UCD CSN Standard Operating Procedure #901

Long-Term Archiving of Filters

Chemical Speciation Network
Air Quality Research Center
University of California, Davis

September 28, 2017
Version 1.0

Prepared By: [Signature] Date: 10/10/17

Reviewed By: [Signature] Date: 10/16/2017

Approved By: [Signature] Date: 10/14/17

UCDAVIS
AIR QUALITY RESEARCH CENTER
## DOCUMENT HISTORY

<table>
<thead>
<tr>
<th>Date Modified</th>
<th>Initials</th>
<th>Section/s Modified</th>
<th>Brief Description of Modifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table of Contents
1. PURPOSE AND APPLICABILITY ....................................................................................... 4
2. SUMMARY OF THE METHOD .......................................................................................... 4
3. DEFINITIONS .................................................................................................................... 4
4. HEALTH AND SAFETY WARNINGS .............................................................................. 4
5. CAUTIONS ....................................................................................................................... 4
6. INTERFERENCES .............................................................................................................. 4
7. PERSONNEL QUALIFICATIONS, DUTIES, AND TRAINING ......................................... 4
8. ARCHIVING CONDITIONS .............................................................................................. 4
   8.1 Quartz Filters ............................................................................................................... 4
   8.2 Teflon Filters ............................................................................................................. 5
   8.3 Nylon Filter Extracts ................................................................................................ 5
9. PROCEDURE FOR ARCHIVING FILTERS ...................................................................... 5
   9.1 Sample Shipping and Receiving ................................................................................ 5
   9.2 Teflon Filters – Archive Labels ............................................................................... 5
   9.3 Teflon Filters – Full Trays ....................................................................................... 6
10. PROCEDURE FOR REMOVING FILTERS FROM ARCHIVING ..................................... 7
   10.1 Identify Samples ...................................................................................................... 7
   10.2 Locate Samples ....................................................................................................... 8
   10.3 Return Samples to Archive .................................................................................... 8
11. EQUIPMENT AND SUPPLIES ...................................................................................... 8
12. QUALITY ASSURANCE AND QUALITY CONTROL .................................................... 8
13. REFERENCES .................................................................................................................. 8

List of Figures
Figure 1. Filter label (same as ContractorFilterAnalysisID). ................................................... 6
Figure 2. Petri tray label ...................................................................................................... 6
Figure 3. Archive box label ............................................................................................... 6
Figure 4. Tray list ............................................................................................................... 7
Figure 5. Information needed to retrieve archived sample. ................................................... 8
1. PURPOSE AND APPLICABILITY

This standard operating procedure (SOP) describes the process for archiving samples (Teflon and quartz filters, and extracts of nylon filters) analyzed under the EPA Chemical Speciation Network (CSN) contract.

2. SUMMARY OF THE METHOD

Filter samples collected for the CSN network are archived under specific conditions for potential reanalysis. This method describes the documentation and sample handling practices necessary to maintain sample integrity.

3. DEFINITIONS

- **Chemical Speciation Network (CSN):** EPA’s PM$_{2.5}$ sampling network, with sites located principally in urban areas.

4. HEALTH AND SAFETY WARNINGS

Not applicable.

5. CAUTIONS

Not applicable.

6. INTERFERENCES

Not applicable.

7. PERSONNEL QUALIFICATIONS, DUTIES, AND TRAINING

The AQRC laboratory staff assigned to this project all have advanced training in laboratory practices. All have direct experience through recent involvement in similar sample handling and archiving activities for IMPROVE.

8. ARCHIVING CONDITIONS

8.1 Quartz Filters

Quartz filters are archived for the life of the contract in petri-slide holders. Full petri-slide trays of quartz filters are placed in heavy-duty plastic zippered bags and plastic boxes for storage in a refrigerator or cold room maintained at or below 4°C (but not below freezing).
Quartz filters from previous CSN contracts are stored by UC Davis (off-campus at cold storage facility in Sacramento). For the current contract, quartz filters are stored by the carbon analysis laboratory subcontractor (Desert Research Institute; Reno, Nevada).

