

**Data Acceptability Criteria for Volatile Organic Analytes (including VOC's, MTBE, BTEX) in Water**

Sample Type	Objective	Frequency of Analysis	Recommended Control Limits	Recommended Corrective Action
<b>Internal Calibration Method</b> Calibration Standard (minimum of 5 levels over the expected range of sample target analyte conc., with the lowest conc. Std at or near the MDL).	Full calibration: Establish relationship between instrument response and target analyte conc.	Follow manufacturer's or procedures in specific analytical protocols. A min. 5 point calib.: Each set up, major disruption, and when routine calib check exceeds specific control limits.	% RSD for CCCs <30%. RF for SPCCs >0.1 except 1,1,2,2-tetrachloroethane which is 0.3.	Determine cause and take appropriate corrective action. Recalibrate and reanalyze all suspect samples or flag all suspect data.
<b>Calibration Verification</b> Calibration Check Standard (minimum of one mid-range standard prepared independently from initial calibration standards).	Verify calibration.	Mid-level calibration run every 12 hours.	RF for SPCCs same as initial calibration. RF of CCCs must be <20% difference from initial calibration.	Determine cause and take appropriate corrective action. Recalibrate and reanalyze all suspect samples or flag all suspect data.
<b>Method Detection Limit Determination</b> Spiked matrix sample (analyte-free water samples to which known amounts of target analytes have been added; one spike for each target analyte at 3-10 times the estimated MDL).	Establish or confirm MDL for analyte of interest.	Seven replicate analyses prior to use of method. Re-evaluation of MDL annually.	Determined by program manager.	Redetermine MDL.
<b>Accuracy and Precision Assessment</b> Reference material (SRMs or CRMs, covering the range of expected target analyte conc).	Assess method performance (initial method validation and routine accuracy assessment).	Method validation: As many as required to assess accuracy and precision of method before routine analysis of samples. Routine accuracy assessment: one (preferably blind) per 20 samples or one batch.	Measured value <95% confidence intervals, if certified. Otherwise, %Recovery = 50-150%.	Failure of any of the accuracy and precision control limits require the following: Determine cause and take appropriate corrective action. Recalibrate and reanalyze all suspect samples or flag all suspect data.
Matrix spike (field water samples to which known amounts of target analytes have been added: 5 times the concentration of the analyte of interest or 10 times the MDL).	Assess matrix effects and accuracy (%Recovery) routinely.	One per 20 samples or one per batch, whichever is more frequent.	%Recovery = 50-150% or Control Limits based on 3x the standard deviation of laboratory's actual method recoveries.	See Reference Materials Corrective Action. Zero percent recovery requires rejection of all suspect data.
Matrix spike replicate (replicate aliquots of matrix spike samples; 5 times the concentration of the analyte of interest or 10 times the MDL).	Assess method precision routinely.	One duplicate per 20 samples or one per batch, whichever is more frequent.	RPD <25% for duplicates.	See Reference Materials Corrective Action.
Field Replicate (replicate aliquots of water field samples).	Assess method precision routinely. Assess total variability (i.e., population variability, field or sampling variability, and analytical method variability).	5% annual rate (5% of total number of field samples per analytical procedure per year, rounded up to nearest whole number).	RPD <25% for duplicates.	Determine cause and take appropriate corrective action. Recalibrate and reanalyze all suspect samples or flag all suspect data.

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<b>Contamination Assessment</b> Laboratory Blank (method, processing, bottle, reagent).	Assess contamination from equipment, reagents, etc.	One method blank per 20 samples or one per batch, whichever is more frequent.	Blanks <MDL for target analyte.	Determine cause of problem (e.g., contaminated reagents, equipment), remove sources of contamination, and reanalyze all suspect samples or flag all suspect data.
Field Blanks, Travel Blanks, Equipment Blanks.	Assess contamination from equipment, from air, from surrounding environment, etc.	One field blank and one travel blank is required per 20 (or less) field samples collected for volatile organic analytes in water for each sampling "event".	Blanks <MDL for target analyte.	Determine cause of problem (e.g., equipment contamination, improper cleaning, exposure to airborne contaminants, etc.), remove sources of contamination, & reanalyze all suspect samples or flag all suspect data.
<b>Routine Monitoring of Method Performance for Organic Analysis</b> Surrogate Spike (Prepared from chemicals of similar structure to target analytes or isotopically labelled target analyte).	Assess method performance and estimate recovery of target analytes analyzed by GC or GC/MS. Determine RRF's of organic target analytes quantitated by isotope dilution techniques.	Performed in every calibration standard, field sample, and blank analyzed for organics by GC or isotope dilution GC-MS; added to samples prior to extraction.	Determined by program manager.	Determine cause of problem (e.g., incomplete extraction or digestion, contamination, inaccurate preparation of internal standard), take appropriate corrective action, and reanalyze all suspect samples or flag all suspect data.
<b>External QA Assessment</b> Accuracy-based performance evaluation samples submitted to new laboratories by SWAMP QA Program.	Initial demonstration of laboratory capability.	Once prior to routine analysis of field samples.	Determined by study manager.	Determine cause of problem and reanalyze sample. Do not begin analysis of field samples until laboratory initial capability is clearly demonstrated.
Mandatory interlaboratory exercises overseen by 3rd party external ("referee") SWAMP QA Program officials for all SWAMP participant laboratories.	Ongoing demonstration of laboratory capability.	One exercise per year.	Determined by study manager.	Determine cause of problem and reanalyze sample. Further corrective action to be determined by QA manager.
Voluntary, but encouraged, participation in NOAA-NIST intercalibration studies and CA-ELAP annual performance evaluations, as appropriate.	Ongoing demonstration of laboratory capability.	One exercise per year.	Determined by study manager.	Determine cause of problem and reanalyze sample. Further corrective action to be determined by QA manager.
<b>General Provisions</b>				
Acceptable Data Set: CCV Recoveries must be within control limits, & either SRM or Spiked Matrix recoveries must also be within control limits.				