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May 26, 1993

TO: Brett Betts, Tom Gries, SMU

FROM: Scott Breidenbach, EILS

SUBJECT: QA Review Strategy

Attached is a copy of the final version of the quality assurance review strategy for freshwater sediment data entering SEDQUAL. We have incorporated the suggestions and comments which Tom discussed with us over the phone last Thursday. As we discussed with Tom, this letter-style grading system could be adapted to other grading schemes that might be added to the SEDQUAL database later this summer.

SB:krc
Attachment

cc: Bill Yake

QUALITY ASSURANCE REVIEW STRATEGY FOR *FRESHWATER SEDIMENT DATA ENTERING SEDQUAL*

Background

To assure adequate quality of data entering into the database used to derive marine sediment quality values (SEDQUAL), two major levels of quality assurance (QA) review, QA1 and QA2 (PTI, 1989) are being conducted. A QA1 level review consists of summarizing quality control procedures used in sampling and analysis. The most time-consuming aspect of a QA1 review is tracking down the appropriate data from authors and labs. Time required to conduct a QA1 review once the data is collected is a minimum of 3 hours for a small number of samples. A QA2 level review, conducted on 10% of the samples within a survey, involves a review of all raw data from analysis including chromatograms, calibration curves, and machine response data. The concept behind a QA2 review is to be able to reproduce the final numerical results given the raw laboratory data. Within the marine version SEDQUAL, most of the current effort is being focused on raising all data to the QA1 level.

In support of the creation of freshwater sediment quality values, we will be entering freshwater sediment data into a freshwater version of SEDQUAL. Before data can be entered they must receive some kind of review to assure the overall reliability and quality. All freshwater sediment data will be evaluated to assess the overall quality of the sampling and analysis techniques employed.

QA Procedures

Two levels of quality assurance review will be used. The first review, the Basic QA review, will grade the surveys on the basis of QA data presented in the report and these grades will be added to the database (SEDQUAL) as the field assignment becomes available. This grading is based on information provided in the final reports and appendices and is designed to give an indication of overall data quality within a short time. The more rigorous QA review, level 1, will be conducted as time and money allow. Components of the basic QA review and QA1 are outlined in the attached pages. In addition, only data analyzed after 1985 will be accepted. Data qualifiers attached to individual analyses in the original survey will be preserved.

This two-step process will allow the following to be accomplished: enter data into a sediment quality database, exclude data of poor quality, have an indication of the data quality of threshold values, and conduct a more thorough review as time allows without a delay in the analysis of the data.

Basic QA Review

Within the Basic QA review, the following basic procedures and results will be sought. The basic QA review will be conducted to summarize the amount and quality of QA procedures presented in the survey report. The surveys will then be graded based on these summaries.

Acceptable Analysis methods:

- Chemistry:
  - PSEP (Puget Sound Estuary Program) protocols
  - Contract Laboratory Program (CLP) requirements
  - EPA SW 846
    - GC-MS methods for organics
    - Cold Vapor AA for mercury
    - ICP or Graphite furnace for other metals
- Bioassay:
  - ASTM methods for bioassays (including positive and negative controls)
  - PSEP (Puget Sound Estuary Program) protocols
  - For Microtox®, Microbics manual guidelines. (PSEP includes Microtox® protocols)

Minimum requirements to assess data quality:

- Sampling procedures are described
- Locational information for sampling stations is provided (preferably in Longitude/Latitude format)
- Features of Metals and Organics Analysis
  1) Laboratory method blank analysis
  2) Matrix spike analysis
     (A test on Certified Reference Material may substitute)
  3) Duplicate analysis (spike duplicate or regular analysis duplicate)
- Features of Organics Analysis only
  4) CLP specified surrogates and SW 846 specified surrogate recoveries
- Features of Bioassays Analysis
  5) Laboratory negative controls results

Data Quality Grades under Basic QA review:

On the basis of review of the report only, the following QA grades will be assigned based on their conformance to the above requirements.

QA Grade A

Report contains in-depth review of QA/QC. Accepted sampling and analytical methods (protocols) methods are described or listed. All required tests were conducted and resulting data provided. Discussion of exceptions and limitations is present.

QA Grade B

Report has a discussion of QA procedures and results, and describes or lists acceptable sampling and analysis methods. However, the report has one of the following problems:

- Does not provide QA test values,
- Lacks a required test,
- Evaluates only part of the data that the study included (*i.e.*, organics but ignores metals), or
- Fails to describe acceptable sampling and analysis methods

QA Grade C

Report has two of the problems above in level B.

Report has presented minimal QA material, but claims to have followed established protocols

QA Grade D

Report has minimal mention of QA.

QA Grade F

Report makes no mention of steps used to assure data quality or data assurance results and provides no data to assure data quality. These data will not be entered into the database unless subsequent QA 1 review validates the data.

QA 1 Review

As time allows, QA 1 review will be conducted on the surveys as outlined in the Quality Assurance manual (PTI, 1989). The top priority for QA 1 review will be surveys that included biology and chemistry data and had a good Basic QA grade. Within the QA 1 review, original lab reports will be sought. The next priority will be surveys that reported only chemistry and was graded B, C, or D (F grades for chemistry will not be pursued).

References

PTI, 1989. Data Validation Guidance Manual for Selected Sediment Variables, Draft Report. Prepared for the Washington State Department of Ecology, Olympia, WA, PTI Environmental Services, Bellevue, WA.

PTI, 1989. Puget Sound Dredged Disposal Analysis Guidance Manual, Data Quality Evaluation for Proposed Dredged Material Disposal Projects. Prepared for the Washington State Department of Ecology, Olympia, WA, PTI Environmental Services, Bellevue, WA.

PSEP, 1986. Recommended protocols for measuring environmental variables in Puget Sound. Prepared for Puget Sound Estuary Program, Tetra Tech, Inc., Bellevue, WA.