

Indiana Harbor and Canal Ambient Air Monitoring Update

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Air Monitoring at IHC History

- **Started in 2001**
- **Originally 4 CDF site locations plus High School site.**
- **2 types of air monitors used, three monitors at each site**
- **Sample once every 6 days, each sample is 24 hour duration**
- **Purpose of monitoring was to collect baseline air quality data, and to determine if construction activities were causing impacts to air quality.**



Monitoring Parameters

- **62 chemical compounds measured in air including**
 - **Volatile Organic Compounds**
 - **Polycyclic Aromatic Hydrocarbon Compounds**
 - **PCBs**
 - **Total Suspended Particulates**
 - **Metals**
- **Compounds found in the sediment that could become air pollutants**
- **No health-based National Ambient Air Quality Standards exist for these pollutants**
- **Sources include**
 - **Industry, cars, buses, cigarette smoke, household chemicals**



Original Monitoring Locations



Air Monitors



Initial Findings, November 2003

- **Less than half of the compounds were measurable in the air.**
- **Air compounds were not higher at the ECI site and High School during construction at the ECI site.**
- **The four sample locations at the ECI site were found to be statistically similar, so only one site (the south site) was used for subsequent monitoring. The High School site is also still used.**



Current Air Monitoring

- Two monitoring locations (south side of ECI site, East Chicago High School)
- Sample once every 6 days
- Same 62 parameters
- Information posted on internet at:

<https://web.ead.anl.gov/inharbor/data/analysis/publicTables/index.cfm?pop=1>

Also reach through the project website:

