

# UCD CSN Standard Operating Procedure #901

## Long-Term Archiving of Filters

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

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### DOCUMENT HISTORY

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11/30/18	NJS	All	Rewording for clarity and reformatting to be consistent with all other SOPs.
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## 1. PURPOSE AND APPLICABILITY

This standard operating procedure (SOP) describes the procedure for long-term archiving of 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<sub>2.5</sub> 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 Air Quality Research Center (AQRC) laboratory staff assigned to this project have been trained on this SOP.

## 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 a cold storage facility in Sacramento, California. 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*. For the current contract, quartz filters are stored at the UC Davis Buckeye Cottage.

## 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 (current contract), Teflon filters are stored at or below 4°C (but not below freezing), and are housed in the UC Davis Sprocket building and UC Davis Buckeye Cottage. After that time, samples are stored at room temperature in the UC Davis storage facility (Surge 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 (RTI; Research Triangle Park, North Carolina).

# 9. PROCEDURE FOR ARCHIVING FILTERS

## 9.1 Sample Shipping and Receiving

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

*UCD TI #302B: Receiving and Inventorying of CSN Samples*

*RTI SOP: Determination of Anions and Cations Extracted from Nylon Filters by Ion Chromatography (IC)*

## 9.2 Generating Archive List

The CSN Archive list is an electronic list of the samples in a Petri tray. The Archive list is filter type specific that includes the following information for each sample; the position number, FilterID, BarcodeID, Intended Use Date, Set, Batch, type, Purpose, Null code, and Manufacturer number (for Teflon filters only).

### 9.2.1 Filter Archive Boxes

1. Write down the Batch and Tray numbers for which an archive list needs to be generated.

2. Log-in to the CSN webapp at <https://csn.crocker.ucdavis.edu>. Request permissions from Data Management group and/or IT support, if necessary.
3. From the CSN Webapp main menu select “Archive.” This will open the list of all previously generated archive boxes for Teflon filters.
4. Select the **Quartz** tab to generate trays for quartz filters.

### 9.2.2 Create a New Archive Box

1. From the open window, Filter Archive Box, click on **Add Box**. Select the Year, and Box Label. Please select the Year the samples are collected. If the boxes will include samples from multiple years then select the Year of the oldest sampling date.
2. Type the box number: the box number is one number higher than the preceding box. Note the box number does not restart with a sampling year.
3. Next, The Box Label is in format CSN Box #.
4. Click **create** when done, then continue to Add Trays.

### 9.2.3 Add a New Tray

1. Select **Add Tray**.
2. Type the filterID for the first filter in the tray. Then click **Select**.
3. Preview the samples in the box, if this looks good, then type the “TrayLabel” in format CSN Batch ## Tray ##, e.g. CSN Batch 18 Tray 7.
4. Select **Create**.
5. Review the Tray list and verify the samples are in the correct order.

### 9.2.4 Edit Tray list

In general, the majority of the electronic tray lists will agree with the physical order of the trays and no additional action will be required. Exceptions include double filters, delayed samples or samples missing from shipment by Wood PLC (formerly Amec).

1. To insert a sample, select **Insert Above** the sample will be inserted in the position above the selected record.
2. To remove a sample, select **remove** that will remove the selected record and leave the position empty
3. To add a filter to empty position, select **Add filter** that will open “Add Filter to Tray” window in the space available type the BarcodeID. Add the filter by clicking **select**.
4. To shift sample up, click the button **^ Up** that will move the record up one position. **^ Up** will also work to fill an empty position and leave position “50” empty.

5. To shift sample down, click the button ∨ **Down**. Each click will move the record down one position.

### 9.2.5 Archive date

Update the archive date and operator initials for each tray within the Archive Box.

1. Select the **Archive** submenu in the CSN Webapp.
2. Select details for the box. This will populate a complete list of trays within the box.
3. Select details for the tray. This will populate a complete list of the samples within the tray.
4. From the upper right hand corner select **Edit**, then update the Date and operator initials.
5. Continue with the procedure until all trays have been updated.

### 9.3 Teflon/Carbon Filters – Archive Labels

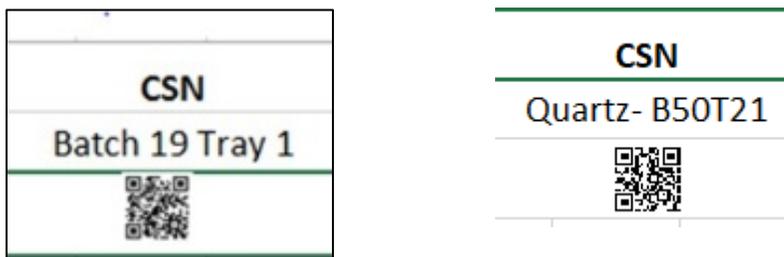
**Filter Labels:** Filter labels are generated by Wood PLC and correspond to the *ContractorFilterAnalysisID*. Labels have a barcode and text (Figure 1), and may be located on the front or back of the petri slide.

