



Risk

- Risk Depends on:
 - Exposure
 - Toxicity



Exposure

- How can you be exposed to PCBs?
 - Ingestion
 - Inhalation
 - Dermal Absorption
- Primary Exposure Route at NBH:
 - Fish Consumption



Exposure

- How much exposure depends on:
 - Concentration in fish, air etc.
 - Frequency of Exposure, for example:
 - Fish – number of meals per year
 - Air – number of hours, days of exposure
 - Duration of Exposure
 - Number of years



Toxicity

- Cancer effects
 - Probability of cancer
 - For example, 1 in 100,000
- Noncancer effects
 - Comparison to a health-based reference level



Cancer Risk

- Increased probability of getting cancer over a lifetime from exposure to site
- Cancer slope factor \times exposure dose
- EPA Risk Range
 - 1 in a million to 1 in ten thousand chance
 - 1 in 1,000,000 to 1 in 10,000
 - 1E-06 to 1E-04
 - 1×10^{-6} to 1×10^{-4}



Noncancer Hazard

- Compares site exposure to level without appreciable risk
- Hazard Index = $\frac{\text{Site Exposure}}{\text{Reference Dose}}$
- $HI \leq 1$, adverse effect unlikely



Risk-based Air Concentrations

- Resident
 - Child and Adult
 - 24 hours per day
 - 350 days per year

- Worker in Commercial Areas
 - Adults
 - 24 hours per day
 - 250 days per year



Risk-based Air Concentrations

Residential Areas

- Noncancer effects
 - 110 ng/m³
- Cancer Risk (1×10^{-5})
 - 409 ng/m³

Commercial Areas

- Noncancer effects
 - 260 ng/m³
- Cancer Risk (1×10^{-5})
 - 894 ng/m³



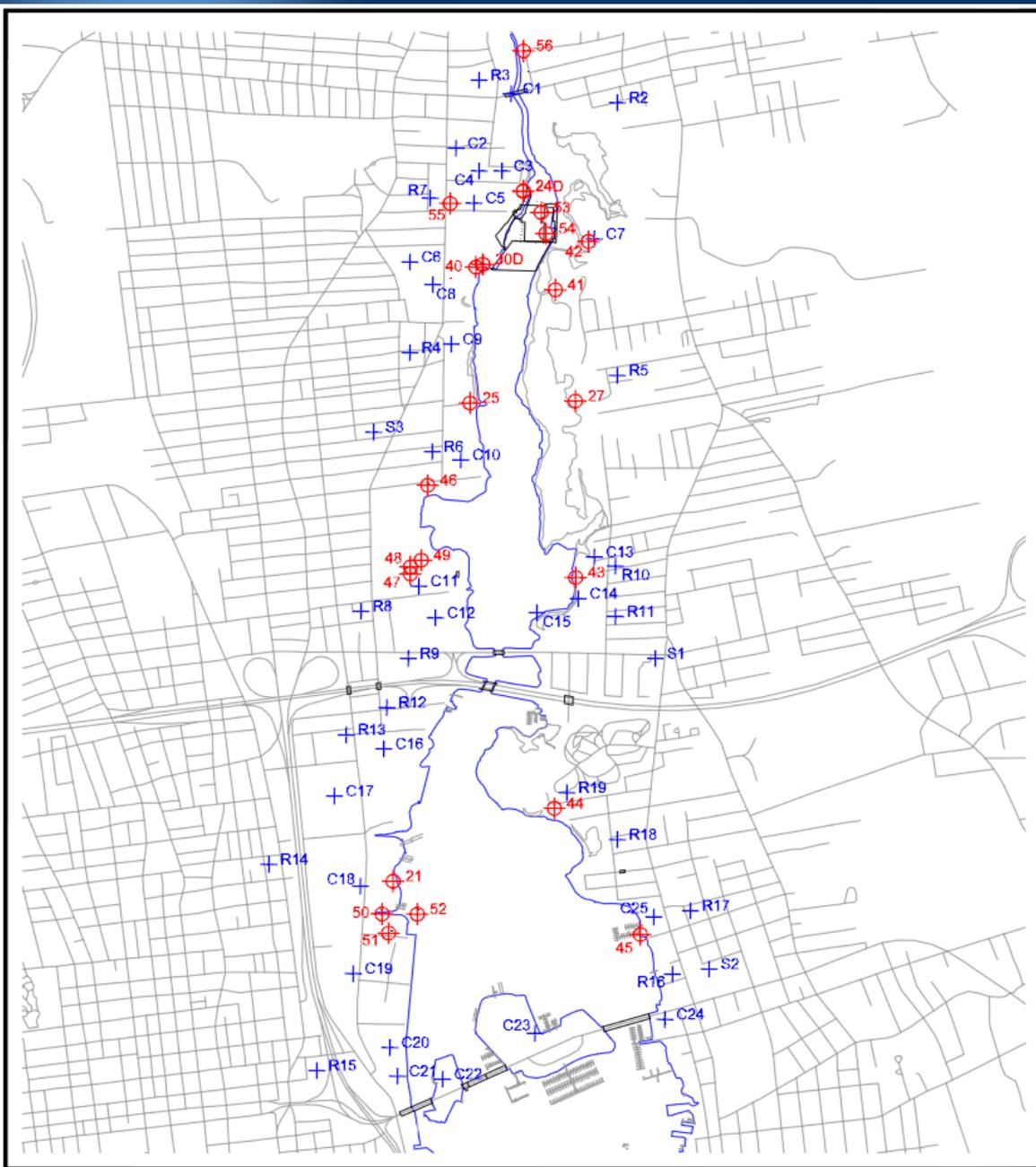
Comparison of Modeled and Risk-Based Air Concentrations

Modeled Annual Averages

- **Residential**
 - CAD Activity - 0.207 ng/m³
 - All sources - 4.765 ng/m³
- **Commercial**
 - CAD Activity - 1.488 ng/m³
 - All sources – 32.754 ng/m³

Risk-Based Concentrations

- **Residential**
 - 110 ng/m³
 - 409 ng/m³
- **Commercial**
 - 260 ng/m³
 - 894 ng/m³



Monitoring Locations

And Receptors

-  Air Monitoring Station
-  Discrete Receptors

Comparison of Cancer Risks

