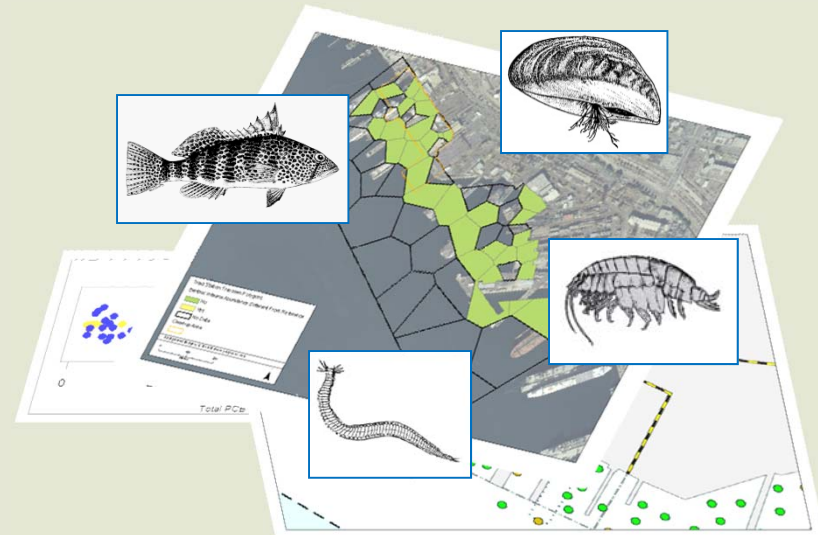


Cleanup Thresholds

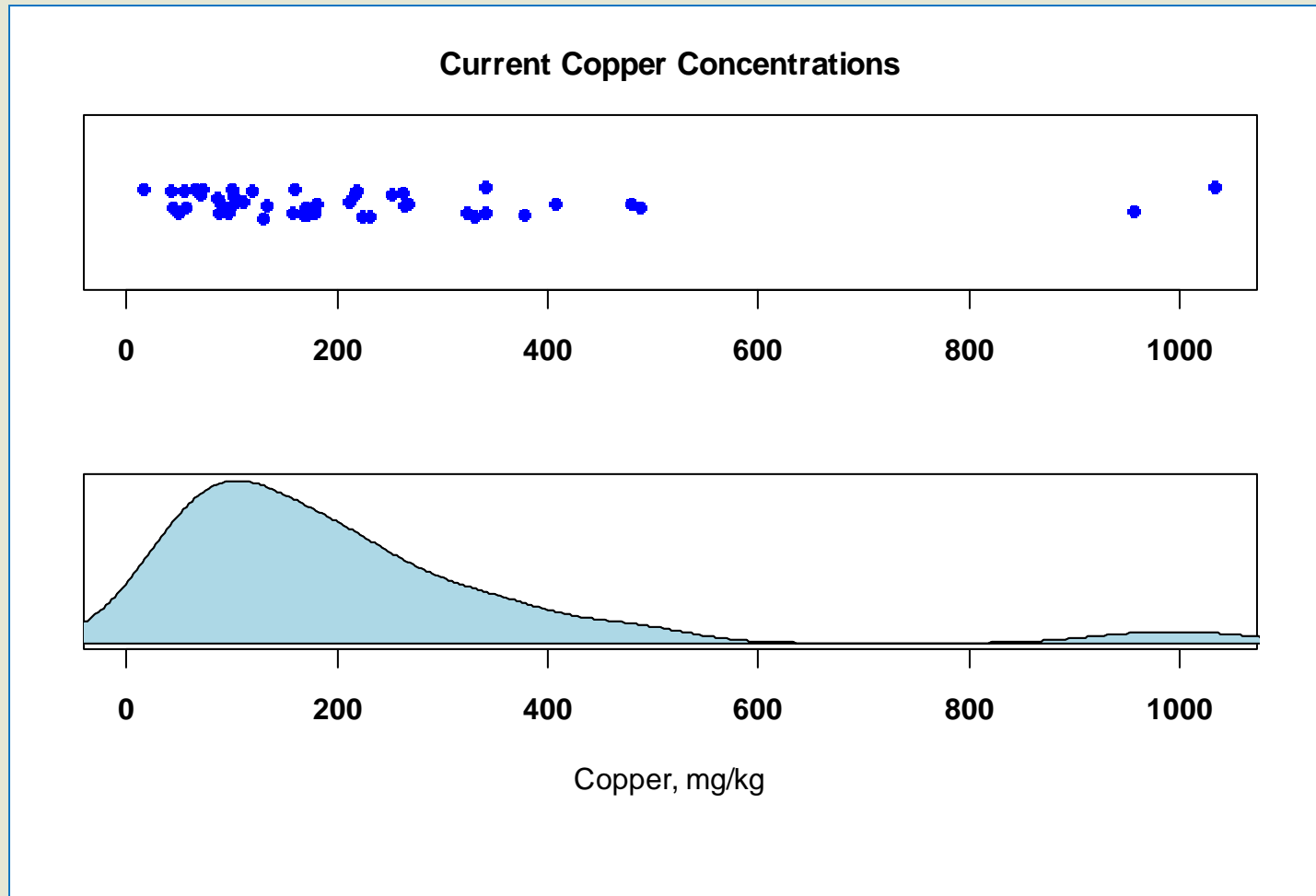
San Diego Shipyard Site

Dreas Nielsen

On behalf of BAE Systems



Environmental Concentration Data



Duplicate Laboratory Analyses

- Inorganic chemicals
 - Solids: Relative Percent Difference <20% (or <35%)
 - Source: U.S. EPA. 1994. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review
- Organic chemicals
 - Solids: Relative Percent Difference <19-50%
 - Source: U.S. EPA. 2008. USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods in Data Review

Accounting for Uncertainty During Post-Remedy Sampling

- For a sample: 120% of background
- For the site: upper confidence limit of the SWAC-based ACL

EPA Guidance on Background Comparisons

The action level for background comparisons is the largest value of the difference in means that is acceptable to the decision maker.