http://www.lrc.usace.army.mil/projects/IN_harbor_canal_CDF/index.html

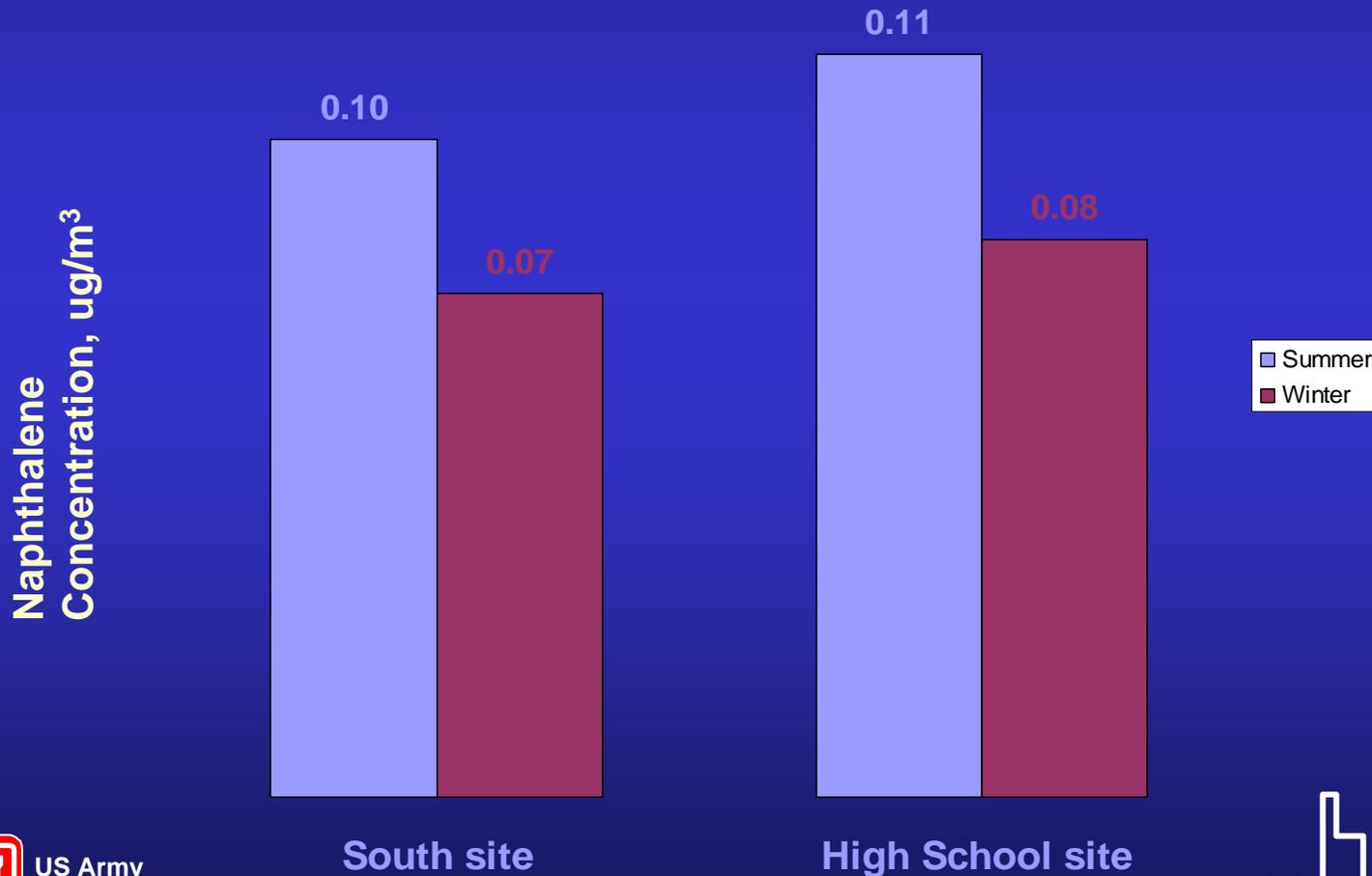


Current Air Monitoring Locations

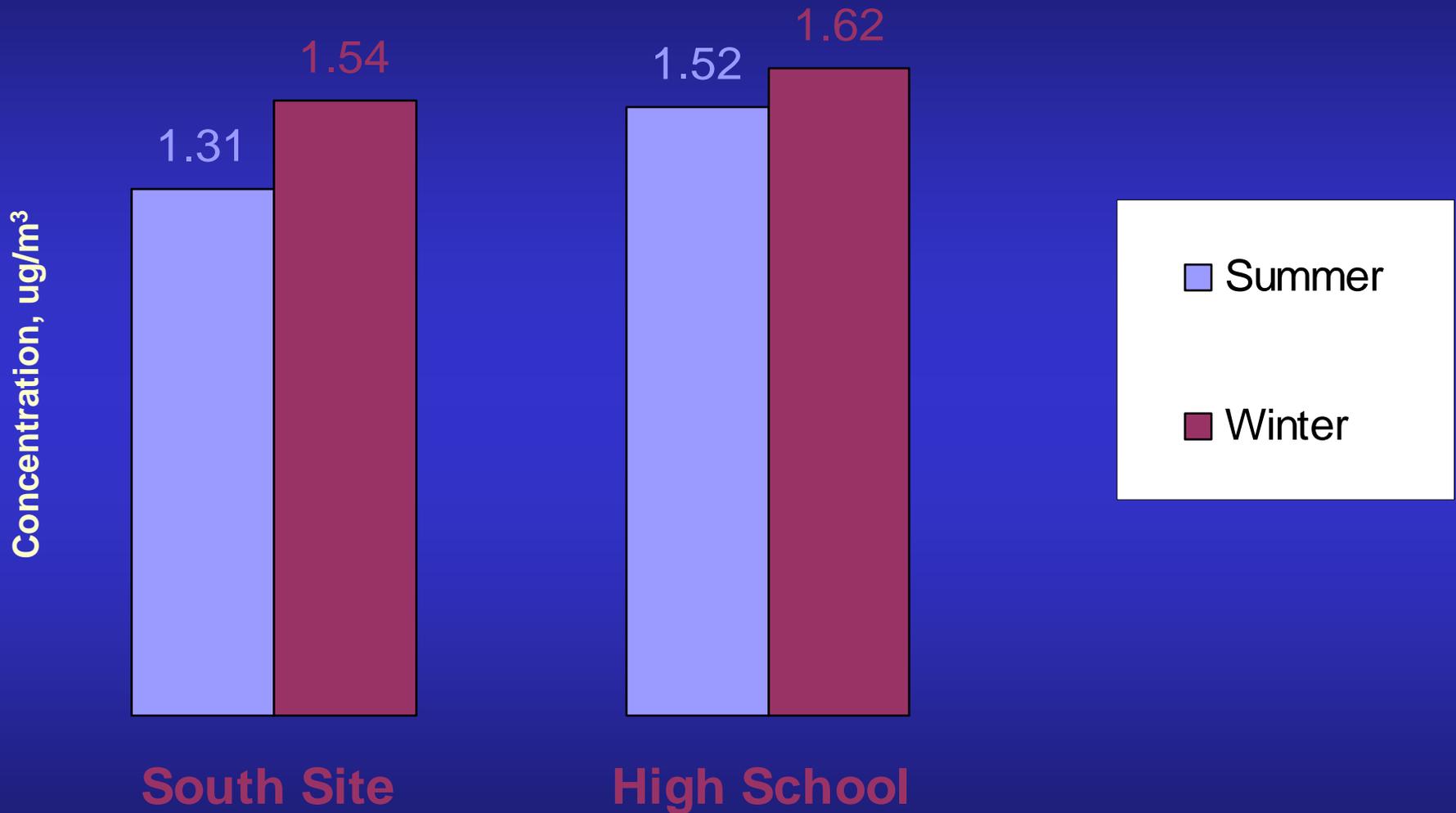


Recent Air Monitoring Findings

- Less than half of the compounds are measurable in air.
- There is a seasonal difference in concentrations, with most compounds higher in the summer.



Benzene



More Findings

- Air data are highly variable.

High
5.4 ug/m³

Average
1.5 ug/m³

Low = < 0.32 ug/m³

High
7.0 ug/m³

Average
1.6 ug/m³

Low = < 0.32 ug/m³



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South Site Winter Benzene

High School Winter Benzene

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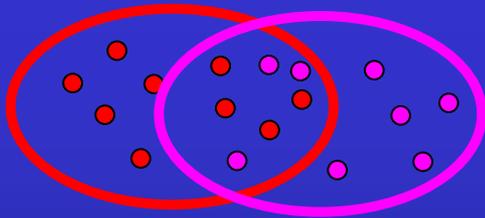
Why are air data so variable?

- **Wind moves compounds and dilutes concentrations**
- **Many sources (vehicles, industry, homes)**
- **Precipitation can wash pollutants out of air**
- **Air temperature (season of year) can impact concentrations**
- **Compounds can vary from hour to hour or day to day**
