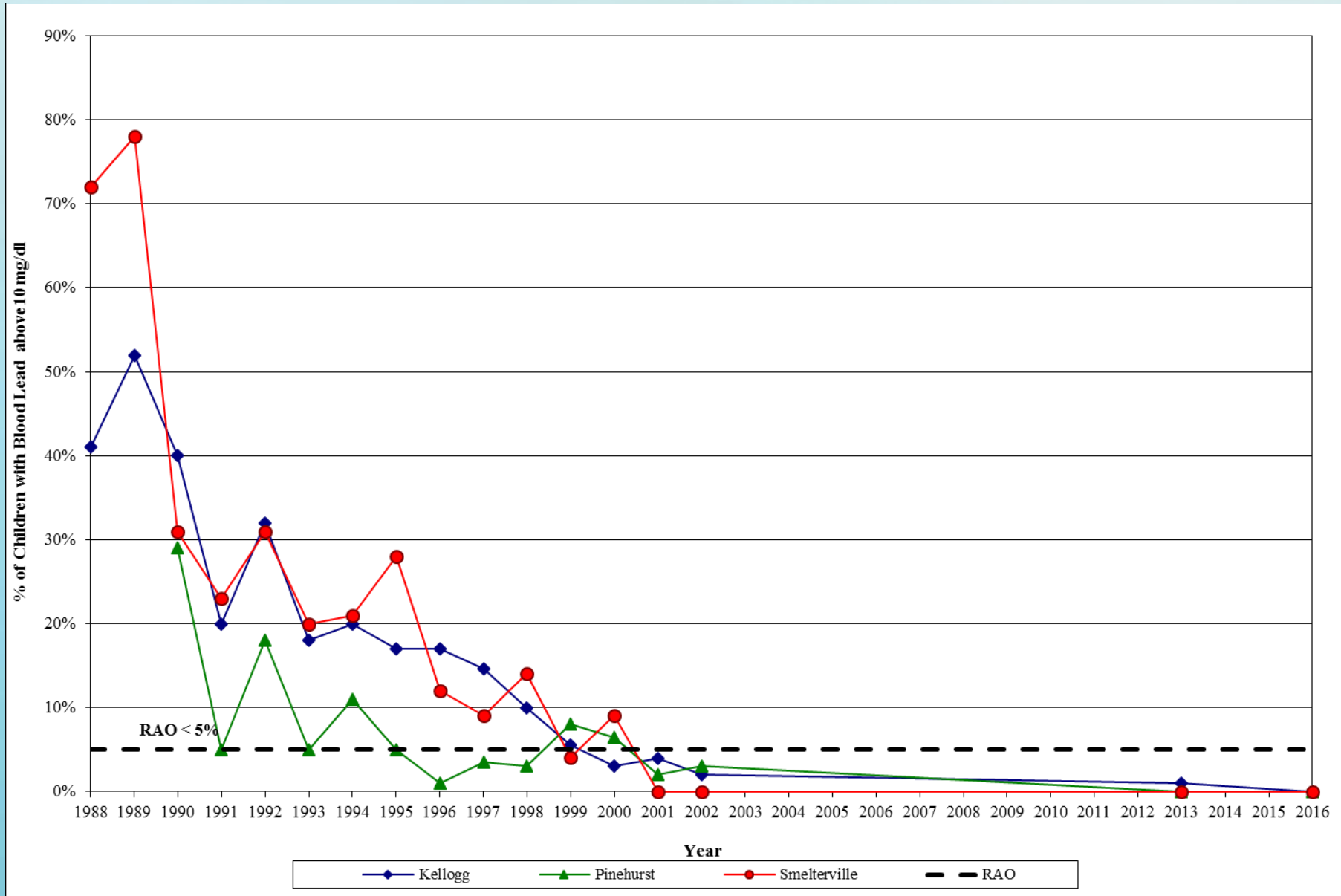
- No more than 5% of children in each community have blood lead levels $\geq 10 \mu\text{g/dL}$
- Less than 1% with blood lead levels $\geq 15 \mu\text{g/dL}$

Bunker Hill Box

Average Blood Lead: 1974-2016



Percent of Box Children with Blood Lead Levels $\geq 10 \mu\text{g/dL}$, by City, 1988-2015