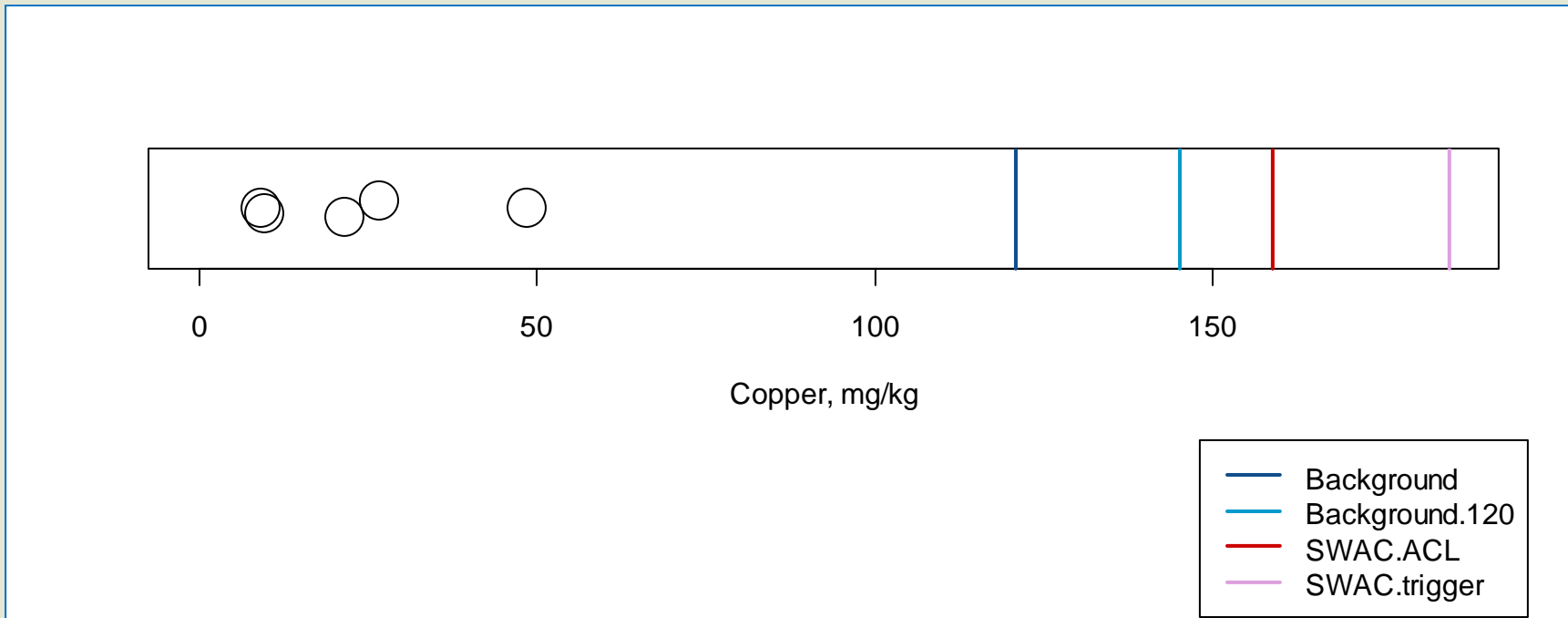
It is necessary to specify a gray region...because the decision may be “too close to call” due to uncertainty...

U.S. EPA. 2002. Guidance for comparing background and chemical concentrations in soil for CERCLA sites.

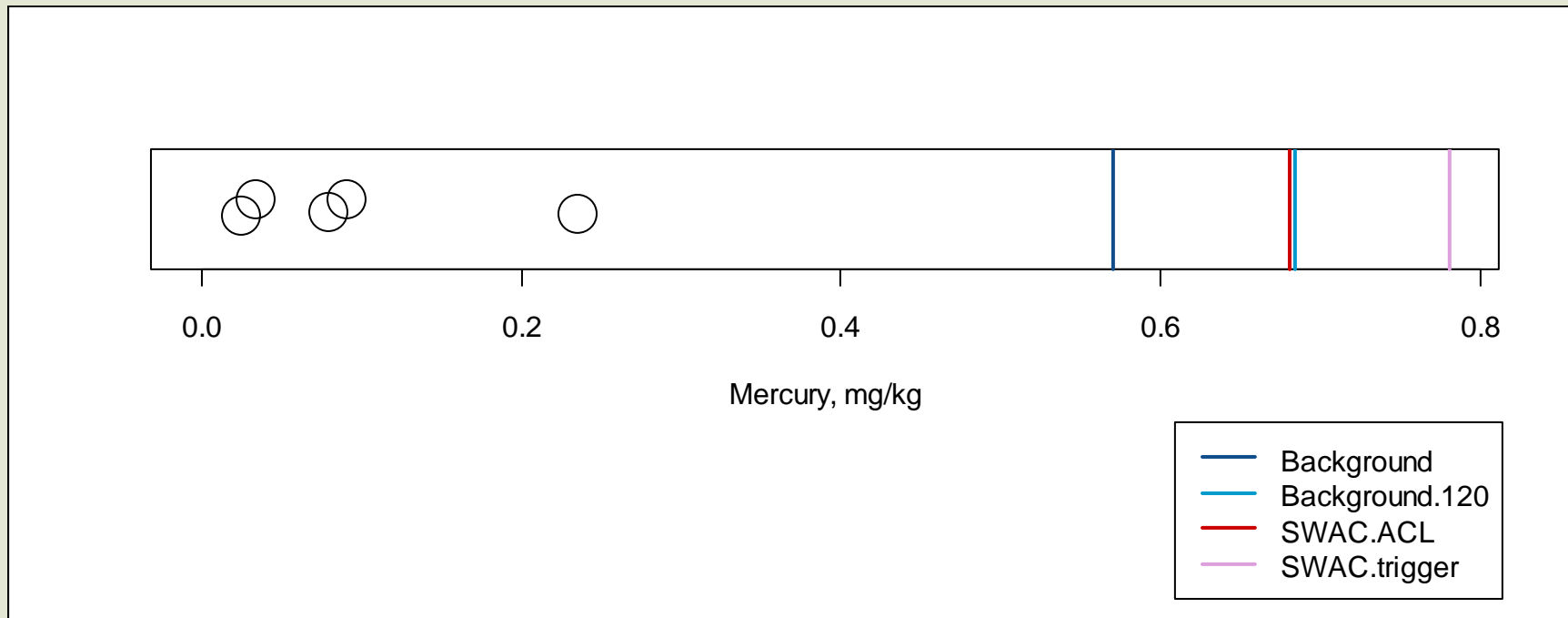
Dredging Results at BAE Systems

- Dry dock sump dredged
- Partially in cleanup area
- Dredged to < 120% background
- Result: All COCs were less than background

