

**MINI-CHAMBER for  
SIDE-BY-SIDE COMPARISON  
of ACTIVE and PASSIVE  
SAMPLERS**

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# ANSI/ISEA 104-1998 Standard for Diffusive Samplers says:

***“... confirmation of sampler performance under field conditions is desirable ...”***

***“... field evaluation should be viewed as ... a desirable supplement to the laboratory evaluation reported under this standard.”***

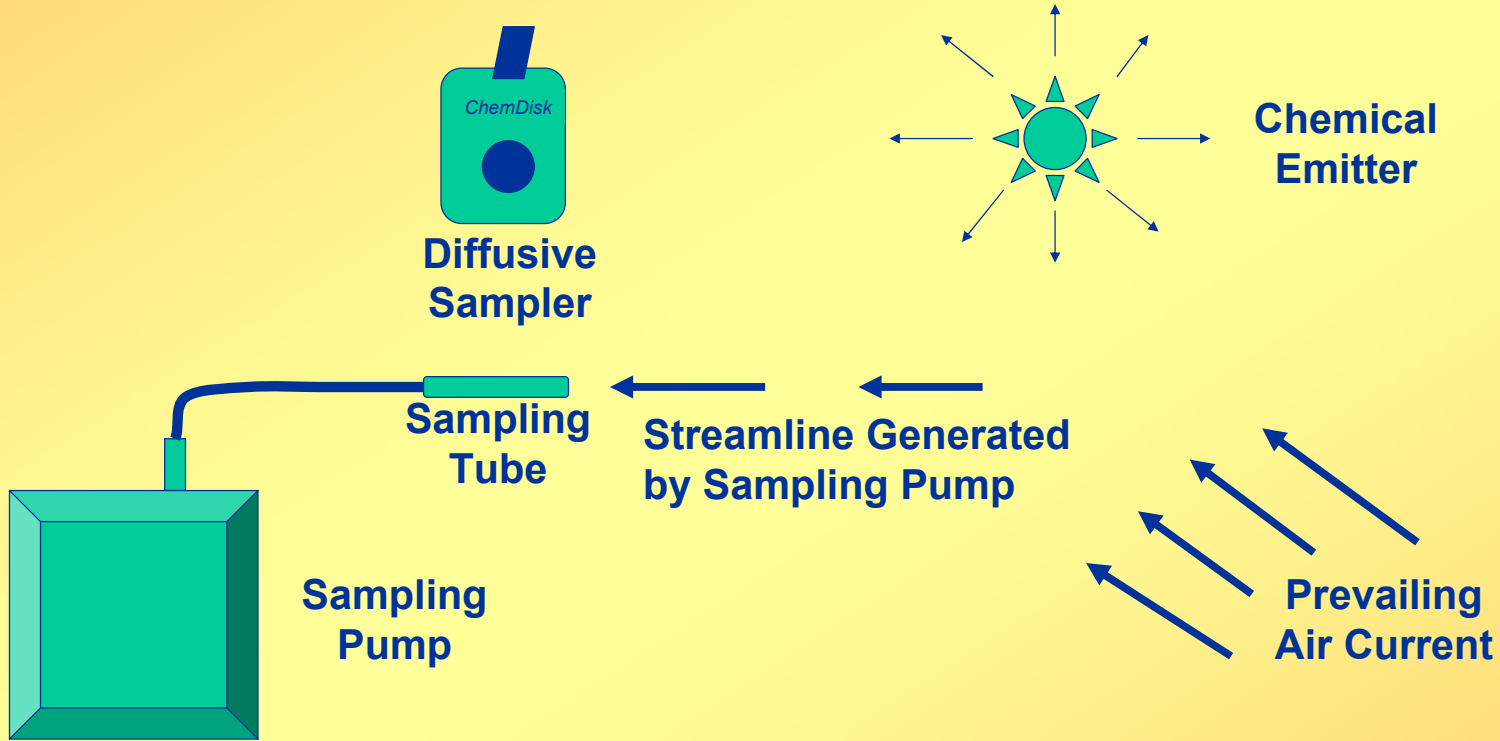
# Good Practice in Industrial Hygiene

***“Before Changing Sampling Methods,  
I want to verify that Method B  
will agree with Method A.”***

# Scope of Presentation:

- **Overcoming Difficulties in Comparing Samplers Side-by-Side**
  - **Disagreement due to Non-Uniform Environment**
- **Side-by-Side Studies using Mixed Air**
- **Implications for Sampler Evaluation**