- **Variability is typical for urban, suburban, and industrial areas**

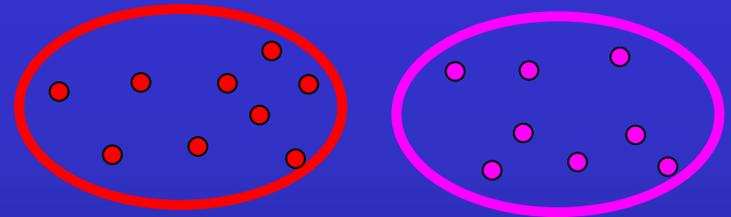


More Findings

- There is no consistent statistically significant difference between the CDF site and the High School site results; some compounds are higher at one site while other compounds are higher at the other site.



Two groups that are similar.



Two groups that are different.



Recent Monitoring Results

- **Based on a statistical analysis of the data, there is no indication that construction activities at the ECI site are causing degradation of the ambient air quality. The type of construction activities on site are not changing.**
- **Changing the sampling frequency from once every six days to once every twelve days is recommended.**



Measured Average Concentrations at South Site and High School Site

<u>South Site</u>		<u>High School Site</u>	
Benzene	1.35 ug/m³	Benzene	1.49 ug/m³
Toluene	2.42 ug/m³	Toluene	2.73 ug/m³
Naphthalene	0.080 ug/m³	Naphthalene	0.088 ug/m³
Lead	0.022 ug/m³	Lead	0.020 ug/m³
TSP	50.0 ug/m³	TSP	48.7 ug/m³

