

UCD CSN Technical Information #402A

Receiving and Inventorying of CSN Samples

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Air Quality Research Center
University of California, Davis*

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1. PURPOSE AND APPLICABILITY

The subject of this technical information document (TI) is receiving and inventorying of Quartz samples collected for the Chemical Speciation Network (CSN). The scope is to ensure good laboratory practices of receiving samples by checking condition and amounts in conjunction with chain-of-custody forms, in addition to inventorying and preparing samples for carbon analysis.

2. SUMMARY OF THE METHOD

After sampling, quartz filters are initially processed at WOOD PLC for sample handling before shipping to UCD for analysis. The operator receives the coolers of filters and performs an inventory of the received items, cross-checking with the accompanying chain of custody form.

3. DEFINITIONS

Inventory: The list includes the number of samples received, condition, type of filter (sample, lab blank, field blank etc.) that shall be used to determine the samples to be analyzed by Carbon analyzers as well as analysis order.

COC: Chain of custody form; the COC is received with the samples including the list, amount, sample type, etc.

Analysis Request ID: WOOD PLC assigns a batch number to each shipment of filters, e.g., A0000001. Other names include Batch ID, and ContractorBatchNumber.

Filter Analysis ID: WOOD PLC assigns a barcode to each sample format F#####, e.g. F000002. Other names include Barcode ID, and ContractorFilterAnalysisId.

SampleId (Id): The number assigned to the electronic record in CSN database.

CSN Data Management Site: User interface web application for the CSN database (*csn.crocker.ucdavis.edu*).

Operator: Authorized personnel responsible for processing CSN samples; must receive prior approval from the Lab Manager. The operator shall have access to Jungerman Hall rooms 116 and 120A where the Carbon analyzers and refrigerators are located.

Wood: short for WOOD PLC, is the EPA subcontractor for sampling handling including deployment of filters, sample processing, and electronic record delivery and shipping samples to UC Davis.

4. HEALTH AND SAFETY WARNINGS

Not applicable.

5. CAUTIONS

Not applicable.

6. INTERFERENCES

Not applicable.

7. PERSONNEL QUALIFICATIONS, DUTIES, AND TRAINING

Only trained lab personnel designated by the Laboratory Manager may receive and inventory CSN samples.