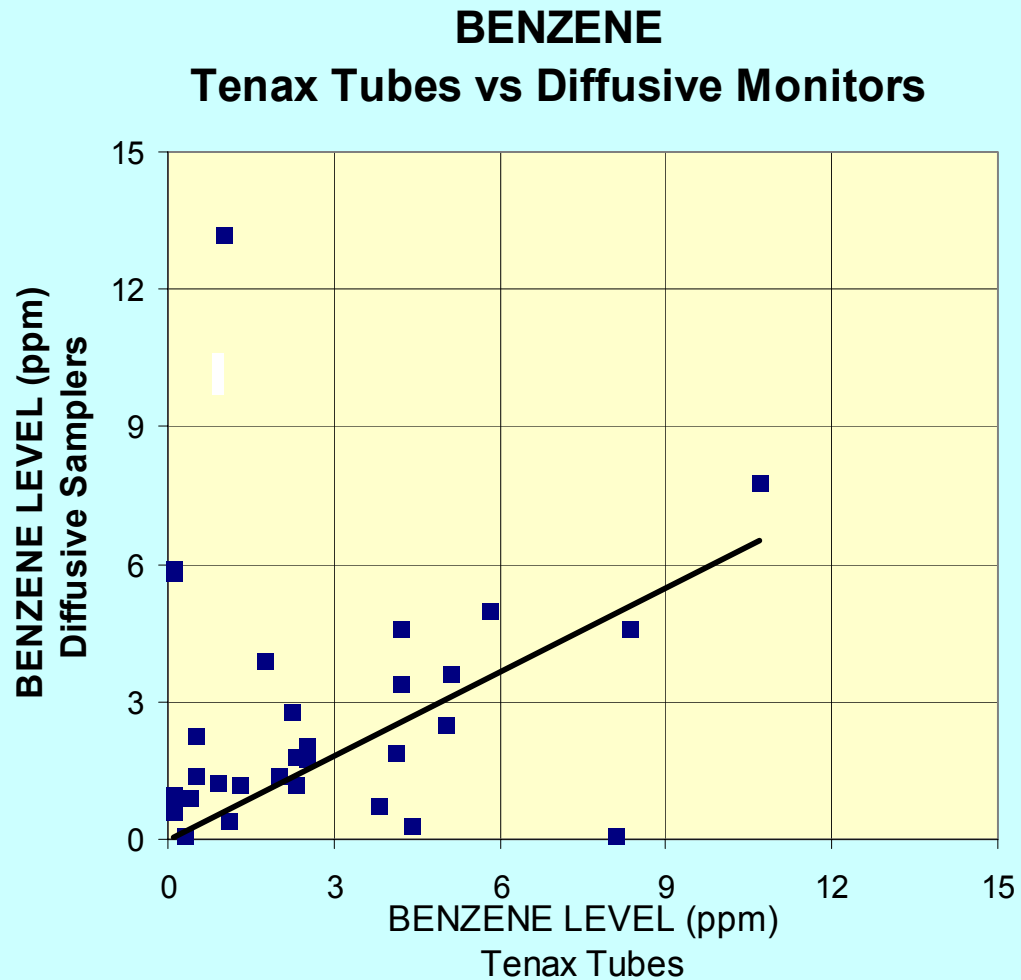
# ***FACTORS in Generating Non-Uniform Environment***