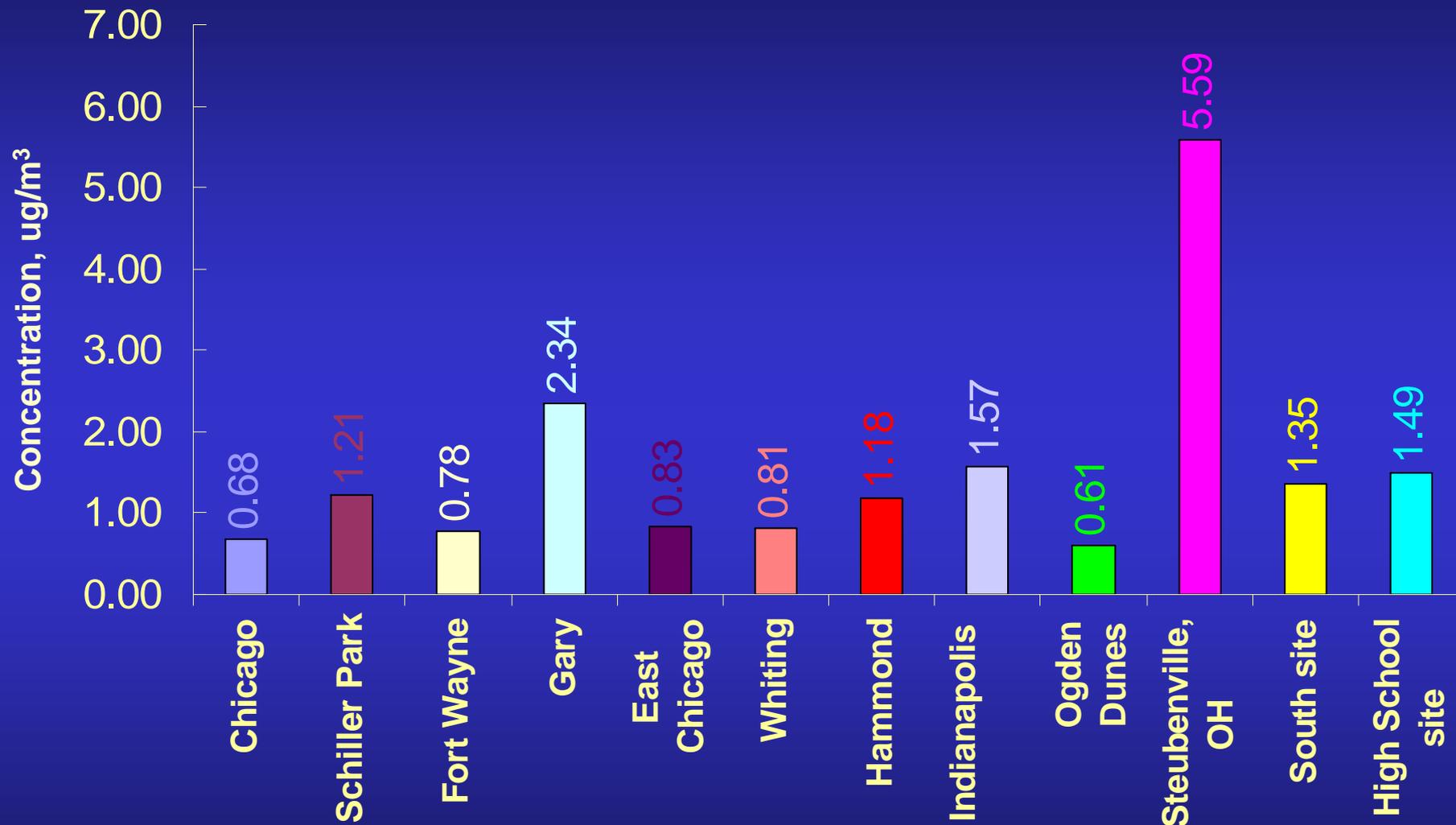


Comparison of air monitoring results

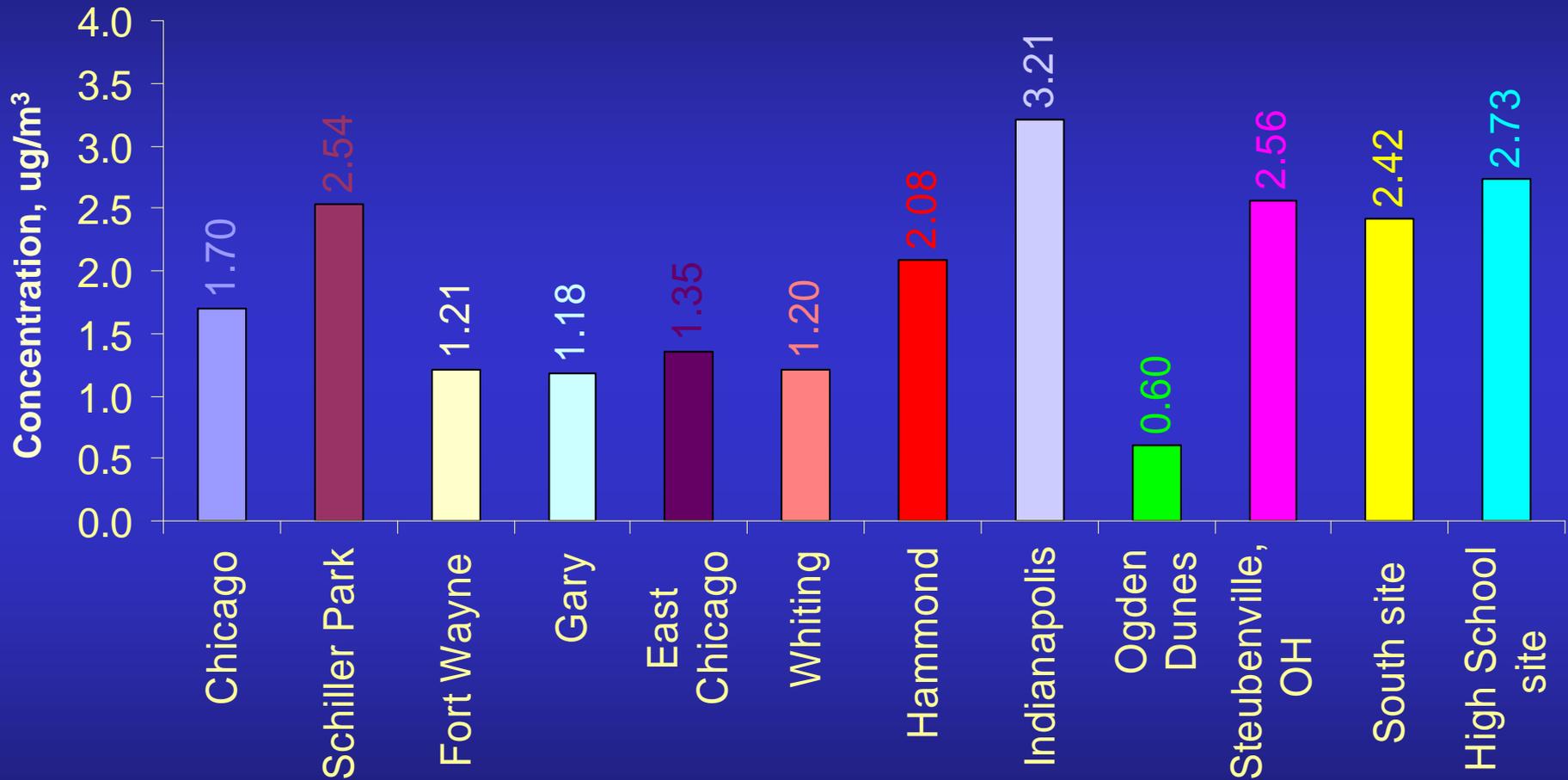
- **Data for comparison are taken from USEPA air quality database: <http://www.epa.gov/air/data/>**
- **Area of data comparison includes Illinois, Indiana, Michigan, and Ohio.**
- **Not all compounds are monitored at all locations**
- **Compounds with data include: benzene, toluene, naphthalene, lead, and Total Suspended Particulates (TSP)**
- **Data were from 2003 through 2007; 5 year average**
- **Data from IHC south site and East Chicago High School are compared.**