2016 Blood Lead Summary Statistics – Box (age 0-6)

Total Number of Children (N)	114
Minimum ($\mu\text{g}/\text{dL}$)	1.4
Maximum ($\mu\text{g}/\text{dL}$)	9.0
Average ($\mu\text{g}/\text{dL}$)	3.2
Standard Deviation	1.4
Geometric Mean ($\mu\text{g}/\text{dL}$)	3.0
Geometric Standard Deviation	1.5

	Number	Percentage
Children's blood lead $\geq 5 \mu\text{g}/\text{dL}$	9	8%
Children's blood lead $\geq 10 \mu\text{g}/\text{dL}$	0	0%
Children's blood lead $\geq 15 \mu\text{g}/\text{dL}$	0	0%

2016 Blood Lead Summary

Statistics – Box (other non-eligible children*)

Total Number of Children (N)	18
Minimum ($\mu\text{g/dL}$)	1.4
Maximum ($\mu\text{g/dL}$)	4.0
Average ($\mu\text{g/dL}$)	2.3
Standard Deviation	1.1
Geometric Mean ($\mu\text{g/dL}$)	2.1
Geometric Standard Deviation	1.6

	Number	Percentage
Children's blood lead $\geq 5 \mu\text{g/dL}$	0	0%
Children's blood lead $\geq 10 \mu\text{g/dL}$	0	0%
Children's blood lead $\geq 15 \mu\text{g/dL}$	0	0%

*aged 7-15 years

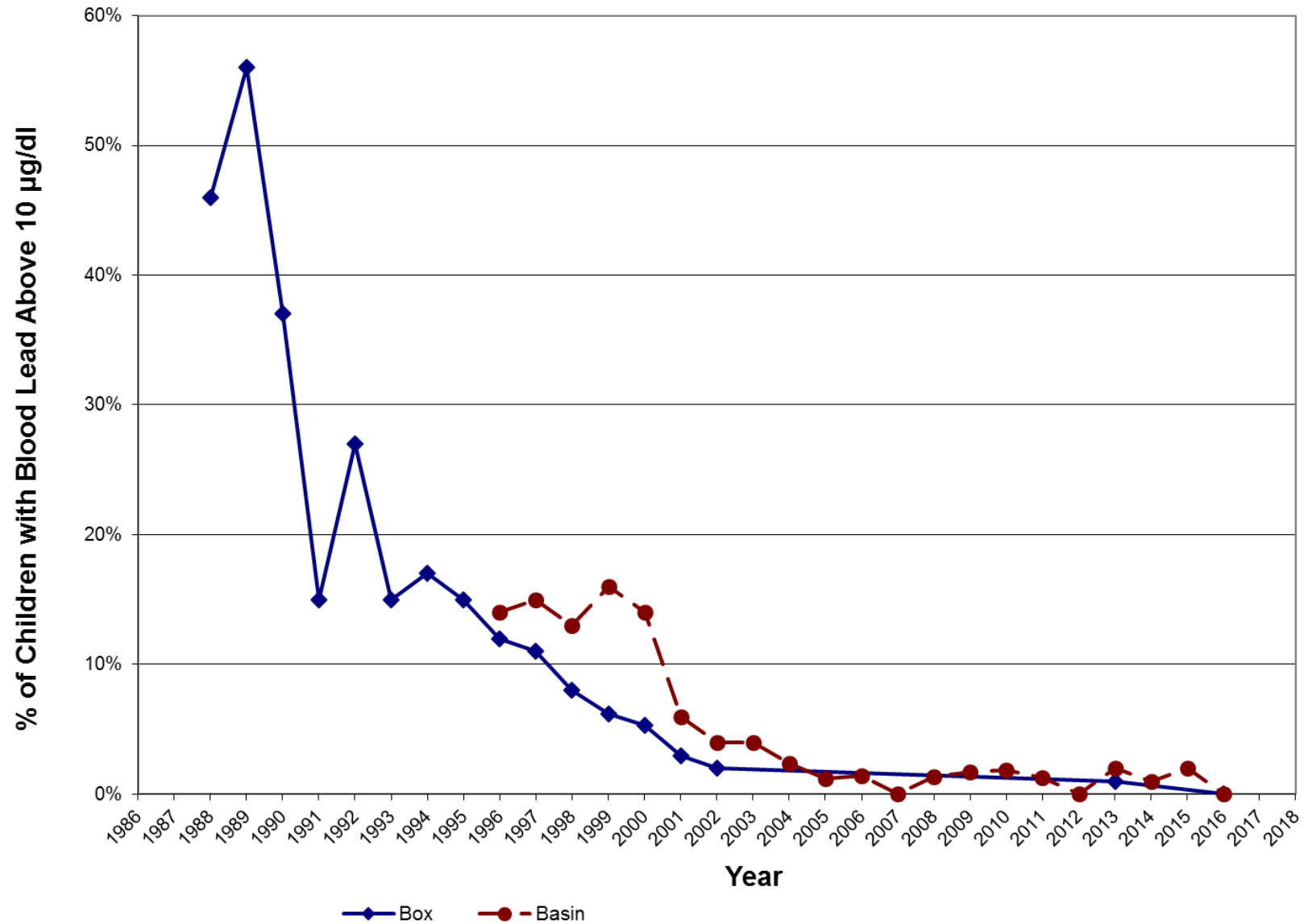
A scenic landscape featuring a calm lake in the foreground, reflecting the surrounding environment. In the middle ground, there is a dense forest of evergreen trees. The background consists of misty, rolling mountains under a soft, hazy sky. The overall color palette is dominated by light blues, greens, and whites, creating a serene and atmospheric mood. The word "Basin" is overlaid on the left side of the image in a bold, blue, sans-serif font.