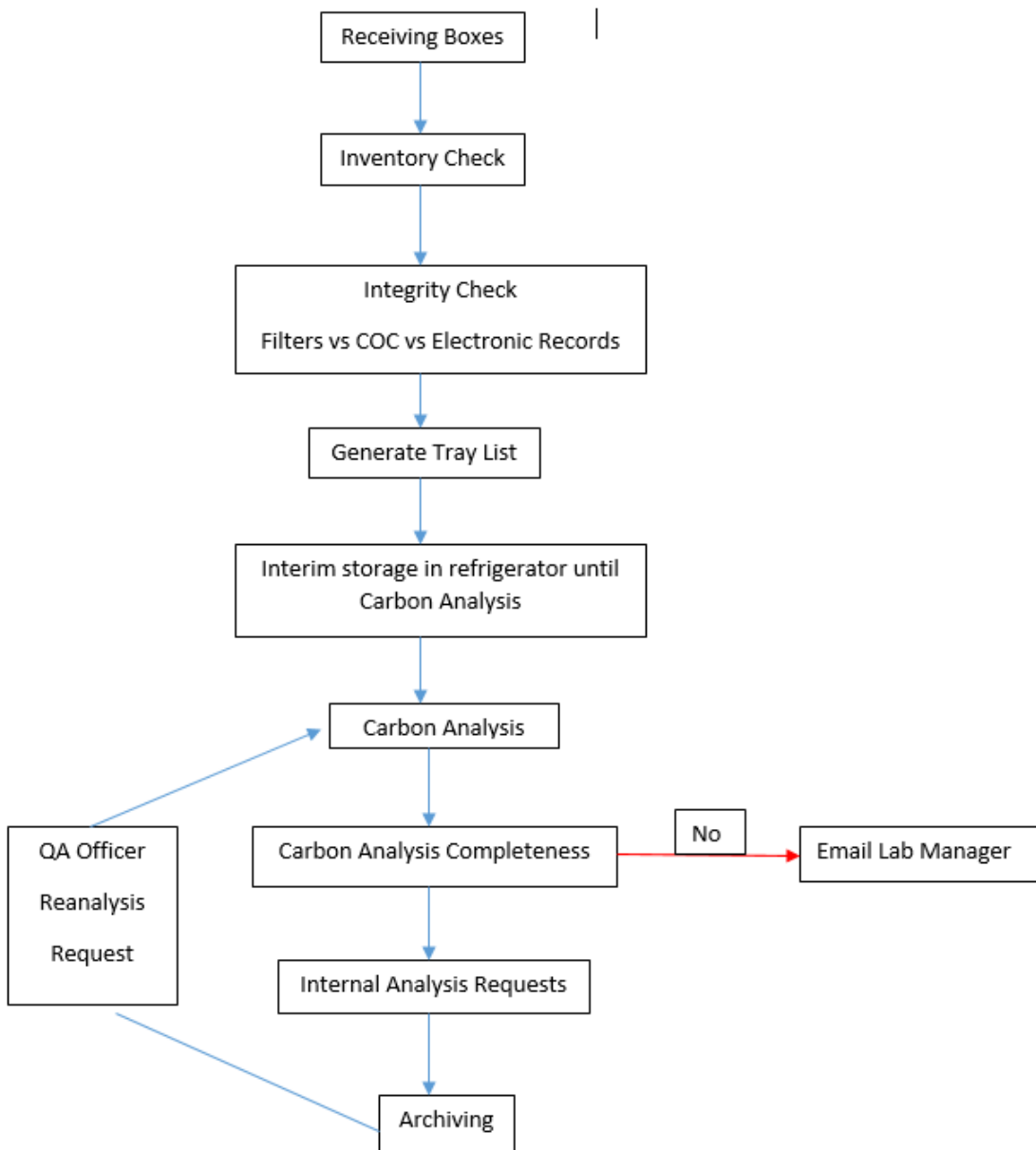
8. EQUIPMENT AND SUPPLIES

Not applicable.

9. PROCEDURAL STEPS

The flowchart of sample receiving and inventorying shown in Figure 1.

Figure 1. The flowchart of sample receiving to archiving.







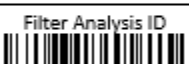

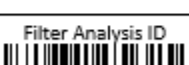
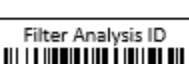
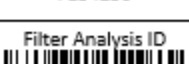
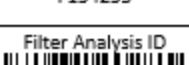
9.1. Receiving of Samples

The CSN samples are shipped in coolers from Wood to UC Davis with accompanied COC forms (Figure 2). Upon receipt, the operator will sign, and write down the date and time on the COC. The COC includes the following information for each sample, Lab Analysis ID, intended use date, analysis type, set number, and status flag.

The operator unpacks the boxes in designated location (Jungerman Hall, room 116) and inventories the filters.

Figure 2. Example of chain of custody form.

Analysis Request ID

 Intended Sample Date 4/3/2019 — Sampling date
 Set # 4a — Set number
A0000054 — Batch ID

Barcode/Filter Analysis ID	Filter Type	Analysis Requested	Invalid?
Filter Analysis ID  F153411 — Barcode ID	Quartz	Carbon	<input type="checkbox"/>
Filter Analysis ID  F153414	Quartz	<u>Carbon</u> — Analysis Request	<input type="checkbox"/>
Filter Analysis ID  F153417	Quartz	Carbon	<input type="checkbox"/>
Filter Analysis ID  F153420	Quartz	Carbon	<input type="checkbox"/>
Filter Analysis ID  F153423	Quartz	Carbon	<input type="checkbox"/>
Filter Analysis ID  F153426	Quartz	Carbon	Invalid sample — <input checked="" type="checkbox"/>
Filter Analysis ID  F153429	Quartz	Carbon	<input type="checkbox"/>
Filter Analysis ID  F154238	Quartz	Carbon	<input type="checkbox"/>
Filter Analysis ID  F154247	Quartz	Carbon	<input type="checkbox"/>
Filter Analysis ID  F154250	Quartz	Carbon	<input type="checkbox"/>
Filter Analysis ID  F154253	Quartz	Carbon	<input type="checkbox"/>
Filter Analysis ID  F154256	Quartz	Carbon	<input type="checkbox"/>

9.2. Inventorying

The purpose of inventorying is to perform an integrity check to verify the filter count is equal to the number of samples listed on the COCs and the number of electronic records. In addition, the operator verifies the BarcodeID prior to loading samples into the carbon analyzers. After completing inventory, the operator sends an email to the laboratory manager and staff research analyst (SRA). The SRA requests internal reanalysis based on QC protocols and sends an email to the QA officer with results of the integrity check, including any anomalies.

The samples are organized and shipped by Wood, where each shipment is assigned a batch number. Each batch contains multiple boxes of Petri trays. Each Petri box can hold two Petri trays, while each tray contains 50 Petri slides. The samples are organized in numerical order based on the COC. The boxes and each Petri tray are labelled with sampling date and set numbers. The samples are labelled with a unique barcode sticker, which is also the Filter Analysis ID (e.g., F000002) on the Petri slide.

Using the COC as a guide, check the 1st, 25th, 26th, and 50th sample of each Petri tray. This ensures the samples in the Petri tray are in the same order as on the COC. Prior to analysis, each filter analysis ID (e.g., F000002) will be verified with the COC.

Use a red pen to mark the COC with a small dash (-) after the 50th sample of each tray. Next to the dash, write down the tray number format T# (e.g., T1) with a red pen. In addition, write the batch number and tray number on every Petri tray format B#T# (e.g., B7T1). If less than 50 samples are received in a Petri tray or Ziploc bag, continue with the sample procedure by checking first and last filters in the tray or bag. Note the number of filters received and the number of filters records on the COC.