**Cause of Error in Side-by-Side Sampler Comparison**

# Side-by-Side Results

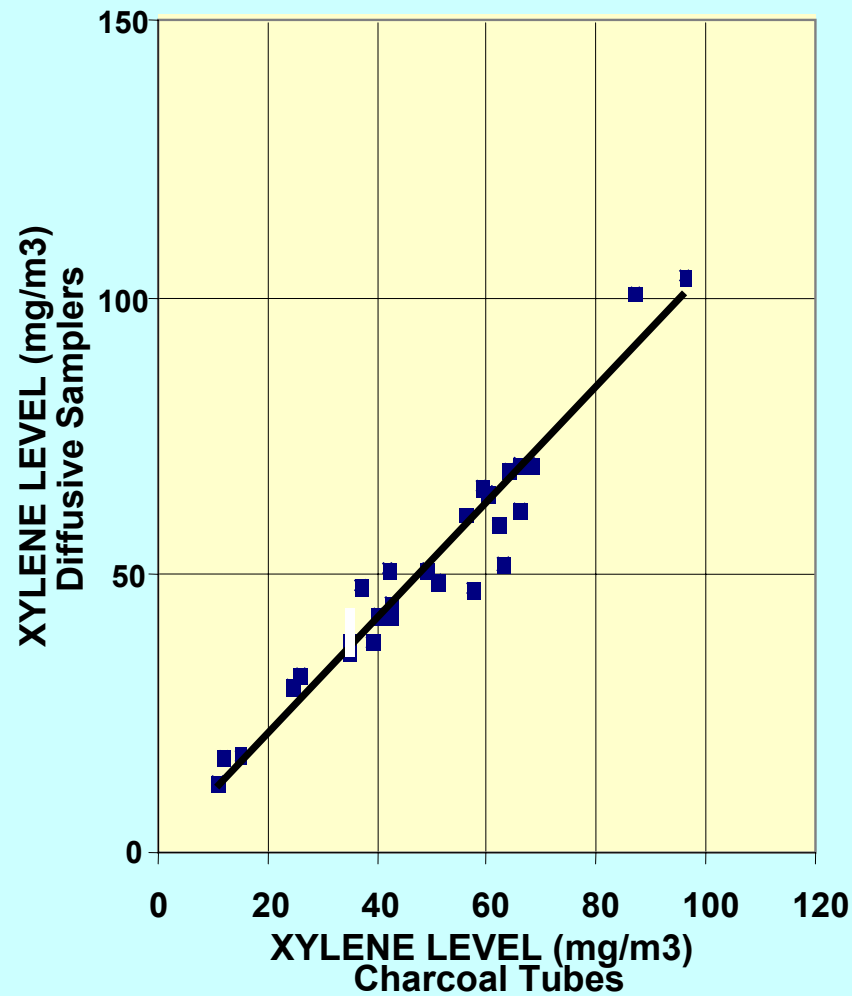
*Non-Mixed Environment*



# Side-by-Side Results

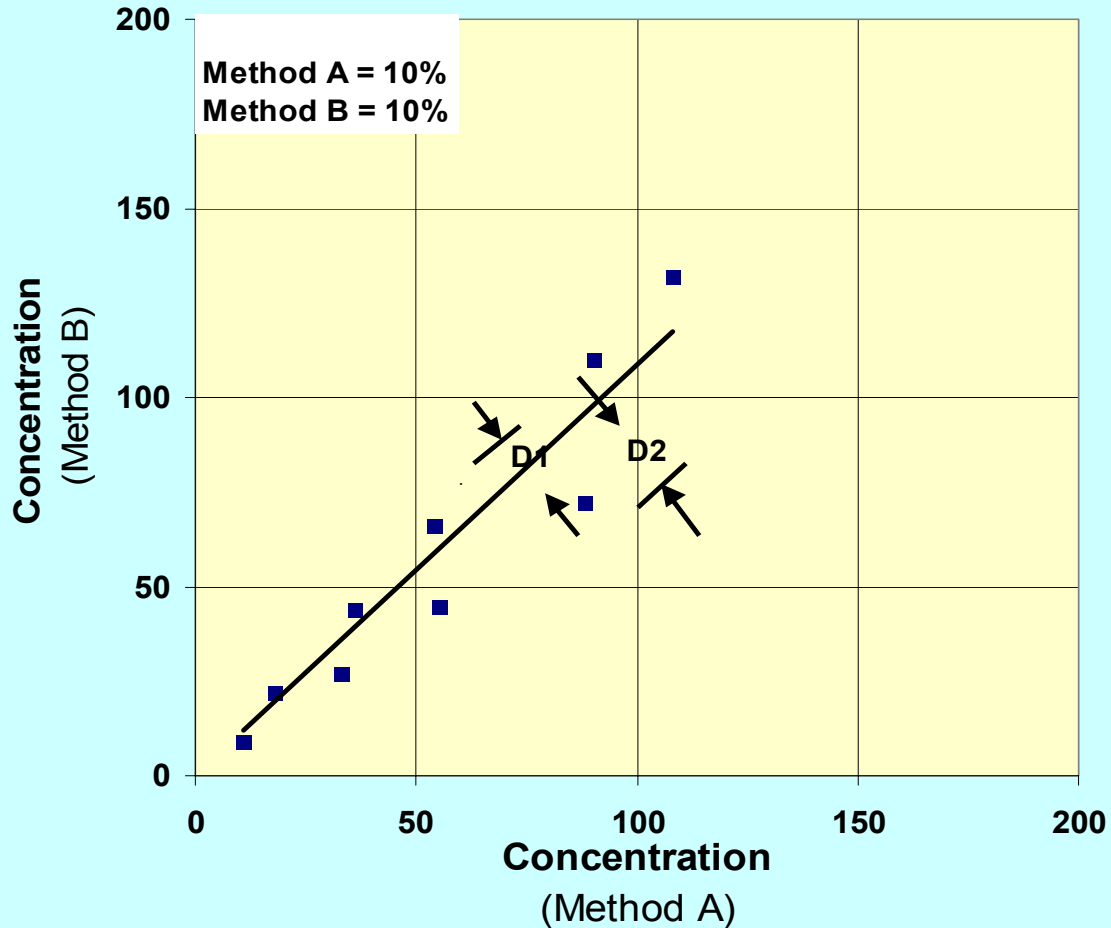
*Mixed Environment*

## XYLENE - Charcoal Tubes vs Diffusive Samplers



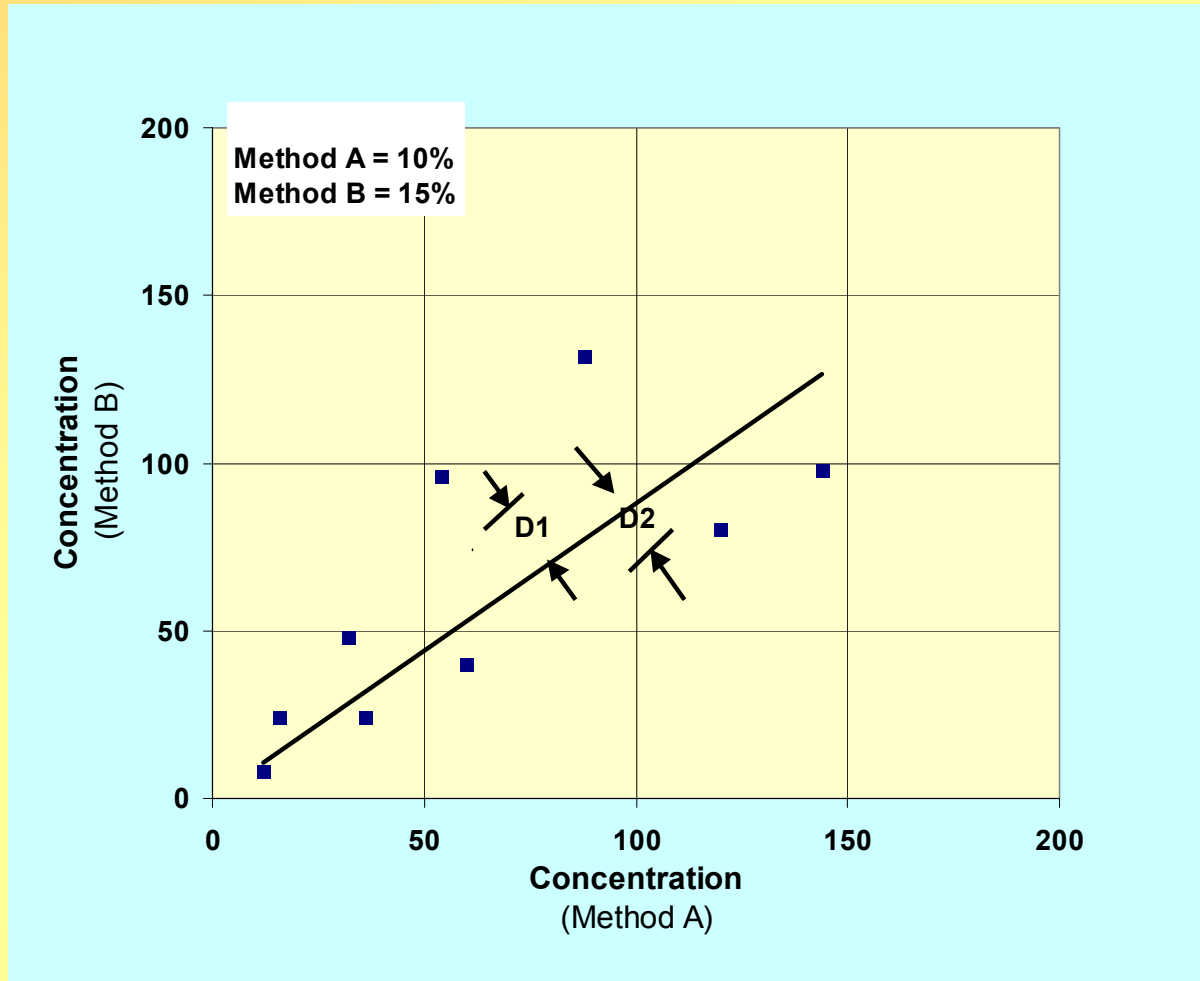