8.2 Teflon Filters

Teflon filters are archived for the life of the contract, sorted by ContractorBatchNumber, IntendedUseDate, ContractorSetNumber, and ContractorFilterAnalysisID into petri-slide trays. Full trays are placed in heavy-duty plastic zippered bags and plastic boxes (36 trays per box) for storage in a refrigerated room. Individual filters are located by box number, batch number, tray number and ContractorFilterAnalysisID.

Teflon filters from the current and previous CSN contracts are stored on-campus at UC Davis. For the first five years, Teflon filters are stored at or below 4°C (but not below freezing), and are housed in the UC Davis Food Sciences building. After that time, samples are stored at room temperature in the UC Davis storage facility (Cobalt Building).

8.3 Nylon Filter Extracts

Nylon filter extracts are archived for six months in extraction vials. They are grouped in laboratory batches, and placed in heavy-duty plastic zippered bags and plastic bins for refrigerated storage maintained at or below 4°C (but not below freezing).

Filter extracts are stored by the ions analysis laboratory subcontractor (Desert Research Institute; Reno, Nevada).

9. PROCEDURE FOR ARCHIVING FILTERS

9.1 Sample Shipping and Receiving

Refer to DRI SOP and UCD TI for shipping and receiving:

DRI SOP #2-117: Filter Pack Sample Shipping, Receiving and Chain –of-Custody
UCD TI #302B: Receiving and Inventorying of CSN Samples

9.2 Teflon Filters – Archive Labels

Filter Labels: Filter labels are generated by Amec and correspond to the ContractorFilterAnlaysisID. Labels have a barcode and text (Figure 1), and may be located on the front or back of the petri slide.
Figure 1. Filter label (same as ContractorFilterAnalysisID).

**Petri Tray Labels:** The operator prints unique petri tray labels after inventory. The labels include the ContractorBatchID, tray number, and QR barcode for each petri tray (Figure 2). Only the last two digits of the ContractorBatchID are used for the label (e.g. A0000019).

Figure 2. Petri tray label.

**Archive Box Labels:** The archive box label includes the box name, the range of trays, and QR barcode (Figure 3). The box range is indicated as Batch XX Tray XX – Batch XX Tray XX.

Figure 3. Archive box label.

**9.3 Teflon Filters – Full Trays**

Once a tray is full, the TrayID is associated with the box number. Thirty-six trays are assigned to each box number, and a list of trays (including archive date and operator initials) is generated for each box (Figure 4).

Filters remain in trays in the archive boxes until they are logged out or removed (e.g. returned to a state, turned over to EPA, etc).
10. **PROCEDURE FOR REMOVING FILTERS FROM ARCHIVING**

10.1 **Identify Samples**

- Search the database to identify the ContractorFilterAnalysisIDs of the filters.
- In the records, find the box number, batch number, tray number, and the position number for the specific sample (Figure 5).
Figure 5. Information needed to retrieve archived sample.

<table>
<thead>
<tr>
<th>POS</th>
<th>Box #</th>
<th>Batch/Tray</th>
<th>ContractorFilterAnalysisID</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>4</td>
<td>Batch 10 Tray 15</td>
<td>F019620</td>
</tr>
<tr>
<td>47</td>
<td>4</td>
<td>Batch 10 Tray 16</td>
<td>F020808</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>Batch 10 Tray 18</td>
<td>F020202</td>
</tr>
</tbody>
</table>

10.2 Locate Samples
- Locate the archive bin(s) containing the sample(s).
- Within the archive bin, locate the tray containing the sample(s).
- Within the tray, locate and remove the individual samples to be removed.

10.3 Return Samples to Archive
- Return the samples to archive by placing the samples in the correct box, tray, and position. Check the database for the information needed.
- Insert appropriate notes/comments (if needed) about sample integrity.

11. EQUIPMENT AND SUPPLIES

Archival of samples makes use of petri slides, slide trays, and archive bins. These holders are available commercially from multiple scientific product vendors.

12. QUALITY ASSURANCE AND QUALITY CONTROL

Not Applicable.

13. REFERENCES

Not Applicable.