For samples received without COC documentation, leave the sample in the tray. Draw an asterisk (*) on the COC between the two records where the filter is located. On the bottom of the COC draw an asterisk and write the filter analysis ID, and write the comment, "Sample missing from COC, refer to appendix for further sample information." Initial and date the comment. Open UCD COC, U:\IMPROVE_Lab\XRF_Epsilon5\CSN\Forms\UCD COC.xlsx and enter the requested information in the worksheet "Enter Data". The UC Davis Laboratory Chain of Custody Form will then be generated, see Figure 3. Print the form and place behind all the COCs for the specific batch.

Figure 3. UC Davis Chain of Custody Form.


UC Davis Laboratory Chain of Custody Form
 Form to be used for samples received from Wood without a Chain of Custody Form

Received Name _____ Date/Time _____

Analysis Request ID _____



A0000036

Barcode/ Filter Analysis ID	Filter Type/ Manufacturer ID	Analysis Requested/ Intended Sample Date	Invalid? Set #
Filter Analysis ID  F080769	Teflon 220462458	XRF 10/4/2017	7Q

Report Integrity check information (Figure 4) and discrepancies to the Laboratory Manager and QA officer via email. The Filter Count is the number of samples received within a Batch. The COC refers to the number of samples included in the COC. The Electronic Records refers to the number of records in the database for the specific Batch. Note different terminology is used in the database. To view the number of electronic records, log into the CSN Data Management Site and view Batch Details. In Batch Details, add up number of Quartz filters in each set. The total Quartz count is the number of electronic records for the Batch. Record the number of records in Figure 4.

Figure 4. Integrity check table.

Filter Count	COC	Electronic Records
# of samples received	# of samples listed	# of records in the file

9.3. CSN Data Management Site

The CSN Data Management Site is an internet-based application (webapp) that provides the user interface to the electronic data associated with the CSN network for all the sample types (Quartz, Nylon, and Teflon). The electronic files are provided by Wood in a Microsoft Excel format. The electronic data is ingested into the CSN database by the UC Davis QA officer. The URL for the CSN Data Management Site (CSN webapp) is *csn.agrc.ucdavis.edu*; a valid UC Davis ID and password are required. For access to the CSN Data Management Site, check with developers and/or Crocker IT.

The CSN webapp has four main menus: Home, Analyses, Import, and Admin. The carbon lab personnel do not currently use Import or Admin. The Home Menu has seven submenus. For additional details, refer to 9.3 CSN Data Management Site in TI302B Receiving and Inventorying of CSN Samples. The Analyses-Carbon menu is used to input lab flag and comment as well as to generate tray list (Sect. 9.4).

9.4. Generate Carbon Analysis Tray List

Tray lists for carbon analysis are generated through the CSN webapp located at: <https://csn.aqrc.ucdavis.edu/CarbonSampleAnalysis/GenerateTrayList>. For each analyzer, select the designated batch number and tray number, starting with Tray 1. Once all 5 trays are selected, click “Update” and “Copy to Clipboard”. Open the excel printing template located under U:\IMPROVE_Lab\Carbon Analysis Lab\Daily Operation files\Inventory\, paste the copied tray list and print it out. For Tray 1-5, leave the **Last Replicate Filter Number** and **Last Filter Number** fields blank. Starting from Tray 6-10, input the last replicate filter number and the last filter number from the previous list (e.g., for Tray 6-10, the last replicate filter number is 240, and the last filter number is 250). Continue with the rest of the trays until all trays in a batch are assigned an analyzer.

9.5. Storage

CSN network samples are stored between 0 and 4 °C. Refrigerators are available for CSN sample storage, located in Jungerman Hall room 116. Archive samples for long-term storage after XRF analysis. Refer to *UCD CSN SOP #901: Long-Term Archiving of Filters*.

9.6. Cooler Return

The operator will prepare and ship the ice packs/coolers back to Wood, using the provided UPS return labels. If labels are not provided contact Wood for shipping account information.

9.7. Carbon Analysis Completeness

When Carbon analysis of a batch is completed, notify the Lab supervisor. The Lab supervisor will check data completeness and duplication. Any discrepancies will be resolved prior to data delivery.

To check Analysis completeness, go to the website <http://analysis.crocker.ucdavis.edu:3838/csnStatus/>. On the left-hand side of the page, select *Analysis Completeness*, then select the appropriate Year and Month. Review the list *Filters Not Yet Analyzed by TOR*. If any samples are on the list review the comments, verify samples were received. Notify the Laboratory Manager of any discrepancies.

To check data duplication, go to U:\IMPROVE_Lab\Carbon Analysis Lab\Daily Operation files\CSN QC\R and run the script “qCarbon_Monthly_QC.R” in R. The dataframe “duplicate” contains any FilterID with more than 1 valid records. Resolve the issue by keeping only one record as valid.

10. QUALITY ASSURANCE AND QUALTY CONTROL

Not Applicable.

11. REFERENCES

Not Applicable.