# Method Variation

Method B has equal variation to Method A



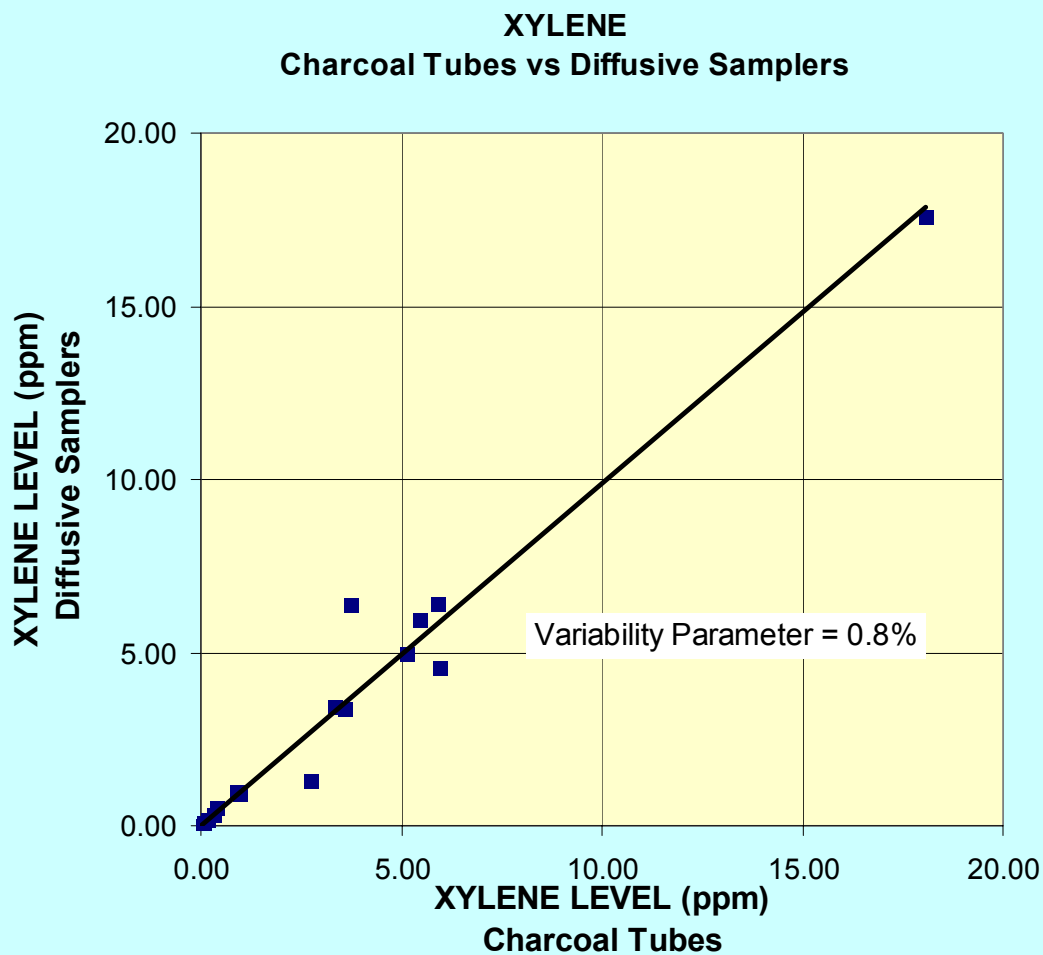
# Method Variation

Method B varies more than Method A



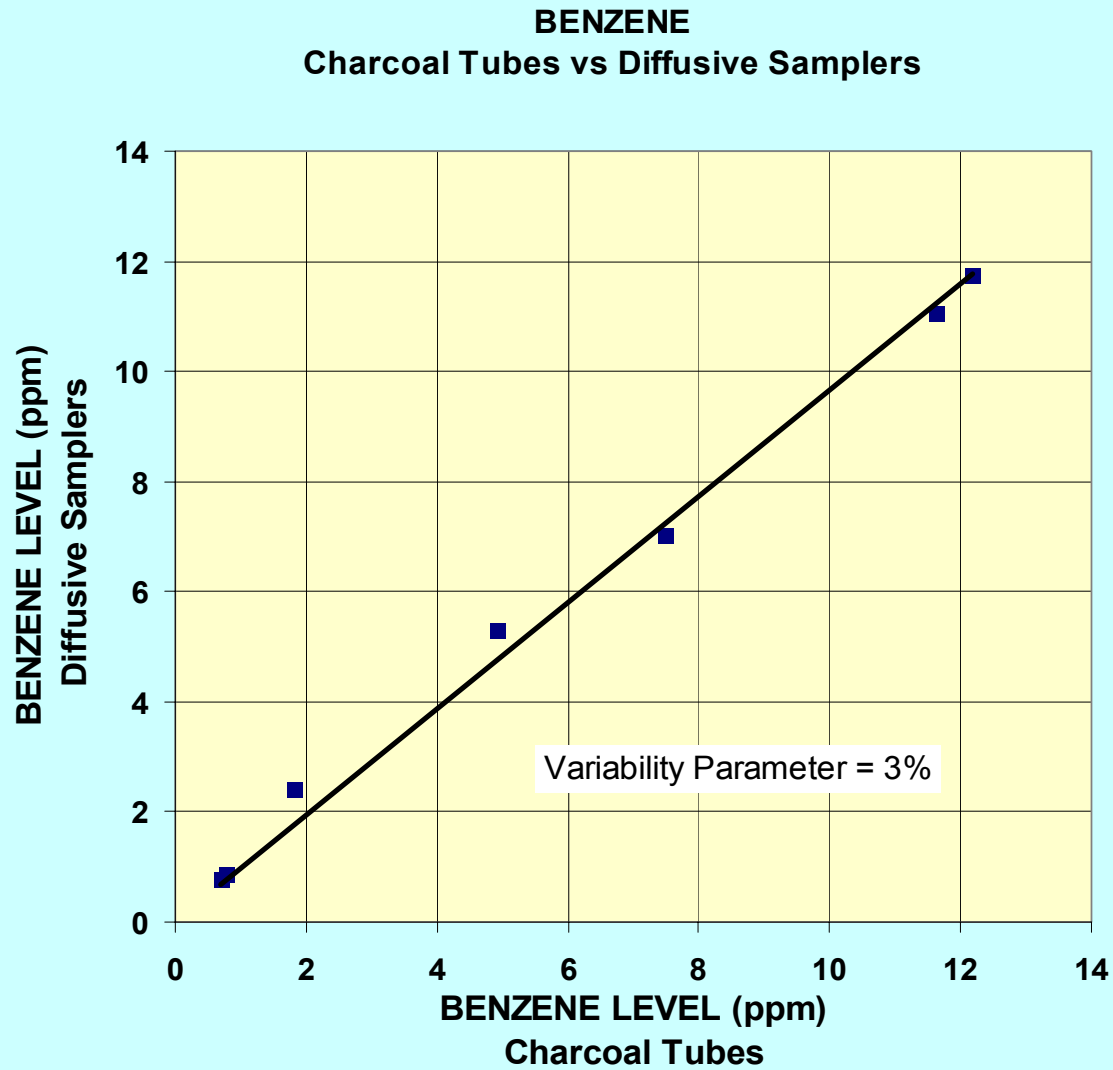
# Side-by-Side Field Study

## Portable Chamber #1



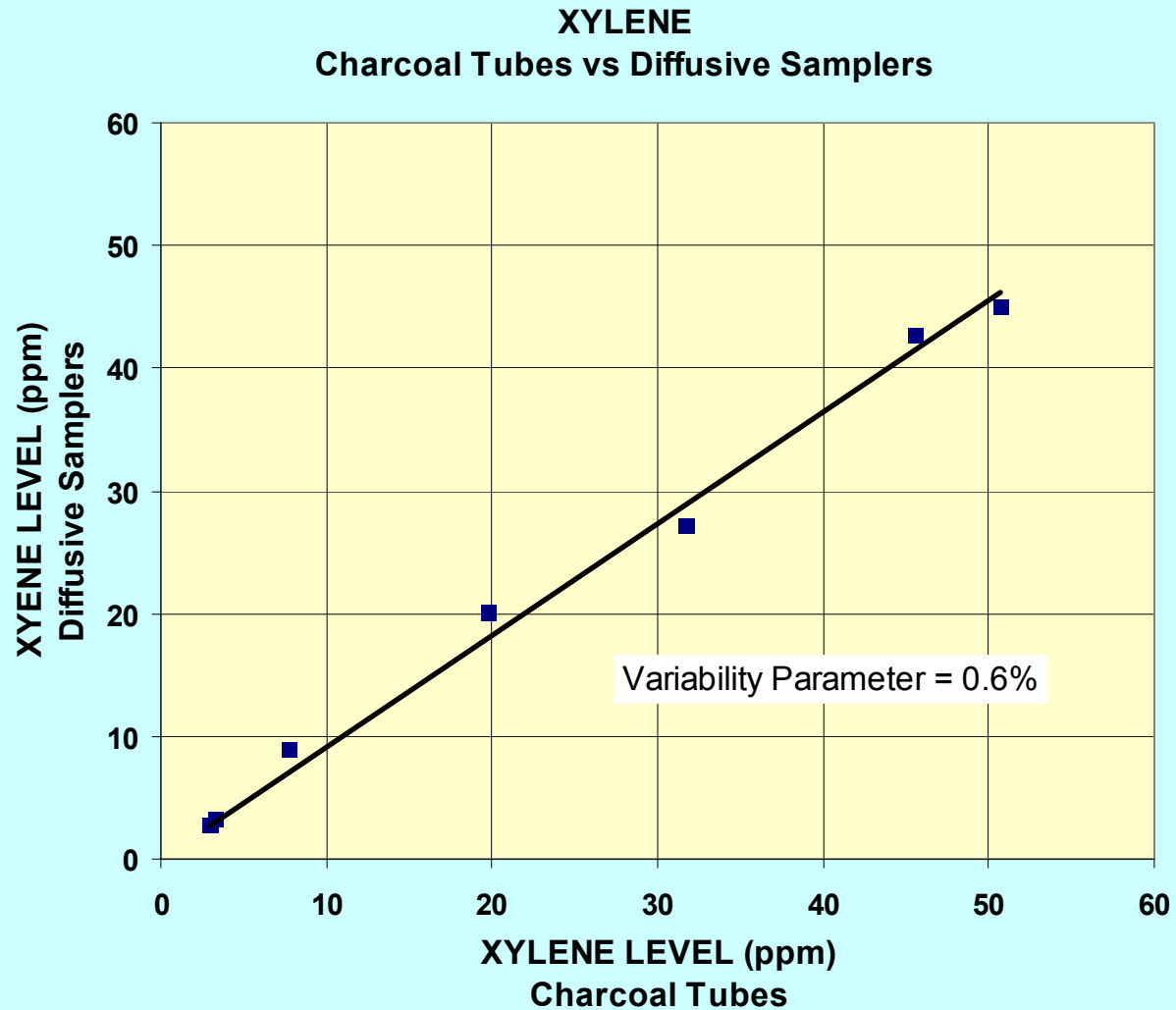