Basin

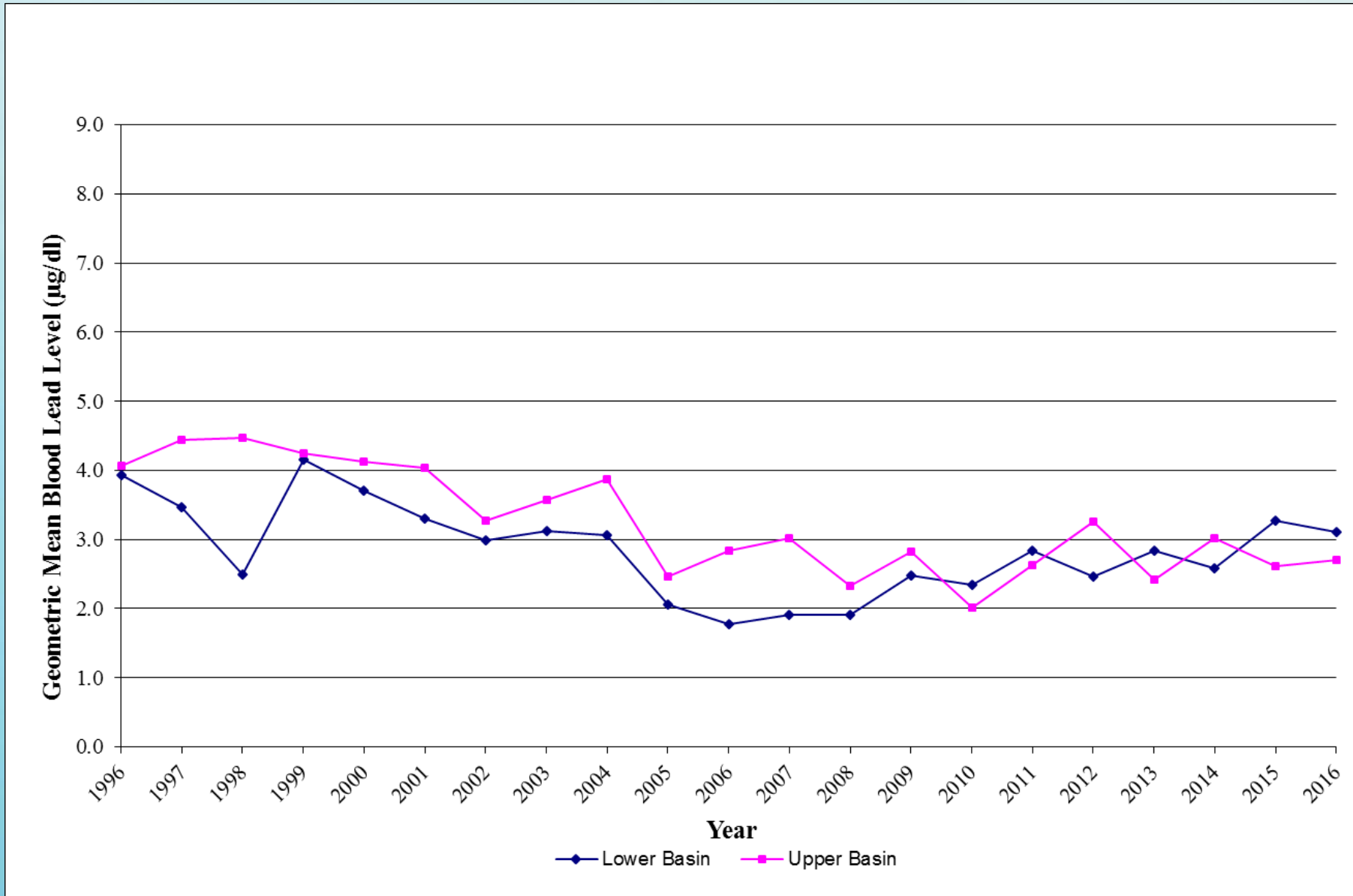
Basin Remedial Action Objectives

- Reduce exposures to soils with concentrations greater than risk-based levels
 - Lead: ≥ 700 mg/kg
 - Arsenic: ≥ 100 mg/kg
- Reduce exposures to lead in house dust
- Cumulative exposures do not exceed USEPA's health risk goals
 - Lead: <5% chance that a typical child at an individual residence does not exceed 10 $\mu\text{g}/\text{dL}$

Percent of Children with Blood Lead Levels $\geq 10 \mu\text{g/dl}$, Box and Basin, 1988-2016



Basin Blood Lead Levels, by Year, 1996-2016



2016 Blood Lead Summary Statistics – Basin (age 0-6)

Total Number of Children (N)	70
Minimum ($\mu\text{g}/\text{dL}$)	1.4
Maximum ($\mu\text{g}/\text{dL}$)	9.0
Average ($\mu\text{g}/\text{dL}$)	3.2
Standard Deviation	1.6
Geometric Mean ($\mu\text{g}/\text{dL}$)	2.9
Geometric Standard Deviation	1.6

	Number	Percentage
Children's blood lead $\geq 5 \mu\text{g}/\text{dL}$	8	11%
Children's blood lead $\geq 10 \mu\text{g}/\text{dL}$	0	0%