Benzene Average Concentration Comparison

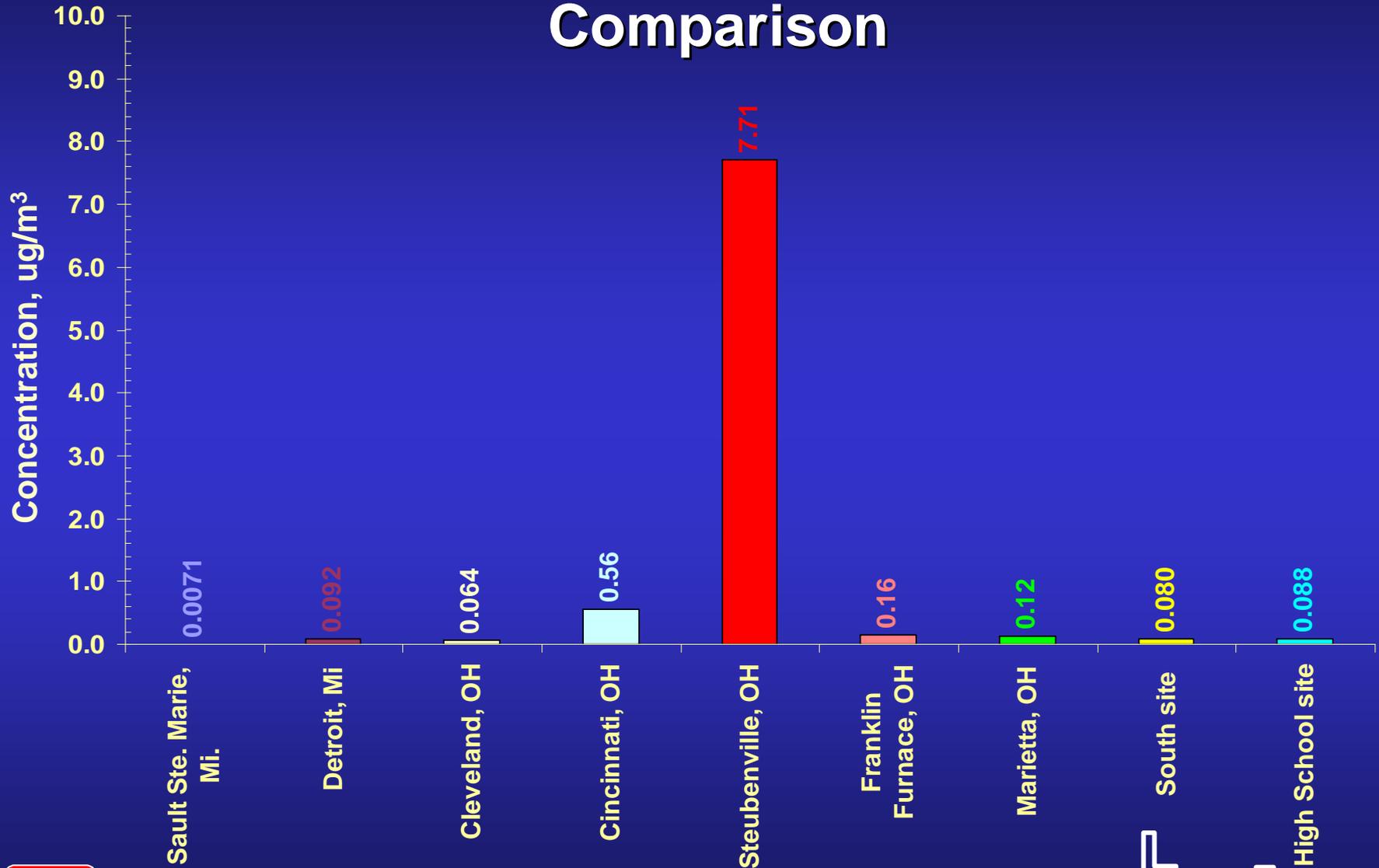


Toluene Average Concentration Comparison