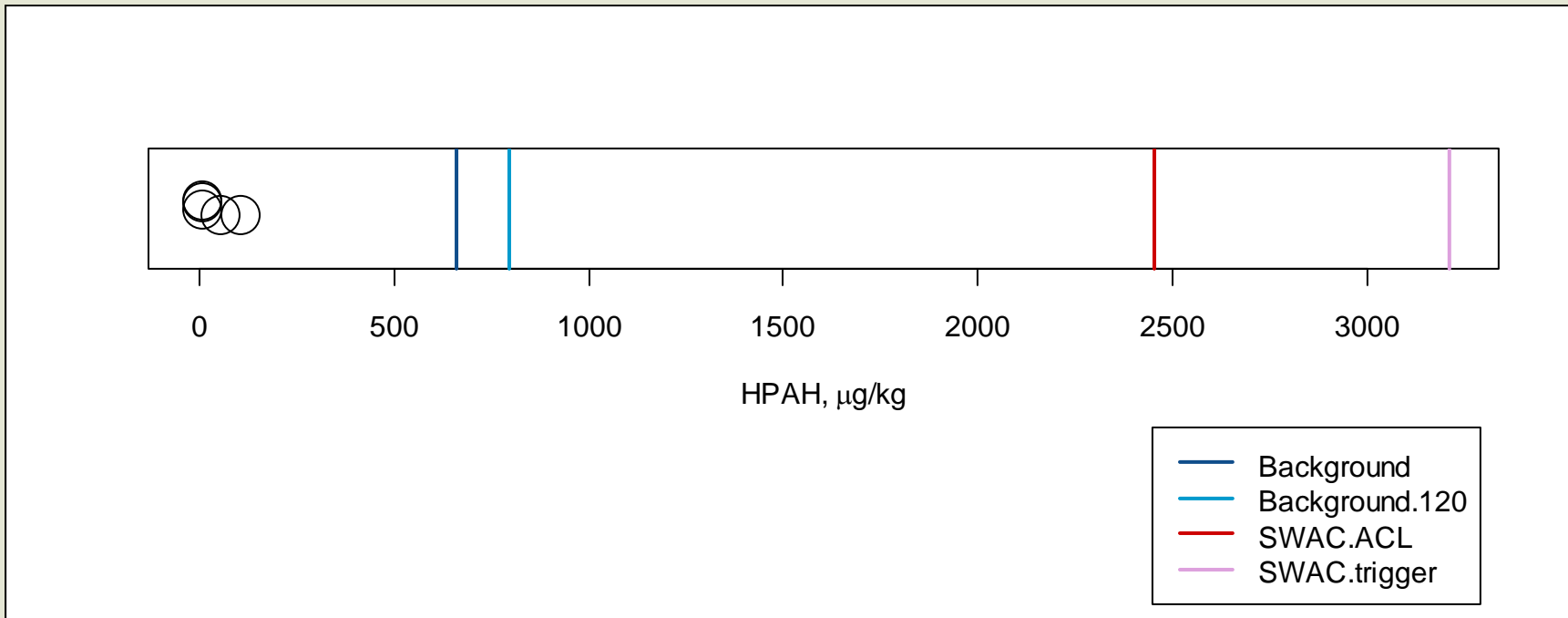
Dredging Results: Copper



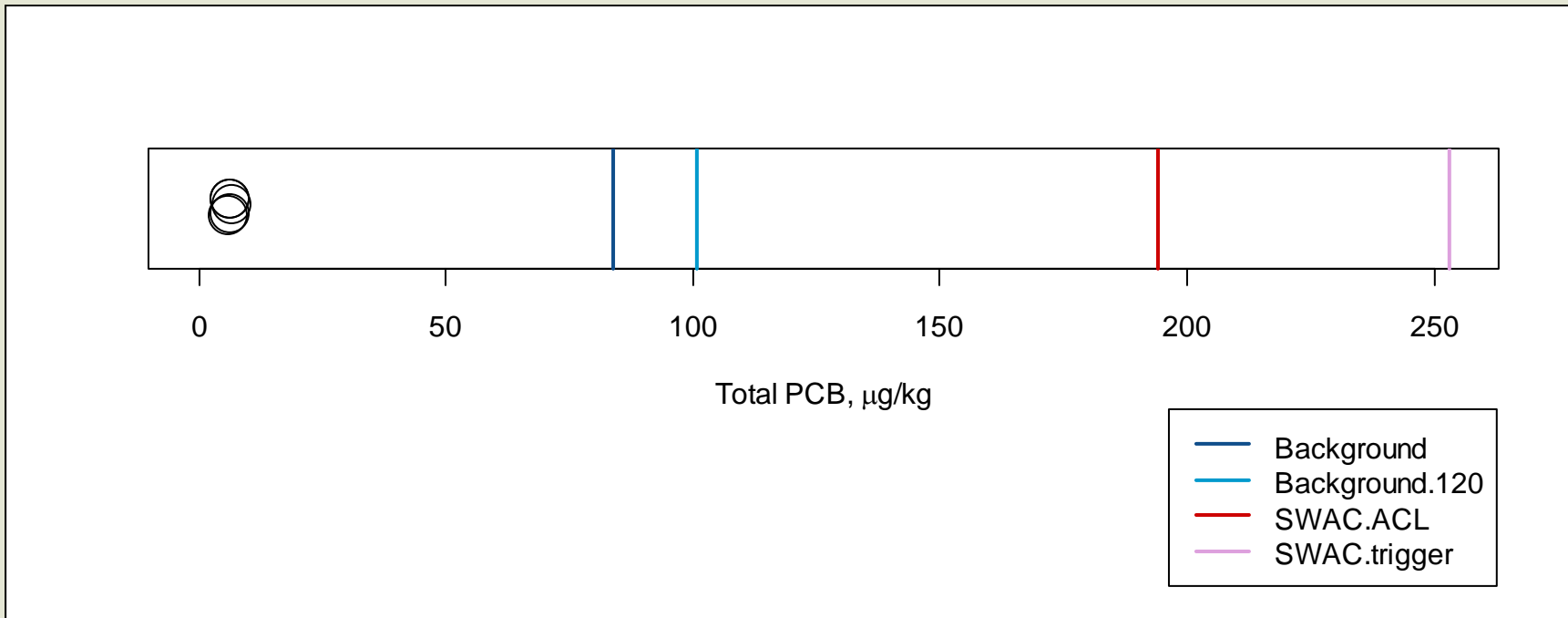
Dredging Results: Mercury



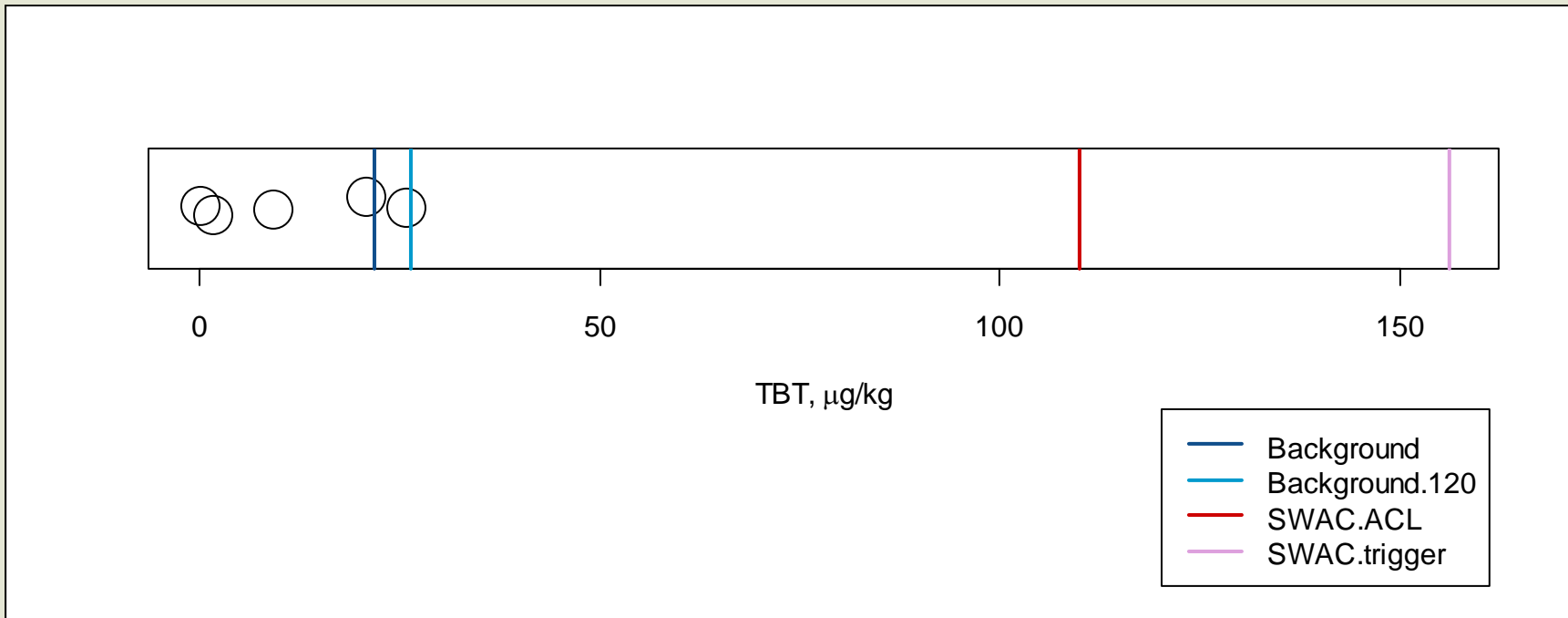
Dredging Results: HPAH



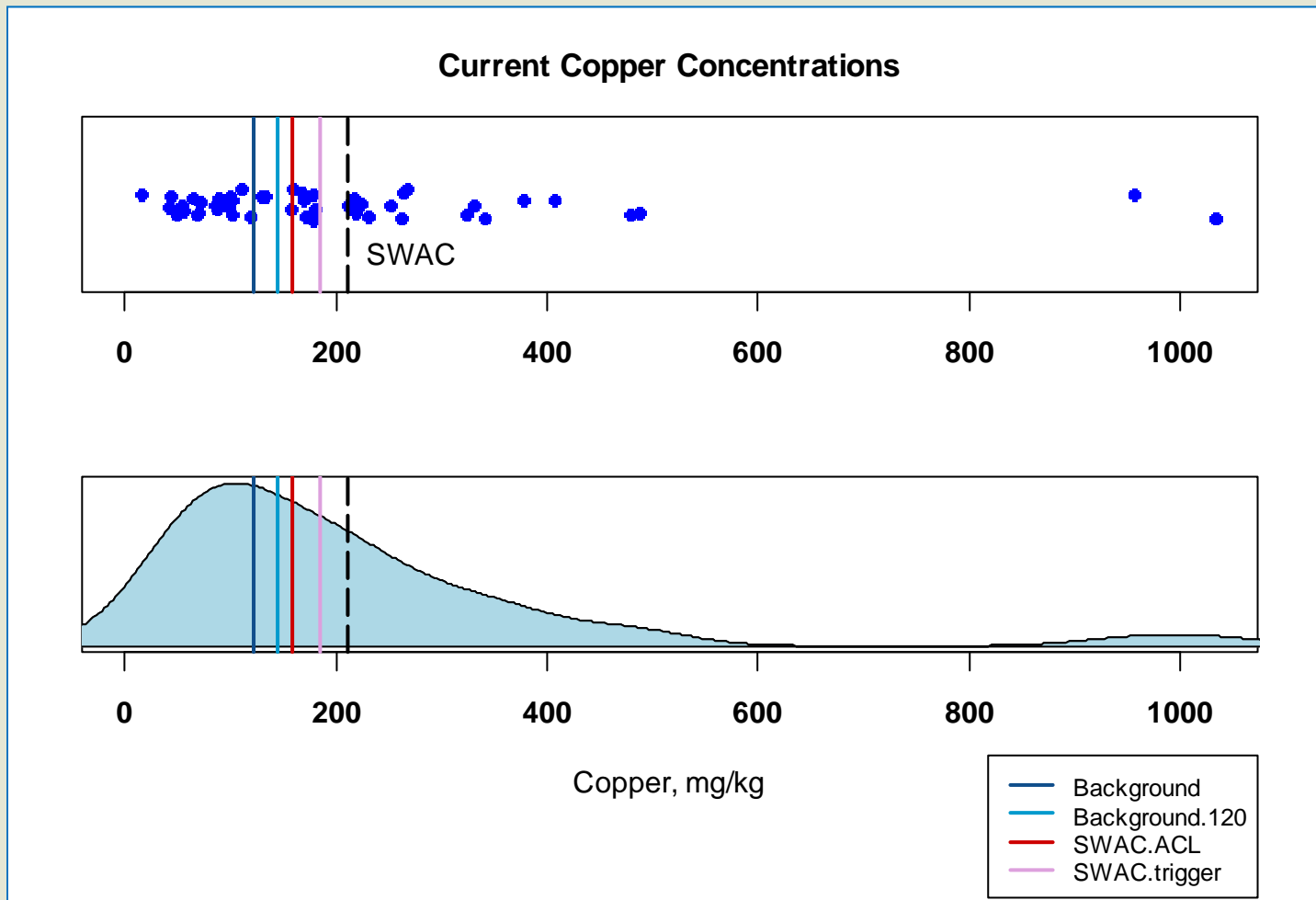
Dredging Results: PCBs