# Side-by-Side Field Study

## Portable Chamber #1



# Side-by-Side Field Study

## Portable Chamber #2

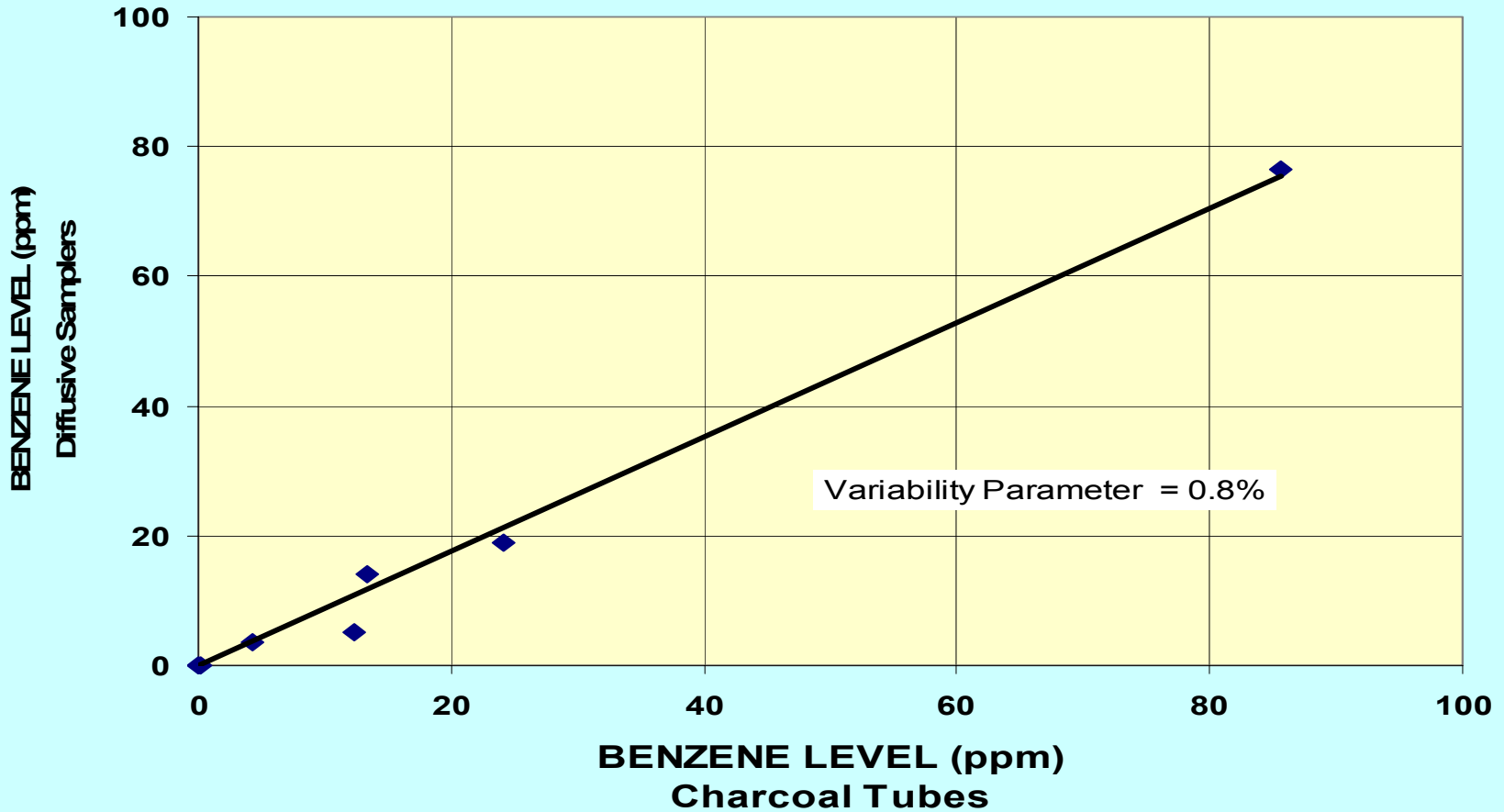


# Side-by-Side Field Study

## Portable Chamber #2

### BENZENE

#### Charcoal Tubes vs Diffusive Samplers



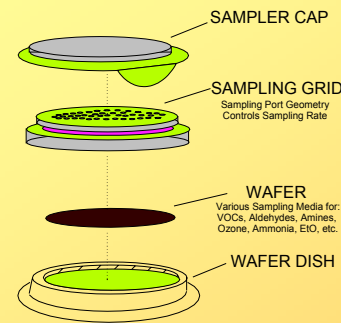