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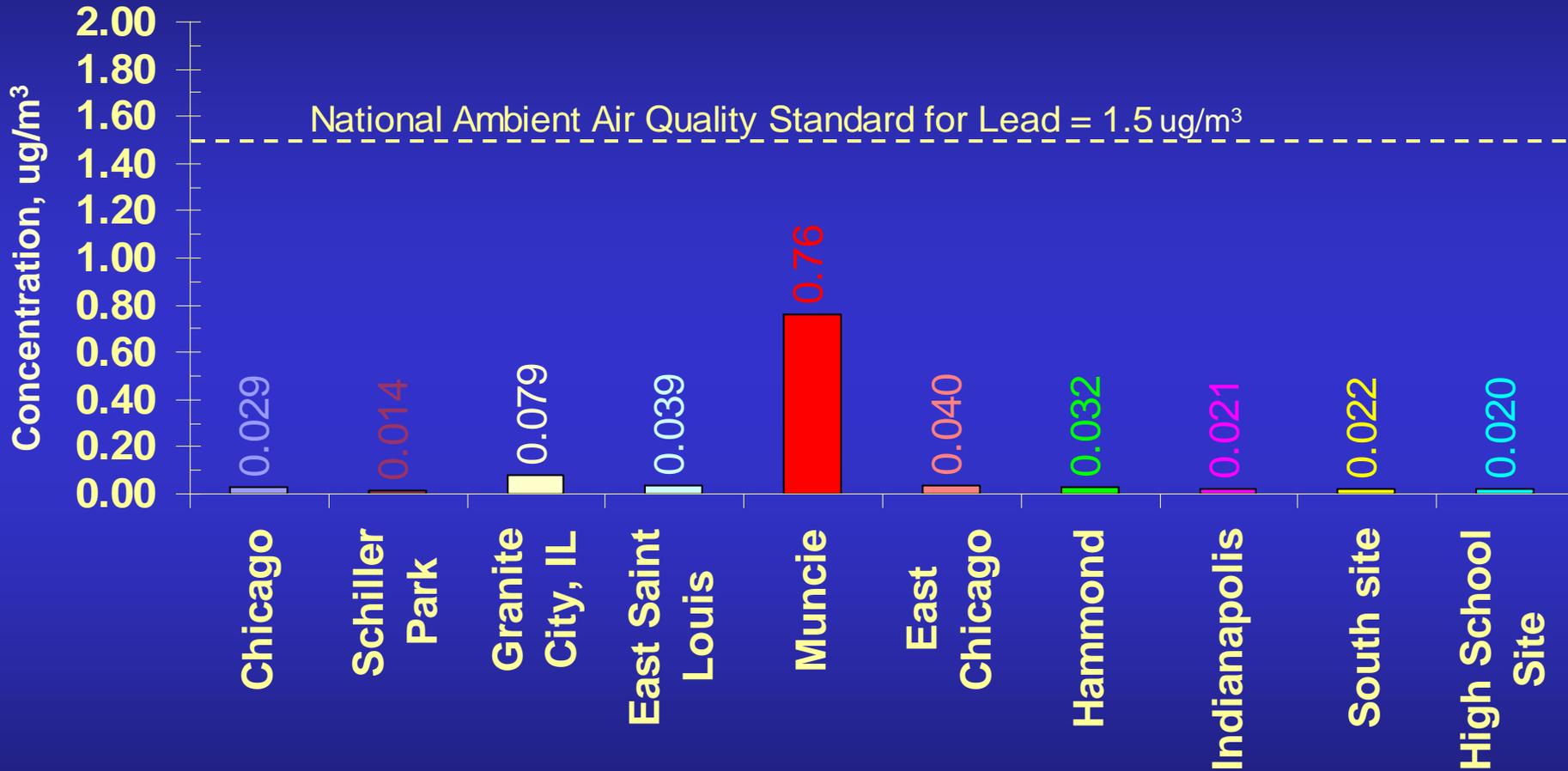
Naphthalene Average Concentration Comparison



