Click Here to Return to Appendix A.2 Contents

# APPENDIX D. TYPICAL DATA VALIDATION ACTIONS

# APPENDIX D. TYPICAL DATA VALIDATION ACTIONS FOR ANALYTICAL METHODS

The following are typical actions implemented for analytical data produced from DAS and mobile laboratory analyses:

**Holding Times:** If the holding time is exceeded, all positive results will be flagged as estimated (J) and all non-detects will be flagged as estimated (UJ). If holding times are grossly exceeded, the data may be rejected (R).

**Calibration:** If the calibration criteria are exceeded, all positive results will be flagged as estimated (J) and all nondetects may be flagged as estimated (UJ). If the calibration criteria are grossly exceeded, all non-detects may be flagged as unusable or rejected (R).

**Blanks:** If any blank contaminants are detected, an action level of 5 times the blank contaminant concentration will be set for most analytes. An action level of 10 times the blank contaminant concentration will be set for common lab contaminants. If the sample analyte concentration is greater than the action level, the concentration will be reported unqualified. If the sample analyte concentration is less than the action level, the concentration will be reported and flagged to be the qualified detection limit (U).

**PE Samples**: If the final results of the EPA performance evaluation (PE) sample are reported by EPA as "action high", all positive results will be flagged as estimated (J) and all nondetects will be reported unqualified. If the final results of the EPA-PE sample are reported by EPA as "action low", all positive results will be flagged as estimated (J) and all nondetects will be flagged as estimated (UJ). For PE samples obtained from commercial vendors, results that are above or below the 95% confidence interval will be qualified in the same manner as results(s) rated by EPA as "action high" or "action low," respectively.

**Sample Duplicate:** If laboratory or field duplicate analyses result in a relative percent difference (RPD) greater than 20% or 30%, respectively, all positive results will be flagged as estimated (J) and all nondetects will be reported unqualified. If one value is nondetected and the other is above the detection limit, all positive results will be flagged as estimated (J) and all nondetects will be flagged as estimated (UJ).

**Matrix Spike/Matrix Spike Duplicates:** If the final results of the matrix spike are greater than 20% above the true concentration, all positive results will be flagged as estimated (J) and all nondetects will be reported unqualified. If the final results of the matrix spike are greater than 20% below the true concentration, all positive results will be flagged as estimated (J) and all nondetects will be flagged as estimated (UJ). If the final results of the matrix spike are less than 10% of the true concentration, all positive results will be flagged as estimated (J) and all nondetects will be flagged as unusable or rejected (R). If the spike concentration is low relative to the native sample concentration, recovery cannot be assessed, and this will be noted accordingly in the calibration documentation.

Click Here to Return to Appendix A.2 Contents

# APPENDIX E. DATA TREATMENT

# APPENDIX E

## TREATMENT OF ANALYTICAL DATA FOR GENERATION OF DATA SUMMARY TABLES

Validated analytical data for sediment samples collected in 1997 by M&E are presented in Appendix B of this compendium, while data for sediment samples collected in 1995 by FW are presented in their Preliminary Data Compendium (FW, 1996a). The data sets used to generate the summary tables for the 1995 and 1997 sediment data used only the 26 non-reference locations sampled by M&E in 1997. None of the other non-reference locations sampled by FW in 1995 were used in summarizing the 1995 data.

The FW database provided to M&E was used to generate the data summary tables for the 1995 sediment data. The numeric values or flags or other information compiled in the database was assumed to be accurate, but was not verified.

The following criteria were applied to the validated data from both data sets:

- If a value is not flagged, the value was used as reported (a detected value)
- If a value is flagged with "J", the value was used as reported (a detected value)
- If a value is flagged with "R" or "UR", the value was considered not to exist and was not used (a rejected value)
- If the value is flagged with "U" or "UJ", the result was considered a nondetected or (an undetected) value

### FIELD DUPLICATES

Prior to using analytical data for a primary sample with an associated field duplicate, the analytical values for the primary sample and the field duplicate were averaged together (U.S.

EPA, 1989a, 1989b, and 1989c) to provide a single set of values for the field duplicate pair. The following conventions were used for averaging field duplicate samples together:

- If both samples have detected values (flagged with "J" or unflagged), both values were averaged together. If one value or both values are flagged with "J" prior to averaging, the resulting averaged value was flagged with "J"

- If both samples have nondetected values (flagged with "U" or "UJ"), the lower value and its flag were used

- If one sample has a nondetected value (flagged with "U" or "UJ" and the other sample has a detected value (flagged with "J" or unflagged) the following is done:

  - If the detected value is less than or equal to the nondetected value, the detected value and its flag were used

  - If the detected value is greater than the nondetected value, the detected value and ½ the nondetected value were averaged together. The resulting averaged value was flagged with "J"

- If one sample has a nonrejected value (flagged with "J", "U", "UJ", or unflagged) and one sample has a rejected value (flagged with "R" or "UR"), the nonrejected value and its flag were used

The field duplicate samples were averaged together prior to generating the information presented on the data summary tables.

## DATA SUMMARY TABLES

The information presented in each of the summary tables in Section 4.0 includes either the range of detection limits (1997 data) or the range of nondetected values (1995 data), the frequency of detections, the range of detected concentrations, and the location of the maximum concentration for each analyte that was detected in at least one sample. The following text further defines how the analytical data were used to provide the information for the summary tables.

**Range of Detection Limits**

For the 1997 data, the range of detection limits was determined based on the individual sample-specific detection limit (SSDL) for each analyte. Because of different sample dilutions or weights and/or percent solids or moisture , laboratory detection limits for individual samples can be higher than the method specified detection limits. Minimum and maximum SSDLs were determined for each analyte using each sample's SSDL for all samples analyzed, regardless of whether the analyte was detected in any particular sample.

**Range of Nondetected Concentrations**

For the 1995 data, the FW database did not provide the SSDLs. Instead, the range of nondetected values was determined for this data set, if at least one analyte was reported as nondetected in one sample. Generally, the nondetected value is the SSDL, as it takes into account sample dilutions and weights and percent solids or moisture. If an analyte was detected in all samples, then nondetected values were not available.

**Frequency of Detection**

The frequency of detection is the number of samples with detected values per the number of samples analyzed. The number of samples with detected values was determined by totaling all samples with detected values (flagged with "J" or unflagged). The number of samples analyzed was determined by totaling all samples with detected or nondetected values (flagged with "U", "UJ", "J", or unflagged). Rejected values (flagged with "R" or "UR") were not included in the total number of samples analyzed. The mean of the field duplicate sample and corresponding sample was included when determining the number of samples analyzed and the number of detected values.

**Range of Detected Concentrations**

The range of detected concentrations is defined as the minimum and maximum values of all detected values (flagged with "J" or unflagged).

**Location of Maximum Concentration**

This is the location that has the highest detected value (flagged with "J" or unflagged) for a non-background sample.