

THE LEADER IN ENVIRONMENTAL TESTING

### Performance Characteristics of Different Sample Preparation Methods

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## **Comparing Methods**



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#### Lots of variables

- ✤ 3510, Separatory Funnel Extraction
  - How vigorous is the shake?
  - What is the Sep funnel material?
  - How skilled is the analyst?
  - Variables in concentration technique
- ✤ 3520, Continuous Liquid / Liquid Extraction
  - Design of extractor
  - Solvent cycling rate
  - Condenser temperature
  - Variables in concentration technique

## **Two options**



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- Control all the variables
- Use a lot of data
  - Many different labs
  - Many different analysts
  - Many detail differences in technique



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## Method 8270, Semivolatiles GCMS Prep methods 3510 – Separatory funnel 3520 – Continuous Liquid Liquid Extraction

## **Data Collection**



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25 labs
106 common analytes
57 uncommon analytes (< 10 LCS or MS per month for one of the methods)</li>
Measure recovery for LCS, MB. MS and MSD
200,000 lines of data per month

## 3510 vs 3520 overall



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## 3520 better than 3510



60 50 40 30 20 10 Lab QC 0 Field QC Phenol Caprolactam Benzoic acid Phenol-d5 4-Nitrophenol N-Nitrosodimethylamine 2-Fluorophenol 3 & 4 Methylphenol 2-Fluorobiphenyl (Surr) Pyridine Pentachlorophenol 1,4-Dioxane

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## PAH



8.0 6.0 Lab + 3520 better 4.0 Field +3520 better 2.0 0.0 Naphthale mdenal1,2,3.cdlpyrene -2.0 enzolbh entolk enzol9. Horanthe penzla Wsene macene Rzolal nzolal april phinylene eve e б -4.0 anthem enviene Macen anthe intact 2 -6.0 -8.0 -10.0

## **Identifying Problems**



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#### LabA vs All labs



## PCBs 3510 vs 3520



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#### 3510 vs. 3520 Lab Spike

Recovery 3510

Recovery 3520



## PCBs 3510 vs 3520



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#### 3510 vs 3520 Sample spike

■3510 Recovery

■ 3520 Recovery



## DCB % recovery by lab





# DCB and TCMX percent recovery by lab



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## Conclusions



- As expected, 3520 is better than 3510 for acidic analytes
  - But, 3510 is better than 3520 for many "active" analytes
- 3510 appears better than 3520 for PAH for LAB QC
  - But not so much for samples
- 3510 is overall better than 3520 for PCBs
- Large data sets can be used to identify both low performing and high performing labs



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## Questions?