

UCD CSN Technical Information #302B

Receiving and Inventorying of CSN Samples

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

Version 1.0

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1. PURPOSE AND APPLICABILITY

The subject of this standard operating procedure (SOP) is receiving and inventorying of samples collected in CSN network. The scope is to ensure good laboratory practice of receiving samples by checking condition and amounts with the chain-of-custody forms, and inventorying and preparing samples for XRF analysis.

2. DEFINITIONS

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

Chain-of-custody (COC) form: The form received with the samples including the list, amount, sample type etc.

Analysis Request ID: Amec assigns a batch number to each shipment of filters, eg A0000001. Other names include, Batch ID, and ContractorBatchNumber.

Lab Analysis ID: Amec assigns a barcode to each sample format F#####, eg F000002. Other names include Barcode ID, and ContractorFilterAnalysisId.

Teflon filter ID#: Manufacturer serial number stamped on the outer membrane of a filter, eg T5656360.

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

XRF Application: The program contains the parameters for measuring a sample by XRF; specific to each instrument

XRF queue file: A list of electronic records associated with a Batch of CSN samples to be analyzed by XRF. Each record includes the following information; Barcode ID, SampleId and XRF Application, eg F000002, 325, CSNv1.1_Nanna.

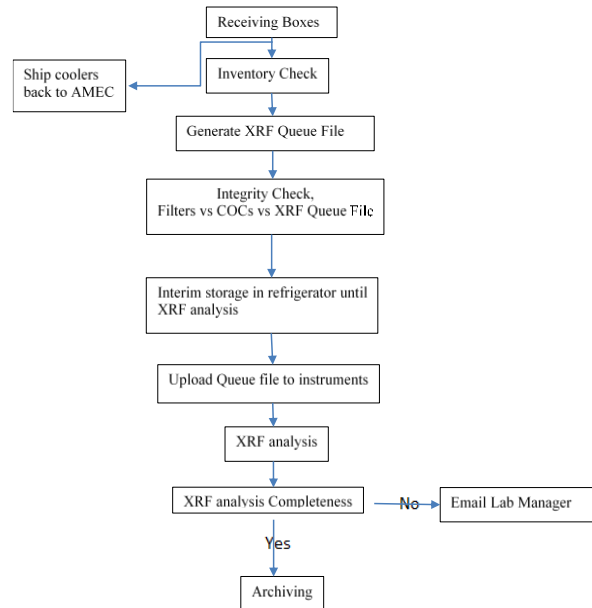
CSN Data Management Site: User interface web application for the CSN database (*csn.crocker.ucdavis.edu*).

Operator: Authorized personnel responsible for processing CSN samples; must be approved by the Lab Manager. The operator shall have access to Jungerman Hall rooms 116 and 120A where the XRF instruments and refrigerators are located.

3. PROCEDURES

The flowchart of sample receiving and inventorying shown in Figure1.

Figure 1. The flowchart of sample receiving to archiving.



3.1 Receiving of Samples

The CSN samples are shipped in coolers from Amec to UC Davis accompanied Chain-of-Custody (COC) forms (Figure 2). Upon receipt, the operator sign and date the COC. The COC includes the following information for each sample, Lab Analysis ID, intended use date, analysis type, Teflon filter ID#, set #, and status flag.

The operator unpacks the boxes in designated location (Jungerman Hall, room 120A) and inventories the filters.

Figure 2. Example of chain of custody form.

