

CLAM Focus Group Notes

Summary of existing studies

1) Summary of GeoEngineers Study (Bud)

a) Study summary

Kaiser has been doing comparison studies of sampling systems for awhile, including comparisons of grab samples for stormwater/wastewater, SPMDs vs. 24 hr composite sample, CLAM vs. 24 hr composite samples.

b) Results: See GeoEngineers Report

There were problems with algae plugging the upstream sample.

Figure 5 shows that the CLAM sampler flow rates are consistent and roughly linear over time up to the point where the battery system fails. Then it is an exponential drop in flow rates through sampler. This is not what was experienced in the sampling. Flow rates drops are associated with filter clogging, which could be an exponential curve.

Difference in concentrations between 24 hour composite sample and CLAM sample. Question about how AXYS was doing the analysis for the two samples. Would this account for the difference? Possible causes of losses from 24 hour composite sample during sampling include exposure to air, tubing.

c) Concerns

- Precision was good but accuracy between CLAM and 24 hr composite samples in question.
- Flow rate drop off over time did not appear to have a linear relationship, which caused problems with assessing the precision.
- Consistently higher concentrations of PCB reported for CLAM vs. 24 hour composite.
- Using CLAM in a regulatory application and pushing the innovation envelope before it is ready to be used as a method.

2) Summary of Ecology Study (Brandee)

a) Study Summary: Ecology compared the CLAM and surface water samples in the Spokane River.

b) Results: See handout and spreadsheets

TSS affected the pump rate, and drop in flow volumes was expected. Similar results have been collected by EAP at other locations.

The best way to know what the flow rate is is to capture the water coming through the sampler. There was good repeatability (i.e., good precision) between samples. Manufacturers are working on the TSS/flow issue but

c) Concerns:

- Precision good and accuracy remains question mark.

- Flow rate drops also experienced.
- 3) Other data? (Arianne)
- a) USGS report was for polar compounds only, not PCBs. They experienced break through and lower concentrations on the discs than in the water samples. Not relevant for our experience.
 - b) General comments about other data
 - Kris Holm asked if there has been a literature review for this method and volunteered to Google it. Will share with group if there is relevant information.
 - Cathy Whiting mentioned that the CA DPP in Sacramento did some CLAM work in December 2013. Doesn't know if the study is complete but will follow up and/or send contact information.
 - EAP plans to continue using the CLAM and has been using it for Toxaphene in Pine Creek, PCB in Burnt Ridge, and PCB in Wenatchee. Similar experiences with the TSS and flow rate issue. EAP remains a potential resource to support future studies.

Statement of the Problem

1) *If Confidence Interval Testing indicates . . . that the levels of PCBs are below background concentration levels,*

Then . . . we need to rethink the sampling methodology.

2) *If CLAM sampler data indicates . . . there are accuracy and flow rate concerns*

Then . . . we need to evaluate how the data is generated, analytical techniques, and flow rates.

Brainstorm Path Forward

The QAPP specifies it is not to be used for compliance purposes but concern expressed that it could be in the future. This is of concern to the regulated community.

4) Can problem be resolved with additional studies before August?

Discussion about whether the concerns can be addressed given the timeframe. However funding source is limited to this year and needs to be started in August in order to use the funding.

If Confidence Interval Testing gives good results, then this discussion is somewhat moot since 2.36 gallon water samples will be acceptable.

- 5) Given current limitations of CLAM data and water sample data, can it be used to meet objectives of the QAPP?
- a) See logic diagram. General agreement on diagram but how data will be used was not resolved.
 - b) There are differences of opinion as to how data that is below background, i.e. ND, would be used to meet the objectives of the QAPP.
 - c) There are differences of opinion as to how CLAM data that is not accurate (due to laboratory and flow rate issues) would be used to meet the objectives of the QAPP.

- d) Concern was expressed about whether/how data would be used in the future for determining compliance.
 - e) Concern was expressed that there are a number of disadvantages with the CLAM sampling, including the number of samples, costs, and logistics of sampling under low water co
 - f) It was noted that decisions made regarding sampling techniques should be solid, and based on data, and strive for long term consistency.
 - g)
- 6) Is a delay in sampling activities beneficial?

No, due to limitations on funding timeframe.

Path Forward

Recommendation and agreement that consistency in methodology is important. That is why this decision is important since it sets the path forward for future sampling efforts.

See handout, "Potential CLAM Path Forward"

Options discussed to prepare for CI testing results:

- 1) Review sampling methodology (sample size, CLAM, other options not viable at this time)
- 2) Review/address flow rate issue
- 3) Check lab methodology
- 4) Review/qualify how data is to be used to meet QAPP objectives

Action Items

- 1) Bud Leber to contact AXYS and ask about laboratory analysis methods. Is there a difference between the 24 hour analytical method and the CLAM disc analysis?
- 2) Brandee Era Miller to get more information about possible solutions to the volume question, like the bladder study and the tipping dipper. Are these techniques that can be deployed within a couple of months, if needed?
- 3) Arianne Fernandez/Ted Hamlin to test a paddle meter/CLAM set up to see if flow can be measured.
- 4) Arianne Fernandez to submit 4 liter sample to lab for analysis
- 5) Arianne Fernandez to see there is budget and if laboratory can do a comparison test of water vs. CLAM analysis using know concentrations of PCB in laboratory water. This would be a controlled test to see if laboratory analysis methods are contributing to the differences in concentrations.

Logic Diagram based on primary data concerns: Given no other alternative, can the data be used?

Objectives of QAPP
1) Collect necessary data to eliminate data gaps <ul style="list-style-type: none"> • <i>PCB sources upstream of Idaho/Washington border (Seasonally Integrated Sampling)</i> • <i>Loading from groundwater sources (Synoptic Study)</i> 2) PCB mass balance assessment

Objective	CLAM (or XAD) imprecise (Results are not repeatable)	CLAM (or XAD) biased (Results are repeatable but flow measurement not accurate)	Water Samples: concentrations too low. (Can't distinguish from lab contamination and measurement noise)
Magnitude of upstream sources	Qualitative	Qualitative	No
Loading from groundwater sources	Qualitative	Qualitative	No
Mass balance assessment	No	No	No