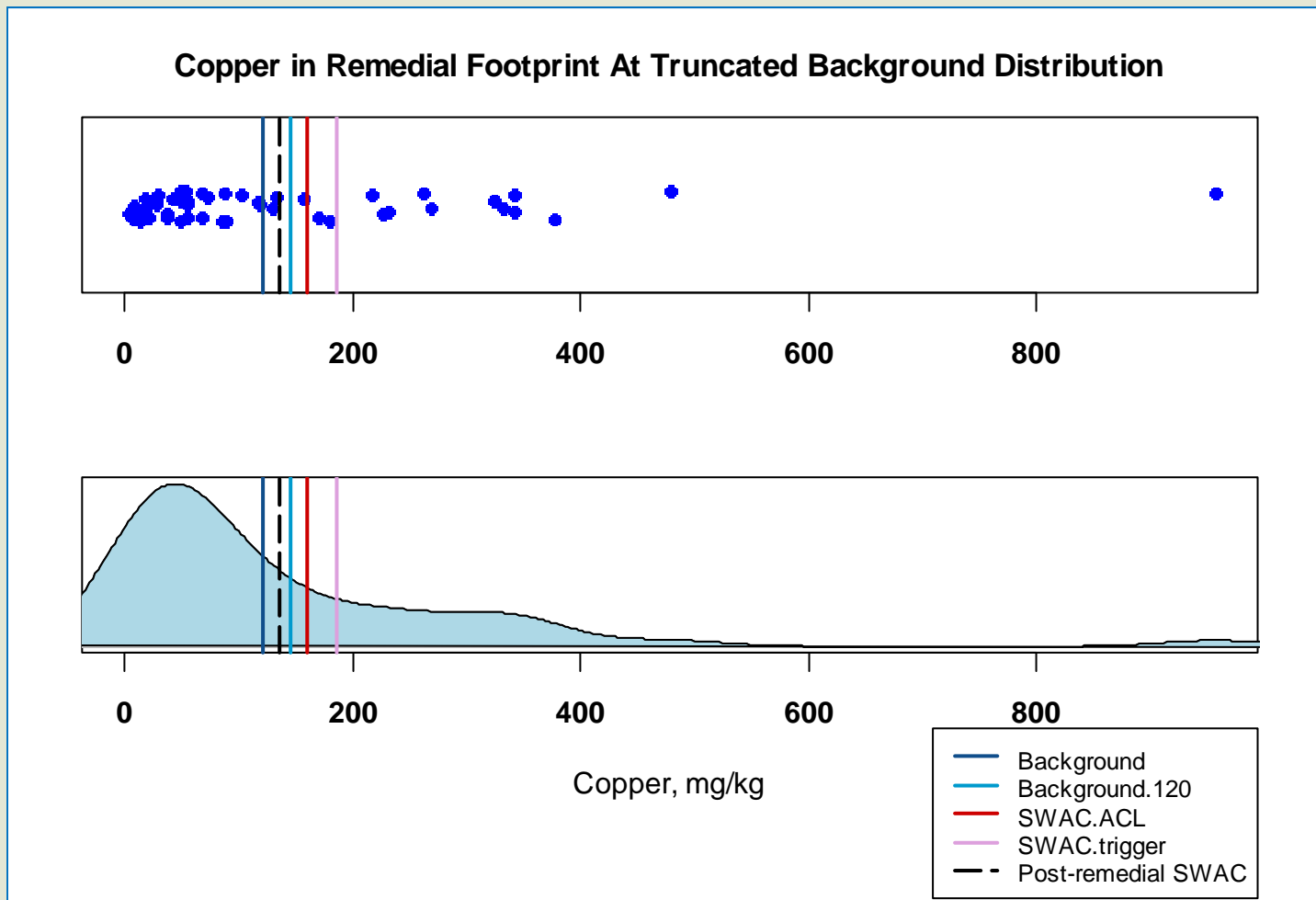
Dredging Results: TBT



Example: Copper, Pre-Remedy



Example: Copper, Post-Remedy

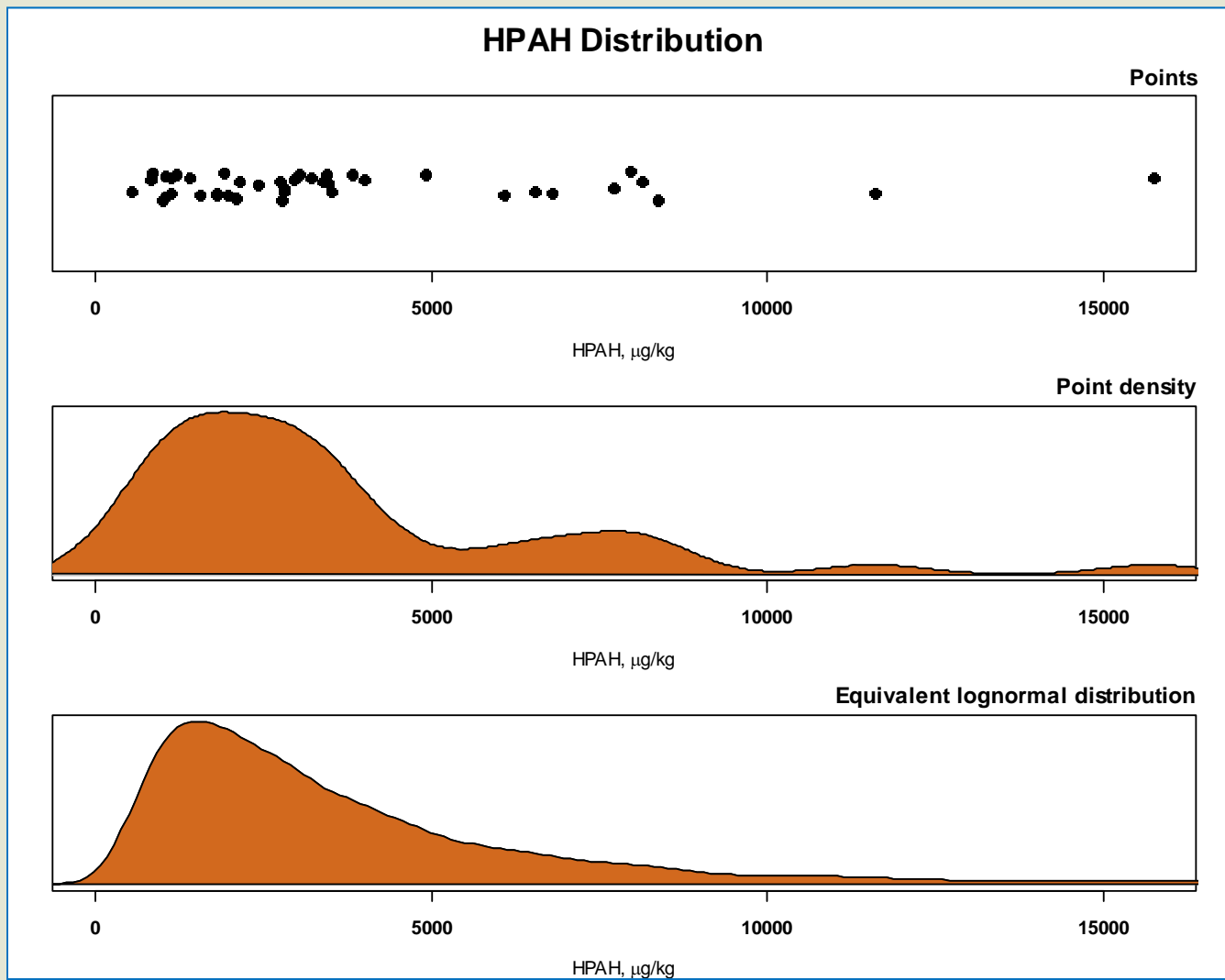


EPA Guidance on Use of Confidence Limits

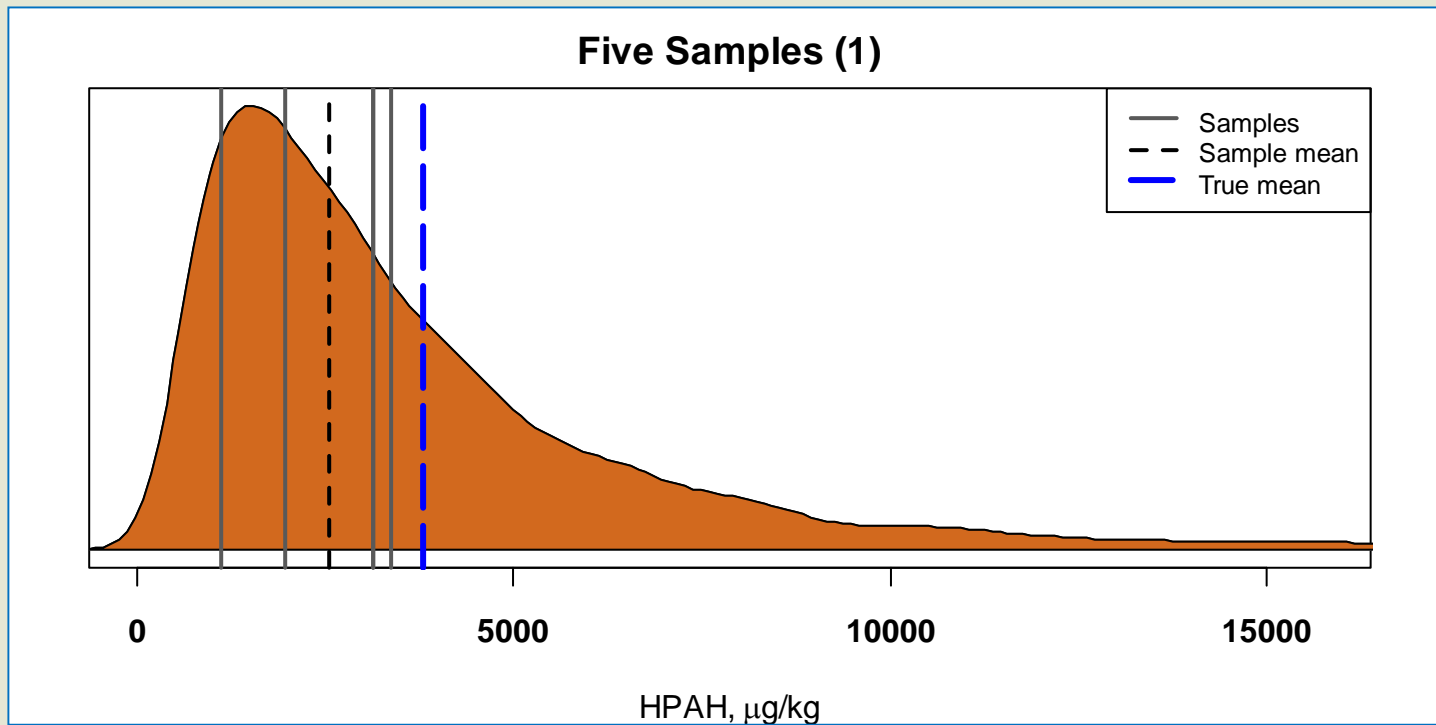
A confidence interval can be used to make decisions... Confidence intervals are analogous to two-sided hypothesis tests. If the threshold value lies outside of the interval, then there is evidence that the population parameter differs from the threshold value. In a similar manner, confidence limits can also be related to one-sided hypothesis tests. If the threshold value lies above (below) an upper (lower) confidence bound, then there is evidence that the population parameter is less (greater) than the threshold.