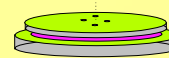
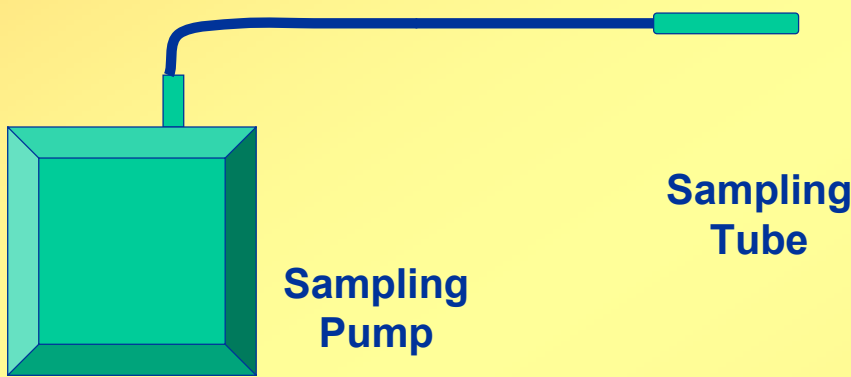
# Conclusions:

- **Using a Common Stream of Mixed Air in Side-by-Side Sampler Comparison led to reduced variation as indicated by increases in  $R^2$  from 0.85 to 0.99**
- **Field Side-by-Side Sampler Comparisons should be conducted using a common stream of mixed air.**
- **A small inexpensive Mini-Chamber can provide a common stream of mixed air for Field Sampler comparison within reasonable cost and resource constraints.**

# VARYING the RATIO

## of Sample Capacity to Sample Volume

**AT Sampler Model..... AT548    AT546    AT541**  
**No. of Sampling Ports..... 4            19            76**



<b>Charcoal Mass(mg).....</b>	<b>100</b>	<b>200</b>	<b>200</b>	<b>200</b>
<b>Sampling Rate(ml/min)...</b>	<b>100(typ)</b>	<b>0.8</b>	<b>2.5</b>	<b>10</b>
<b>Ratio M/SR</b>	<b>= 1.0</b>	<b>250</b>	<b>80</b>	<b>20</b>