Children's blood lead $\geq 15 \mu\text{g}/\text{dL}$	0	0%

2016 Blood Lead Summary

Statistics – Basin (Pregnant Women)

Total Number (N)	4
Minimum ($\mu\text{g/dL}$)	1.4
Maximum ($\mu\text{g/dL}$)	2.3
Average ($\mu\text{g/dL}$)	1.6
Standard Deviation	0.5
Geometric Mean ($\mu\text{g/dL}$)	1.6
Geometric Standard Deviation	1.3

	Number	Percentage
Blood lead $\geq 5 \mu\text{g/dL}$	0	0%
Blood lead $\geq 10 \mu\text{g/dL}$	0	0%
Blood lead $\geq 15 \mu\text{g/dL}$	0	0%

2016 Blood Lead Summary

Statistics – Basin (other non-eligible children*)

Total Number (N)	28
Minimum ($\mu\text{g}/\text{dL}$)	1.4
Maximum ($\mu\text{g}/\text{dL}$)	10.0
Average ($\mu\text{g}/\text{dL}$)	2.4
Standard Deviation	2.2
Geometric Mean ($\mu\text{g}/\text{dL}$)	2.0
Geometric Standard Deviation	1.7

	Number	Percentage
Blood lead $\geq 5 \mu\text{g}/\text{dL}$	2	7%
Blood lead $\geq 10 \mu\text{g}/\text{dL}$	1	3%
Blood lead $\geq 15 \mu\text{g}/\text{dL}$	0	0%

*aged 0 -13 years. Nine children younger than 7 years of age were tested before or after the LHIP.