



# Ag Stakeholder Feedback on *C. dubia* Draft Study Report

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## CONTEXT & CONCERNS FOR AG STAKEHOLDERS (1 OF 2)

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- Tests on full-strength sample water only (no dilution)
- Large datasets with “binomial distribution” testing for impairment (based on TST results), per 303d-listing requirements... less reliance on pass/fail single-test outcomes
- However, regulatory Limits apply – stakes (consequences) for Ag dischargers are just as high
- As water quality improves, more “low-level intermittent” toxicity is expected/observed



## CONTEXT & CONCERNS FOR AG STAKEHOLDERS (2 OF 2)

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- Ag stakeholders share the concerns of other stakeholders
  - Intra/inter-laboratory variability
  - Correct identification of toxic and not-toxic samples as such (within and between labs)
- Effects of hardness...
- ... but also, effects of turbidity, DOC, and possibly other factors that differ (at least regionally) in natural stream channels AND could affect lab performance
  - Not addressed in this study
  - Of greater concern in Ag-watershed streams with low-level, intermittent toxicity



## COMMENTS TO ESP ON 4/12/21 AND THROUGHOUT PROCESS

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*“Data and methods need to travel with appropriate disclosures.”*

“and reports”

“, to ensure future use by wide audiences that is consistent with the present-day intent of those close to the data”



*From the outset...*

## **STUDY DESIGN – EXPERIMENTAL, SUGGESTING STRAIGHTFORWARD STATISTICAL COMPARISONS BETWEEN ILS1 & ILS2**

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Study Task 3 – Targeted experiments will be conducted among a few laboratories to standardize select test parameters to minimize inter- and intra-laboratory variability in test results.

Study Task 4 – A second round of split-sample interlaboratory testing will be conducted to determine if recommendations developed in Task 3 are successful in reducing inter- and/or intra-laboratory variability among a wide range of laboratories.



## THANK YOU

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- Hard work of ESP members, SCCWRP, and SWRCB staff
- Outreach to labs and large data-gathering effort with subsequent analysis
- Visualizations and review of large dataset, provided to SAC and ESP
- Timeline and budget constraints



# STATISTICAL/NUMERIC RIGOR NEEDED IN ILS1 TO ILS2 COMPARISONS

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- For any conclusions that that performance (reproduction means or CVs) in control samples was enhanced in ILS2 relative to ILS1, there needs to be statistical evaluation, or at least rigorous numeric comparisons accompanied by annotated graphics. These analyses and figures need to omit (with documentation) any data points for which a cause other than the study factors was the cause for a change in sample response between ILS1 and ILS2. For the remaining data points, was the difference numerically compelling (as opposed to “several examples of improved performance”)?
- Interpretations of changes in control reproduction data (mean and CV) between ILS1 and ILS2 need to be made in the context of each lab’s historical control data, updated through the end of ILS2. Are improved or decreased performance at any labs within the range of previously reported variability for those labs? If so, it is unlikely to be appropriate to attribute performance changes to the factors manipulated in this study.



## OTHER REQUESTS/CONCERNS (1 OF 2)

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- Stakeholders are interested in statistical analysis to compare test outcomes between a sample relative to its control, and then looking for differences between ILS1 and ILS2. If there is reluctance to provide sample-to-control statistical analysis, additional dialogue with ESP requested, including clear documentation of rationale for exclusion.
- Some labs show differing levels of reproduction and CVs between control, EPAMH, and Perrier samples. What is the ESP's sense of whether this can be evidence that lab cultures can be sensitive to water quality, even though the samples are all in the same hardness range?





## OTHER REQUESTS/CONCERNS

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- ESP thoughts on IC25 & IC50 data for the NaCl dilution series, relative to inter/intra-lab variability? A statistical or rigorous numeric analysis to support any conclusions.
- Lab B – Offered as primary example that standardization was effective, however improvements are subtle at this lab. Conclusions/findings should be supported by statistical analysis and/or a preponderance of data rather than anecdotes or examples.



## FUTURE WORK

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- What additional work/analyses would you recommend, if there was additional time and budget?
- How long would it take to implement the additional work?
- How long would it take to observe changes in lab performance and iterate so that enhanced lab performance is verified?