Batch ID	Analysis Request ID	Intended Sample Date	Set #	Sampling date
	F0000001	2/15/2016	1	
Barcode ID	Filter Analysis ID	Filter Type	Analysis Requested	Invalid?
	F000001	Teflon	XRF	
	F000002	Teflon	XRF	
	F000003	Teflon	XRF	
	F000004	Teflon	XRF	
	F000005	Teflon	XRF	
	F000006	Teflon	XRF	
	F000007	Teflon	XRF	
	F000008	Teflon	XRF	
	F000009	Teflon	XRF	
	F000010	Teflon	XRF	
	F000011	Teflon	XRF	
	F000012	Teflon	XRF	
	F000013	Teflon	XRF	
	F000014	Teflon	XRF	
	F000015	Teflon	XRF	
	F000016	Teflon	XRF	
	F000017	Teflon	XRF	
	F000018	Teflon	XRF	
	F000019	Teflon	XRF	
	F000020	Teflon	XRF	
	F000021	Teflon	XRF	
	F000022	Teflon	XRF	
	F000023	Teflon	XRF	
	F000024	Teflon	XRF	
	F000025	Teflon	XRF	
	F000026	Teflon	XRF	
	F000027	Teflon	XRF	
	F000028	Teflon	XRF	
	F000029	Teflon	XRF	
	F000030	Teflon	XRF	
	F000031	Teflon	XRF	
	F000032	Teflon	XRF	
	F000033	Teflon	XRF	
	F000034	Teflon	XRF	

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3.2 Inventorying

The purpose of inventorying is to perform an integrity check to verify the number of samples on the COC and the queue file. A detailed inventory is done when loading samples to XRF instruments. The samples are organized and shipped by Amec, and shipments from Amec are 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. Amec labels the boxes and each Petri Tray with the set numbers. The samples are identified by the Lab Analysis ID (eg F000002) on the bottom of the Petri slide.

Using the COC as a guide, check the 1st, 25th, 26th and 50th sample of each Petri tray. 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# (eg T1) with a red pen. In addition, write the batch number and tray number on every Petri tray format B#T# (eg 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.

Integrity check information (Figure 3) and any discrepancies are reported to the Lab Manager via email. For instructions on performing queue file check, refer to Section 3.4, XRF Queue Generation.


Figure 3: Integrity check table.

Filter Count	COC	XRF Queue file
# of samples received	# of samples listed	# of records in the file


To receive boxes, go to the CSN Data Management site (Figure 4), and update the following information for the batch; BoxReceivedDate, BoxSampleCount, BoxFirstSampleDate and BoxLastSampleDate. Refer to Section 3.3, CSN Data Management Site for instructions.


Figure 4: CSN Data Management Site.


Receive Box for Batch A000007

BoxReceivedDate: 

BoxReceivedBy:

BoxSampleCount: 

BoxFirstSampleDate: 

BoxLastSampleDate: 

Comments:

3.3 CSN Data Management Site

CSN Data Management Site is the user interphase to the electronic data associated with the CSN network for all the sample types (Quartz, Nylon, and Teflon). The electronic files are provided by Amec in a Microsoft Excel format. The electronic data is ingested into the CSN database by the UC Davis developers. The URL for the CSN Data Management Site (CSN webapp) is *csn.crocker.ucdavis.edu*; a valid UC Davis ID and password are required. For access to the CSN webapp check with developers and/or Crocker IT.

The CSN webapp has four main menus, Home, Analysis Data, Import and Admin. The lab group does not currently use Analysis Data, Import or Admin. The Home Menu has seven submenus:

1. The *Filters* submenu (Figure 5) is helpful when looking to select specific records for a given batch.

Figure 5: Filter results.

The screenshot shows a 'Filter Results' dialog box with the following fields and values:

- Filter Type: Teflon
- Batch: All
- Site: All
- IntendedUseDate: Start: 03/09/2016, End: (empty)
- Filter Purpose: All
- Invalid: Not Set
- Null Code: All
- Qualifier Code: All
- Comments: (empty text box)
- SampleEventId: (empty text box)
- Set: (empty text box)
- ManufacturerNumber: (empty text box)
- Lot: (empty text box)
- Max Results: 100

Buttons at the bottom: Filter, Close.

2. The *Filter Details* submenu (Figure 6) is helpful when looking for detailed information for a given filter. Qualifier codes and comments are added in this view. It is possible to search records by Filter Barcode or Filter ID.

Figure 6: Filter details.