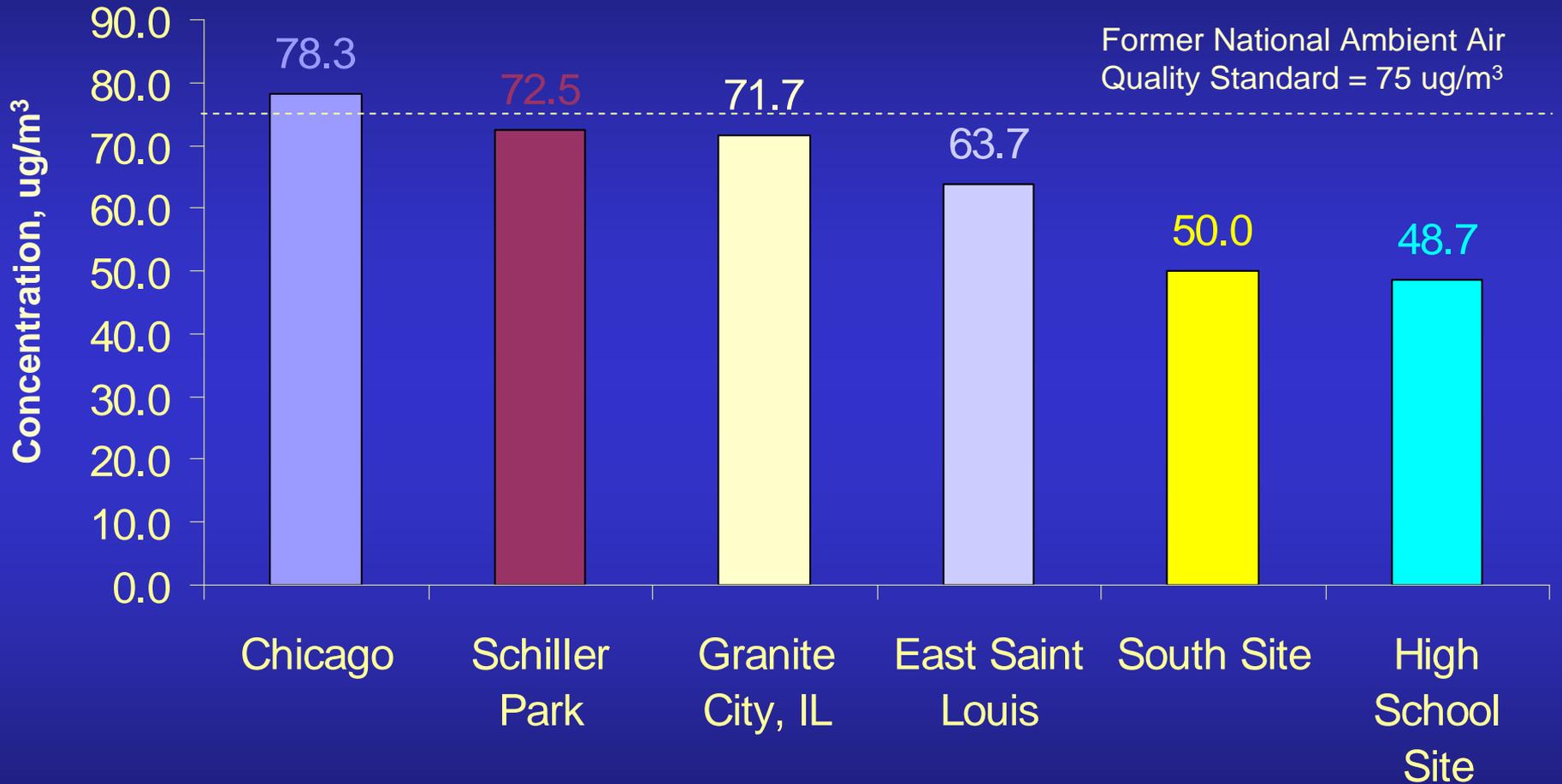
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Lead Average Concentration Comparison



TSP Average Concentration Comparison



Conclusions

- **The IHC air monitoring has provided a substantial dataset for use in future IHC air monitoring and for use by other agencies.**
- **The IHC air monitoring data indicates air quality conditions similar to other regional communities, including urban, suburban, and industrial areas.**
- **The goal of changing sampling frequency is to ensure continuity of the dataset, while still monitoring at an appropriate level for the current activities.**
- **Monitoring will be increased during future dredging activities. This is the topic of the next talk.**



Questions?



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http://www.lrc.usace.army.mil/projects/IN_harbor_canal_CDF/index.html



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