

# Sampling and Analysis Plans

Region 8 Tribal Watershed  
Workshop  
September 12-14, 2006

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## What is a SAP?

- It is a project proposal – provides answers to the following questions:
- Why am I sampling? – Problem Statement
- When should I sample?
- Where should I sample?
- How should I sample?
- What should I sample?

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## What is a SAP?

- Reflects what you have learned from your data gap analysis –your previous work, work done by others, and supporting data (soils, bedrock geology, hydrology, land use/land cover, etc...)
- Study will reflect elements of the overall monitoring strategy

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## SAP Evaluation – Yearly Process

- Address/document human induced changes in your watershed(s)
- Address/document climate conditions – example: were you sampling in a drought or extremely wet year?
- Co-parameters may be needed – example: hardness (metal bioavailability), pH ( $\text{NH}_4 \leftrightarrow \text{NH}_3$ ; metal solubility), temperature, stream flow (loads)

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## SAP Evaluation – Yearly Process

- Is this the best media to sample?  
Example:
- Hg – may want to measure MeHg in fish tissue in addition to or instead of the water column
- Organic compounds – may want to measure in fish tissue and/or sediment in addition to or instead of the water column

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## SAP Components

- Introduction
- Background
- Project Goals and Problem Definition
- Project Data Quality Objectives
- Sampling Rationale
- Request for Analysis
- Field Methods and Procedures
- Sample Containers, Preservation, and Storage

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## SAP Components

- Disposal of Residual Materials
- Sample Documentation
- Quality Control
- Field Variances
- Field Health and Safety Procedures

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## References

- USGS : <http://www.qcrio.org/qeo/surface-water.html>
- USGS : <http://pubs.usgs.gov/wsp/wsp2254/>
- USEPA : <http://www.epa.gov/region9/qa/pdfs/statguide.pdf>
- USGS : <http://water.usgs.gov/owq/FieldManual/>
- USEPA : <http://www.epa.gov/owm/cwfinance/106tqg07.htm>
- USEPA : [http://www.epa.gov/owow/nps/watershed\\_handbook/](http://www.epa.gov/owow/nps/watershed_handbook/)
- USEPA : [http://www.clu-in.org/download/char/SF\\_Rep\\_Samp\\_Guid\\_water.pdf](http://www.clu-in.org/download/char/SF_Rep_Samp_Guid_water.pdf)
- USEPA : <http://www.epa.gov/region9/qa/docs/sapgov.doc>

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## QAPP vs. SAP

- QAPP covers your entire program
- QAPP is a QA/QC plan not a project proposal
- SAP is a project proposal that describes how you will address a specific situation
- It is a detailed description of all aspects of project management – project goals and purpose, sample locations, sample frequency, parameters measured, field and laboratory protocols, etc...

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## QAPP vs. SAP

- It also describes how the data will be managed and used and how data quality will be evaluated
- SAP should refer back to the programmatic QAPP for the QA/QC protocols

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## Summary

- Need to have a well defined problem statement
- Sampling/study design must be well defined
- Use knowledge gained from your data gap analysis to clearly state and defend your problem statement and study design
- Field and laboratory methods must be documented
- Data entry/data management protocols must be documented

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## Summary

- Constantly plot and interpret your data and evaluate the progress of your study
- Incorporate what was learned from previous years work into the SAP
- What changes need to be made? – Can some sites be eliminated? Do parameters, sampling locations, and sampling frequencies need to be changed?

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## Summary

- Use QC data to qualify the interpretations of your environmental data. Examples:
- No modifications were needed to environmental data. Data quality is sufficient for study objectives.
- Sampling equipment and/or methods were changed due to contamination.

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## Summary

- More environmental samples were collected from site X than site Y.
- More environmental samples were collected during condition X than during condition Y.
- Some samples, sites, constituents, and time periods were not used in the interpretation of environmental samples because of high bias and (or) variability.

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## Summary

- Data for constituent Y were censored at X times the reporting limit to account for contamination.
- X milligrams per liter were subtracted from the environmental data because of consistent bias.
- Trends interpretation was qualified because of trends and changes in bias and/or variability.

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