Filter Barcode/Id:

Filter Details

Id	6959
ContractorFilterAnalysisId	F007456
ContractorBatchNumber	A0000006
Sampler	30-049-0004: Seiben Flats, MT (id: 133)
IntendedUseDate	1/31/2016 12:00:00 AM
SampleStartDate	1/31/2016 12:00:00 AM
SampleEndDate	2/1/2016 12:00:00 AM
FilterPurpose	SA - Sample (id: 1)
AqsNullCodeId	<input type="button" value="Edit Aqs Null Code"/>
Invalid	False
QualifierCodes	<input type="button" value="Edit Qualifier Codes"/>
FilterType	Teflon
ChannelPosition	5
SampleVolume	9.67 m ³
AvgFlow	6.72 LPM
AvgFlowCv	0.01
AvgAmb Temp	-3.50 °C
AvgBp	658.00 mm Hg
AnalysisType	XRF
ContractorSampleEventId	Q0672016013101
ContractorSetNumber	6q
ManufacturerNumber	T6645775
LotNumber	MTLCY2015
Comments	<input type="button" value="Edit Comments"/>

- The *Batches* submenu (Figure 7) includes a list of all shipments received and the corresponding electronic records. Batch Details will give the details of the Batch including Receiving Box, and Generate XRF Queue.

Figure 7: Batch list.

Batches						
ContractorBatchNumber	BoxReceivedDate	BoxSampleCount	BoxFirstSampleDate	BoxLastSampleDate	BoxReceivedBy	Comments
<input type="checkbox"/> A0000001	12/16/2015 8:38:43 PM	346	11/20/2015 12:00:00 AM	12/21/2015 12:00:00 AM	marigaby	Initial import of data received
<input type="checkbox"/> A0000002	1/28/2016 9:51:00 AM	2409	11/20/2015 12:00:00 AM	12/14/2015 12:00:00 AM	marigaby	

- The *Lab Blanks* submenu (Figure 8) view and generate the electronic records for the laboratory blanks.

Figure 8: Lab Blanks.

Lab Blanks <input type="button" value="Add Lab Blank"/>													
Batch	Sampler	FilterPurpose	AqsNullCode	FilterType	Invalid	IntendedUseDate	SampleVolume	AnalysisType	ContractorFilterAnalysisId	ContractorSampleEventId	ContractorSetNumber	ManufacturerNumber	LotNumber
<input type="checkbox"/>		LB		Teflon	False			XRF	T6571484			T6571484	MTLCY2015

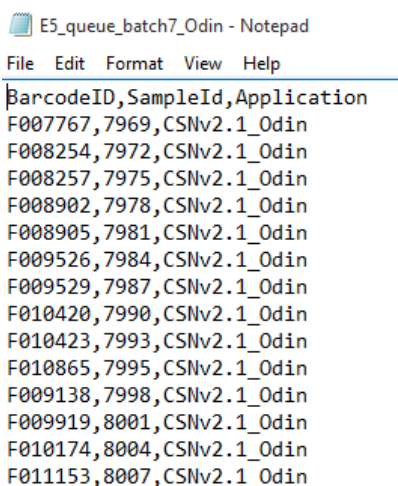
3.4 XRF Queue Generation

XRF queue files are generated with BarcodeId, SampleId, and Application information. The sample changer software uses the data within the queue file to link the Lab Analysis Barcode with the Sample identity and the application.

To generate the XRF queue file, access the CSN Data Management Site and select *Batches* from the top menu. Scroll to select *View Record Details* next to the batch number, and select *Generate XRF Queue*. Choose the application associated with the XRF instrument. If lab blanks are received with the current batch, leave selected, otherwise exclude the lab blanks. All samples are analyzed regardless of flag status, including the invalid samples, click *Go*.

Save the queue file to *U:\IMPROVE_Lab\XRF_Epsilon5\CSN\Queue files*. Change the file name to *E5_queue_batch#_instrument name* (Figure 4). Open the file and check the number of samples in the file. If samples are missing the Barcode ID then go to CSN webapp and review comments. Record the number of samples, and send an email with the integrity check information (Figure 3) to the Lab Manager.

Figure 4: XRF queue file.



