

PM 2.5 SPECIATION FILTER SAMPLING

DATA HANDLING AND VALIDATION

Chain of Custody (COC) Field Data Sheets

The COC data sheets are mailed to Headquarters at the same time the sampling modules are sent to RTI. The downloaded data from each sampling event is sent to Headquarters at least every two weeks and maintained as an Excel file. The data entered on the COC sheets is compared for accuracy at Headquarters with the received downloaded data from the sampler for each sampling event. The temperature, pressure and flow data are also checked for reasonableness and the presence of flags. The COC sheets are filed and kept for comparison with the RTI reported Batch analysis data. The downloaded Excel files are archived.

Data Validation

Research Triangle Institute (RTI) is responsible for Level 0 and Level 1 data validation.

Level 0 validation includes the following:

1. Verification of COC sheets for correct module usage and sample date.
2. Double entry of the information on the COC and coding forms. Scanning the COC for inconsistencies.
3. Automatic screening for criteria that are required to be within specified limits – flow rate, retrieval time after sampling, temperature difference, flow CV, sampling time, holding time before sampling, holding time before final weighing.
4. Laboratory validation, depending on analysis, of blanks, standards, duplicates and calibration checks.

Level 1 validation is used to identify samples for further investigation. Initially, mass balance and ion ratio checks will be performed. Samples identified for further analysis will be the approximately 1% with the highest and the 1% with the lowest difference between gravimetric mass and calculated mass concentration. Also, samples with the highest 1% and lowest 1% ion ratio will be further examined.

A senior scientist at RTI performs a final data review after Level 0 and Level 1 validation to investigate anomalous samples, evaluate data completeness and check for internal consistency.

Validation by Monitoring Agency (DAQ)

The monitoring agency conducts a data review for two purposes:

1. To review and assess the data and the validation flags applied by RTI.
Changes to the data or disagreements with the validation criteria are reported to RTI for correction before the data is uploaded to AQS.
2. To look at any other validation criteria based on knowledge of site conditions, calibration results and audit reports.

Guidelines for review of the data include consideration of the following:

- Confirmation of site, date, and explanation when a sample is flagged as invalid
- Reasonableness of other flagged data based on operations records
- Calibration or audit data from regular field checks that might affect validity status of the data

Procedure for review of data and validation flags

DAQ/Ambient Monitoring is notified by the Delivery Order Project Officer (DOPO) that Batch results from RTI have been placed on the website for retrieval. Any comments or corrections of the Batch results must be submitted to RTI through the DOPO within 45 days of the Batch date.

1. Download data files from the website to designated folder.
Files are: Report.rtf – Rich text format - all reported data and flags – human readable hardcopy report for detailed review of the data
Spreadsheet.xls – spreadsheet with all reported data and flags for importing into database
MassSummary.xls – spreadsheet summary of valid analyte mass data (1 row/sample)
Conc.Summary.xl – spreadsheet summary of valid analyte concentration data (1 row/sample)
RCVD-Temperatures – text file showing temperature of cooler received by RTI

2. Open the Report.rtf file. For each sampling event:
 - a) Match the Field Custody Number to the Sample number in the top left corner of the COC sheet.
Put the RTI Batch Number in the top right corner of the COC sheet.
 - b) Spot check the Field Sampling Data with the data recorded on the COC sheet for each channel.
Note any changes that need to be made in RTI's report.
 - c) Verify any Level 0 and Level 1 flags and AQS codes assigned by RTI.
Note any that should be changed.
 - d) Keep a tally sheet in each folder which notes the particular flags assigned to each sample date. Note on this sheet the total number of samples analyzed for each Batch.

There are three categories of flags assigned by RTI. These are:

1. Flags resulting in a Null Value Code in AQS. The data are invalid and the Null Value Code overwrites the data.
 2. Flags resulting in Validity Status Code in AQS. The data are questionable but will not be overwritten.
 3. Informational flags not reported in AQS, such as for unusual mass balance or anion/cation ratios, which could prompt further investigation.
3. Complete the Data Review and Change Submission Form (Review Form.wpd) if any changes need to be reported to RTI. Note that the Chain of Custody ID No. (Field Custody Number) must be used to identify the set of filters whose data or data flags are in question. The Form is e-mailed to the DOPO who then sends it on to RTI. Keep a copy of the completed Form for each Batch.
 4. View the data using the SVDAT program. The Species Distribution Analyses are very useful.

NOTES ON USING SPECIATION DATA VALIDATION ANALYSIS TOOL (SDVAT)

Following are steps to workaroud a problem importing data into SDVAT. The procedure was developed by RTI and involves insertion of a “dummy”.

1. Open Excel 2000. Under file types select **All Microsoft Excel Files**.
2. Open the Batch Spreadsheet file. **Spreadsheet.xls**
3. Open the file **HeaderRowForImport.xls**.
4. Insert a row under the header of the **Spreadsheet.xls** file.
5. Copy the first data row (Row2) of the **HeaderRowForImport.xls** file.
6. Paste the row in the inserted row of the **Spreadsheet.xls file**.
7. Save the new file with the “dummy” row under a new name;
Example: B0028Spreadsheetdummy.xls
8. Open Access 2000 and import the file with the “dummy” row.
9. Consult the User’s Guide for detailed instructions on using SDVAT for data analysis.