Figure 1. Filter label (same as *ContractorFilterAnalysisID* and *BarcodeID*).



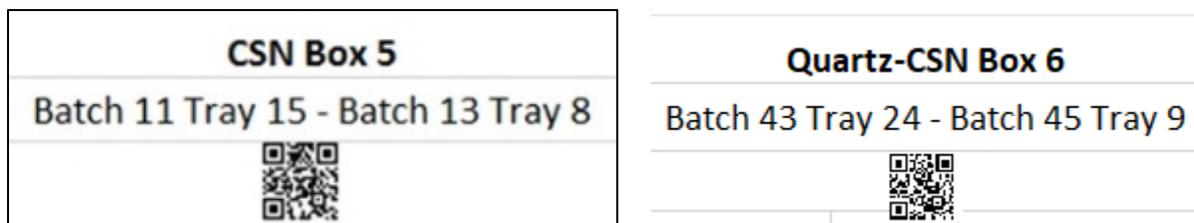
**Petri Tray Labels:** The operator prints unique Petri tray labels after inventory. The labels include the *ContractorBatchID*, tray number, and QR barcode for each petri tray (Figure 2). Only the last two digits of the *ContractorBatchID* are used for the label (e.g. A0000019 is Batch 19). To differentiate between Teflon and Quartz trays add “Quartz” to the tray label, eg Quartz- B19T1.

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*. To differentiate between Teflon and Quartz boxes add “Quartz” to the box label, eg Quartz- CSN Box 6.

Figure 3. Archive box label.



#### 9.4 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.).

Figure 4. Partial Tray list for CSN Box 5.

**Box Details**

SetYear	2016	Created	3/13/2017 1:42:13 PM	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
Box Number	5	CreatedBy	marigaby		
BoxLabel	CSN Box 5				

**Trays**

Tray number	Tray label	Filters	
1	Batch 11 Tray 15	50	<a href="#">Details</a>
2	Batch 11 Tray 16	50	<a href="#">Details</a>
3	Batch 11 Tray 17	50	<a href="#">Details</a>
4	Batch 11 Tray 18	50	<a href="#">Details</a>
5	Batch 11 Tray 19	50	<a href="#">Details</a>
6	Batch 11 Tray 20	50	<a href="#">Details</a>
7	Batch 11 Tray 21	49	<a href="#">Details</a>
8	Batch 11 Tray 22	50	<a href="#">Details</a>
9	Batch 11 Tray 23	50	<a href="#">Details</a>
10	Batch 11 Tray 24	50	<a href="#">Details</a>
11	Batch 11 Tray 25	50	<a href="#">Details</a>
12	Batch 11 Tray 26	50	<a href="#">Details</a>
13	Batch 11 Tray 27	50	<a href="#">Details</a>
14	Batch 11 Tray 28/ Batch 12 Tray 1	50	<a href="#">Details</a>
15	Batch 12 Tray 2	50	<a href="#">Details</a>
16	Batch 12 Tray 3	50	<a href="#">Details</a>
17	Batch 12 Tray 4	50	<a href="#">Details</a>

### 9.5 Transportation Conditions

Pack the Archive box with ice pack to keep the temperature between 0-4 ° Celsius during transportation. Remove the ice packs after placing the box in the refrigerator.

## 10. PROCEDURE FOR REMOVING FILTERS FROM ARCHIVING

### 10.1 Identify Samples

1. Search the database to identify the *ContractorFilterAnalysisIDs* of the filters.
2. 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.

POS	Box #	Batch/Tray	ContractorFilterAnalysisID
50	4	Batch 10 Tray 15	F019620
47	4	Batch 10 Tray 16	F020808
8	4	Batch 10 Tray 18	F020202

## **10.2 Locate Samples**

1. Locate the archive bin(s) containing the sample(s).
2. Within the archive bin, locate the tray containing the sample(s).
3. Within the tray, locate and retrieve the individual samples.

## **10.3 Return Samples to Archive**

1. Return the samples to archive by placing the samples in the correct box, tray, and position. Check the database for the information needed.
2. 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**

*UCD TI #302B: Receiving and Inventorying of CSN Samples*

*RTI SOP: Determination of Anions and Cations Extracted from Nylon Filters by Ion Chromatography (IC)*