

CLARIFICATION**MODIFICATIONS TO THE CHEMICAL TESTING QUALITY ASSURANCE GUIDELINES**

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INTRODUCTION

Chemical data submitted to characterize dredged material proposed for open-water disposal at a PSDDA site must be quality-assured before it may be used for regulatory decision-making. Guidelines were established for this quality assurance (QA) review at the inception of PSDDA implementation. Attachment 1 includes all QA elements and the guideline values currently in use. This level of review is known as QA1.

PROBLEM IDENTIFICATION

Most laboratories doing PSDDA chemical analysis use modified Environmental Protection Agency Contract Lab Program (EPA CLP) methods. These methods have their own QA "control" limits for precision, matrix spike recovery and surrogate spike recovery, which have been established through interlaboratory testing. Laboratories rely on the CLP control limits to determine when data quality may be inadequate and corrective action is necessary.

In addition to the CLP limits in common use, the Puget Sound Estuary Program (PSEP) has established both "warning" limits and "action" limits for these same QA parameters. PSEP defines warning limits as "numerical criteria that serve to alert data reviewers and users to possible problems within the analytical system. When a warning limit is exceeded, the laboratory is not obligated to halt analyses, but the reported data may be qualified during subsequent QA/QC review." Action limits are defined as "numerical criteria that, when exceeded, require specific action by the laboratory before data may be reported. Action limits are intended to serve as contractual controls on laboratory performance." The terms "action limit" and "control limit" are similar and used interchangeably.

The QA limits established for use by PSDDA for QA1 purposes have been termed "control limits", the same term used by EPA CLP. The problem is that the PSDDA control limits are a mix of PSEP warning and action limits. A detailed analysis of laboratory QA/QC performance during DY 1990 was presented in the Corps' Dredged Material Evaluation Application Report (DMEAR). Since CLP limits are typically used by laboratories as control limits, the QA1 limits were treated in the DMEAR report as *warning* limits to assess their efficacy in that capacity. As warning limits, the PSDDA QA1 limits were not totally effective in screening data. The function of a good warning limit is to provide a quick check on data. To perform this function adequately the warning limits should be exceeded before any control or action limits are reached. The DMEAR analysis, comparing the number of exceedances of PSDDA limits to that of CLP limits, produced many inconsistencies for DY 1990. In numerous cases, the CLP control limits were exceeded while the PSDDA limits were not. Under these circumstances the possibility exists of overlooking exceedances of control limits because the warning limits were not restrictive enough.

Sufficient data was generated during DY 1990 to make adequate comparisons to other objective standards, such as EPA CLP. A more rational system of QA warning and action limits is needed to ensure proper evaluation of chemical testing data. Warning limits need to be established which provide effective screening mechanisms for quick checks of data sets. Inconsistencies with the PSEP protocols and EPA CLP control limits need to be rectified.

PROPOSED CLARIFICATION

Attachment 1 includes recommendations for establishing QA limits which are as consistent as possible with both PSEP and CLP. A system of warning and action limits, similar to PSEP, is adopted. In most cases, PSEP quantitative levels have been adopted as well.

For matrix spike and surrogate spike recoveries, independent warning limits were established for volatiles, semivolatiles and pesticides. These limits meet the PSEP definition of warning limits and screen data effectively relative to the EPA CLP control limits. The chemical-specific EPA CLP control limits were adopted for use as action limits for surrogate spike recoveries and for a basis of evaluation in the application of best professional judgment for matrix spike recoveries. Where certified reference materials are available for either metals or organics, the interlaboratory-derived 95% confidence interval should be used as an objective evaluation tool. This alternative is endorsed by PSEP. The recommended warning and action limits listed in Attachment 1 will be adopted for use in PSDDA QAI evaluations.

Attachment 1. PSDDA Warning and Action Limits

QA Element	Warning Limits	Action Limits
Precision: Metals: Organics:	 none 35% RPD or COV	 20% RPD or COV 50% COV or a factor of 2 for duplicates
Matrix Spikes: Metals: Organics: ¹ Volatiles: Semivolatiles and Pesticides:	 none 70-150% 50-150%	 75-125% recovery none (zero percent recovery may be cause for data rejection however) ²
Reference Materials: Metals: Organics:	 none none	 95% CI if specified for a particular CRM; 80-120% recovery if not. 95% CI for CRMs. No action limit for uncertified RMs.
Surrogate Spikes: Organics: Volatiles: Pesticides: Semi-volatiles:	 85% minimum recovery 60% minimum recovery 50% minimum recovery	 EPA CLP chemical-specific recovery limits

¹ When QA/QC becomes automated, the warning limits used within DAIS should be set at the CLP advisory limits for matrix spike duplicates for those chemicals covered under CLP.

² Rigorous control limits are not recommended due to possible matrix effects and interferences.