The screenshot shows a Notepad window titled "E5_queue_batch7_Odin - Notepad". The window contains a list of sample data in a tabular format with columns for BarcodeID, SampleId, and Application. The data is as follows:

BarcodeID	SampleId	Application
F007767	7969	CSNv2.1_Odin
F008254	7972	CSNv2.1_Odin
F008257	7975	CSNv2.1_Odin
F008902	7978	CSNv2.1_Odin
F008905	7981	CSNv2.1_Odin
F009526	7984	CSNv2.1_Odin
F009529	7987	CSNv2.1_Odin
F010420	7990	CSNv2.1_Odin
F010423	7993	CSNv2.1_Odin
F010865	7995	CSNv2.1_Odin
F009138	7998	CSNv2.1_Odin
F009919	8001	CSNv2.1_Odin
F010174	8004	CSNv2.1_Odin
F011153	8007	CSNv2.1_Odin

Upload the queue file to the instrument in the following folder directory *C:\PANalytical\Epsilon5\Programs\Changer\Barcode Scripts* and save the file as *E5_queue*. Replace the current file in the folder. Follow the same procedure to generate the queue for another instrument.

PANalytical software will only recognize the queue file in txt format. The operator can generate the script file directly from the instruments computer. Use caution when saving the file to the instrument.

4.3 XRF Inventory

Samples are inventoried at the XRF upon loading by scanning directly into the sample changer software for the Epsilon 5 instruments. The operator will verify individual sample receipt by comparing Lab Analysis Barcode ID with the COC. Record the instrument name, tray and position number for the first and last samples in the XRF tray (Figure 5).

Figure 5: COC with XRF assigned Instrument Name, Tray and Position number.

CSN Laboratory Chain of Custody Form

Ship Date and Name: 4/26/2016 BARNARD
 Receive Date and Name: 04/27/2016 M6 NAWA 0957

Analysis Request ID: A0000007
 Intended Sample Date: 2/3/2016
 Set #: 3

Batch number: A0000007

Barcode/Filter Analysis ID	Filter Type	Analysis Requested	Invalid?
F007687	Teflon T6646344	XRF	Nanna (E) T-1 Tray Number First sample: Instrument name, Tray, Position
F007690	Teflon T6646345	XRF	
F007693	Teflon T6645988	XRF	
F007696	Teflon T6646346	XRF	
F007699	Teflon T6646347	XRF	
F007702	Teflon T6646230	XRF	
F007705	Teflon T6646238	XRF	
F007708	Teflon T6646348	XRF	Nanna (E) Last sample: Instrument name, Tray, Position
F007711	Teflon T6645989	XRF	Nanna (E)
F007714	Teflon T6646231	XRF	
F007717	Teflon T6646349	XRF	

Teflon Filter ID

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3.5 Laboratory Blanks

Amec will provide a box of 50 filters every time the Teflon lot changes. The Lab Manager will inform the operator when to prepare the lab blanks for analysis.

Lab blanks have a manufacture code which is also used as the Teflon filter ID, format T5656360. Generate a barcode sticker for each filter using the Teflon filter ID. Prepare 32 laboratory blanks to be analyzed by XRF. Refer to *UCD CSN TI #302C: Sample Changes for 8-Position Trays* for further details.

3.6 Storage

CSN network samples are stored between 0 and 4 °C. Two refrigerators are available for CSN sample storage, located in Jungerman Hall rooms 120A and 116. Store samples ready for XRF analysis in 116 while samples ready for Transmissometer analysis are stored in 120A. After analysis is completed, the samples are archived refer to *UCD CSN SOP #901: Archiving* for achieve instructions.

3.7 Cooler Return

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

3.5 XRF Analysis Completeness

When XRF analysis of a batch is completed, notify the Lab Manager. The Lab Manager will check completeness of the data comparing the XRF results files to the inventory list for each batch; the filter status of each sample is cleared of duplicates (only one valid result per sample). Any discrepancies will be resolved before the data is delivered.

To check Analysis completeness go to the website <http://169.237.146.119:3838/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 XRF*. If any samples are on the list review the comments, verify samples were received. Notify the Laboratory Manager of any discrepancies.