U.S. EPA. 2006. Data Quality Assessment: Statistical Methods for Practitioners.

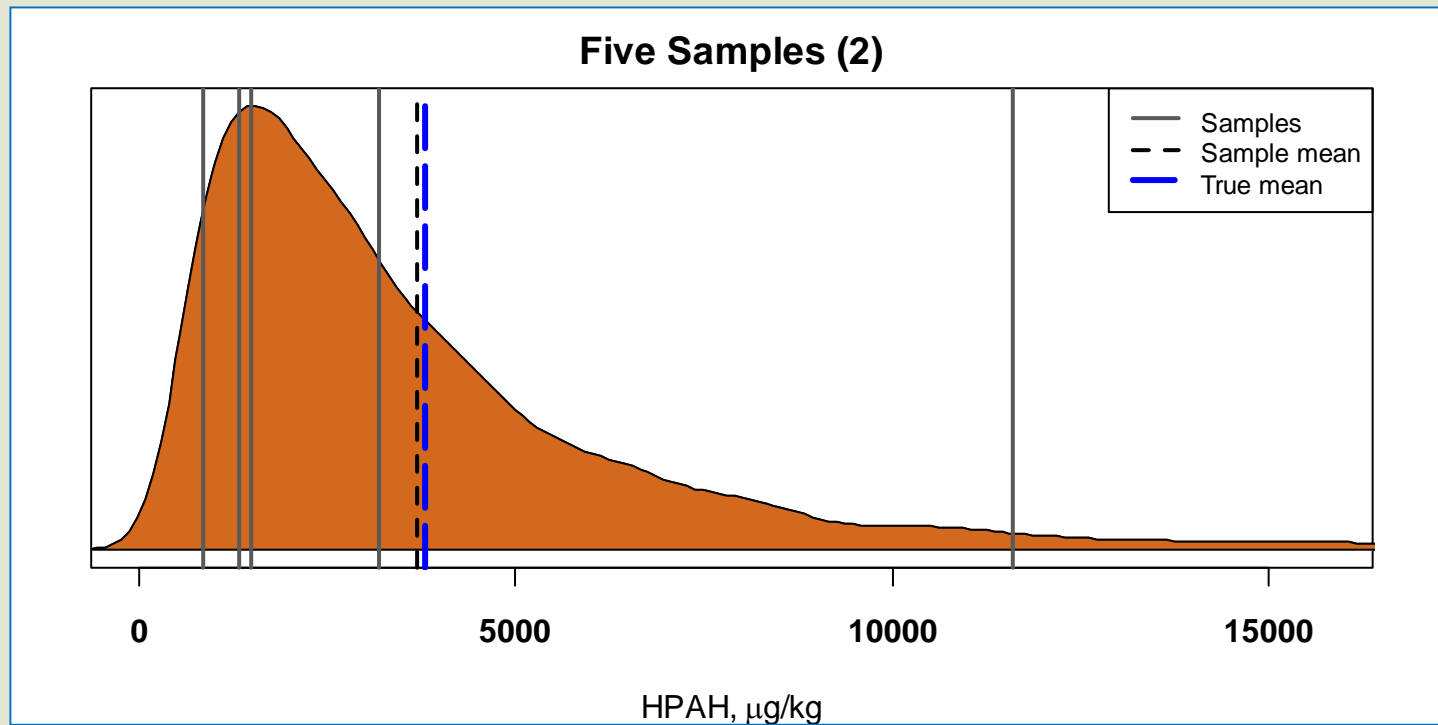
Confidence Limits on the Mean



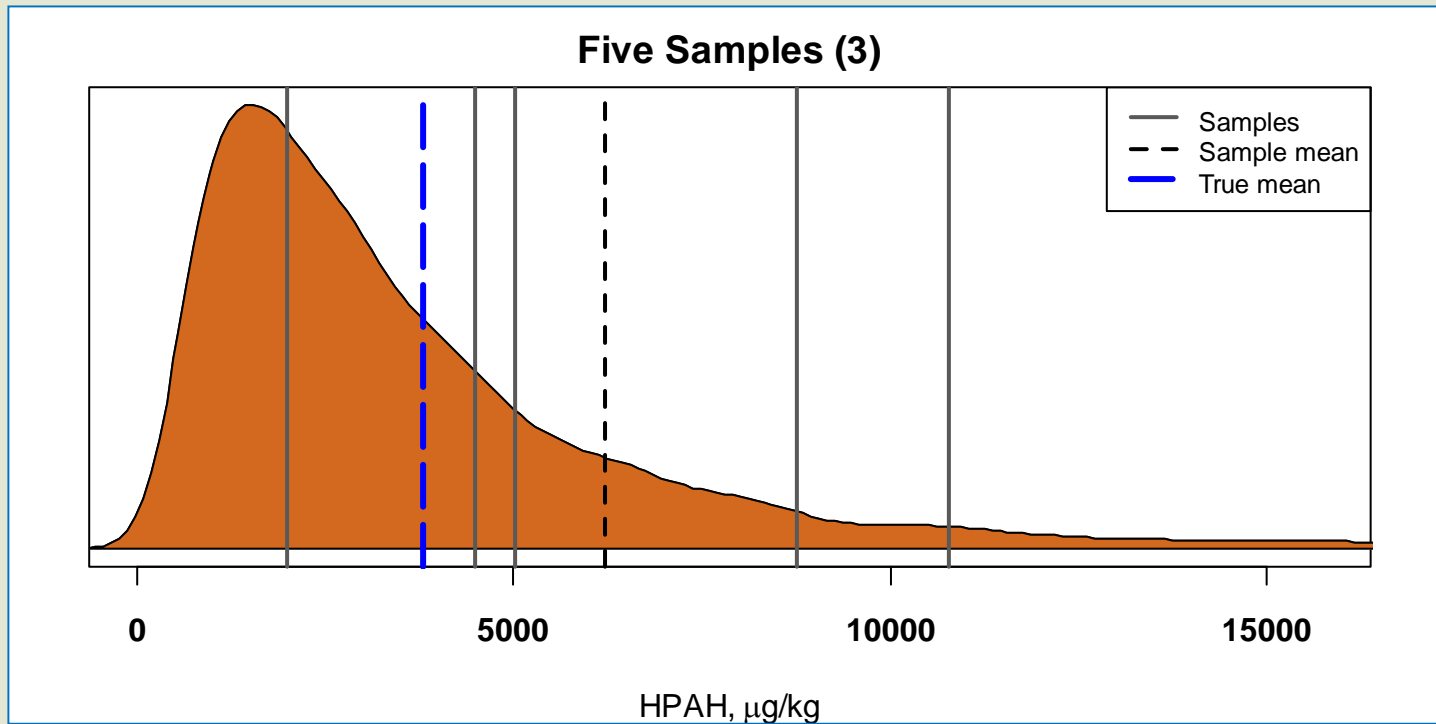
Confidence Limits on the Mean



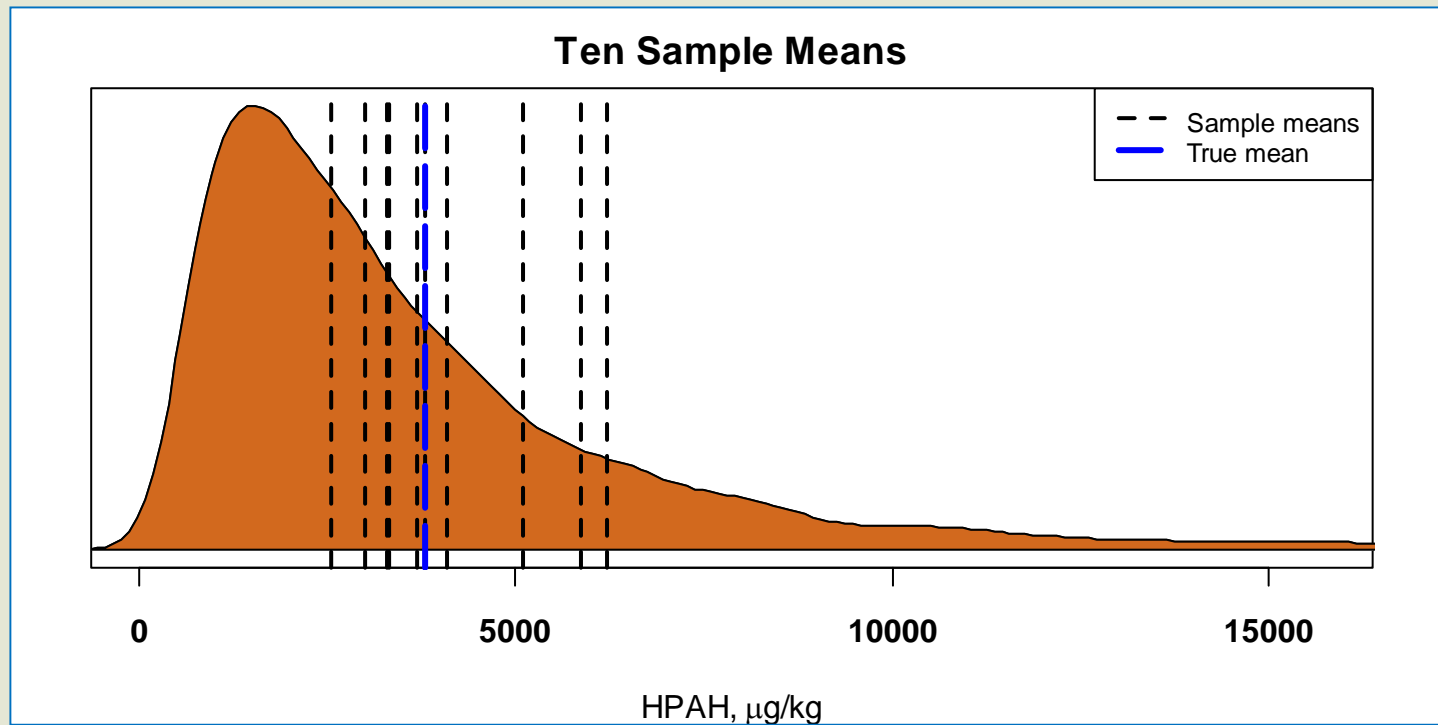
Confidence Limits on the Mean



Confidence Limits on the Mean



Confidence Limits on the Mean



Summary

- Sample concentration limit of 120% of background
 - Allows for measurement variability
 - Average concentrations expected to be below background
- SWAC limit at the upper confidence limit of the ACL
 - Allows for measurement variability
 - Consistent with EPA guidance

Cleanup Thresholds

San Diego Shipyard Site

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