

Roy Cooper
Governor
Elizabeth Biser
Secretary
Michael A. Abraczinskas
Director



DAQ-03-001.2 Standard Operating Procedure (SOP)
Xonteck 911 Urban Air Toxics (UAT) Volatile Organic Compound (VOC)
Sampler
for the North Carolina Division of Air Quality (NCDAQ)
Operator Responsibilities
Revision: 0
Effective Date: 8/08/2022



1.0 APPROVAL SIGN OFF SHEET

I certify that I have read and approve of the contents of the Standard Operating Procedure for the Xonteck 911 UAT VOC Sampler Operator Responsibilities written here with an effective date of August 8, 2022.

Director, Air Quality Division

Mike Abraczinskas

DocuSigned by:

Michael Abraczinskas

Signature: _____

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Date: 8/3/2022

Ambient Monitoring Section Chief

Patrick Butler

DocuSigned by:

Patrick Butler

Signature: _____

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Date: 8/3/2022

Laboratory Analysis Branch Supervisor

Jim Bowyer, Environmental Program Supervisor

DocuSigned by:

Jim Bowyer

Signature: _____

C06004026C0B41D...

Date: 8/3/2022

Projects and Procedures Branch Supervisor

Joette Steger, Environmental Program Supervisor

DocuSigned by:

Joette Steger

Signature: _____

B278F8106CEC4DC...

Date: 8/3/2022

Primary SOP Author

Steven Walters, Chemist II

DocuSigned by:

Steven Walters

Signature: _____

AE6DEE7D0265442...

Date: 8/3/2022

Disclaimer:

This document, and any revision hereto, is intended solely as a reference guide to assist the user in the operation of VOC canister sampling equipment, related to the North Carolina Division of Air Quality's Ambient Monitoring Program.

GLOSSARY OF ACRONYMS

COC – Chain of Custody

FAS/SN – Fixed Asset System/Serial Number

L – Liter

mL/min – milliliter per minute

NIST – National Institute of Standards and Technology

psi – pounds per square inch

psig – pounds per square inch gauge

SN – serial number

VOC – volatile organic compound

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2.0 SCOPE AND PURPOSE

The scope and purpose of this procedure is to ensure the successful operation of the Xonteck 911 sampler. This sampler is used for collecting volatile organic compounds (VOCs) from the ambient air into specially designed 6-L(liter) canisters. This document covers sampler operator responsibilities which includes sample media inspection, site shelter inspection, pre-sample verifications, post-sample verifications, data review, and shipment of sample media back to the analysis laboratory. This document also covers the procedures for documenting site activities using the site logbook and recording of sample collection data onto chain of custody (COC) forms.

3.0 EQUIPMENT CHECKS

The following equipment checks are performed by the site operator prior to each site visit. These checks include sample media inspection and flow meter checks.

3.1 List of Materials

The following list of materials are needed when performing the procedures in this document.

- Xonteck 911 sampler that is certified clean and installed at the site
- Specially designed, 6-L canister(s)
- National Institute of Standards and Technology (NIST) traceable time keeping device
- NIST traceable flow meter
- Extra AA batteries for the flow meter
- Canister COC forms assigned to the canister samples being installed and collected
- Canister shipping box
- Extra COC seals
- Site logbook
- Black or blue indelible ink pens
- Paper clip

3.2 Sample Media Inspection

Sampling media is shipped from the analysis laboratory to the field site operator. The site operator must inspect each shipment. The following must be present with each shipment:

- VOC Canister COC form. One form for each canister in the shipment.
 - Silica-lined, 6L sample canisters. Typically, two canisters are shipped at one time.
 - Each canister valve must be sealed with a COC tag.
 - Return shipping label.
1. Open the canister shipping box and verify the canisters are undamaged and that a COC form is present for each canister present in the shipment.
 2. Verify a return shipping label was included in the shipping box.

3. If a damaged canister is discovered, contact the laboratory for guidance on whether the damaged canister can be used for sampling or to schedule a new shipment of replacement canisters. If damaged canisters are used for sampling, place comment on the COC form.
4. If a COC form is missing, contact the laboratory for guidance on whether the canister with the missing COC form can be used for sampling or to schedule a new shipment of replacement canisters.
5. Compare the canister number and cleaning batch# recorded on the COC form against the canister number stamped on the canister and against the canister number and cleaning batch number recorded on the canister tag.
6. If any of the information does not match, contact the laboratory for guidance on correcting the mismatched information or to schedule a new shipment of replacement canisters.
7. Verify the canister valve cover is sealed with an in-tact COC tag and verify the COC tag number matches the number recorded in the **“Canister COC #”** field in the **Pre-Sample (Lab)** section on the COC form.
8. If the canister valve COC seal is in-tact and undamaged, check the box next to **“Canister COC seal intact”** field on the COC form.
9. If the canister valve COC seal is broken or damaged, leave the check box blank. Contact the laboratory for guidance on whether the canister can be used for sampling or to schedule a new shipment of replacement canisters. If the canister is used for sampling, place a comment on the COC form such as “canister valve COC seal damaged” or something similar.
10. If the canister valve COC seal number matches the number recorded on the COC form in the **“Canister COC #”** field in the **Pre-Sample (Lab)** section, check the box next to the **“Same # as sealed”** field on the COC form.
11. If the canister valve COC seal number does not match the COC form, leave the check box blank. Contact the laboratory for a replacement canister and/or guidance on whether the canister can be used for sampling. If the canister is used for sampling, place a comment on the COC form indicating the canister valve COC seal number does not match the number recorded on the COC form.

3.3 Flow Meter Inspection

The Agilent ADM flow meter used to verify and adjust Xonteck sampler flows is battery powered and contains a disposable flow cartridge. The flow meter should be checked for general functionality, battery life, and flow meter cartridge expiration date.

1. Turn on the flow meter, check the battery life indicator on the main display screen of the flow meter. Replace the batteries if needed.
2. With the flow meter on, listen for a repeatable, audible clicking sound that occurs in 1-second or less intervals. This sound and quick, repetitive nature of the audible click indicates the flow meter is functioning properly at least initially.
3. If the flow meter is silent when turned on, the batteries may be too low, or the flow meter cartridge may be damaged.
4. If battery replacement or flow meter cartridge replacement does not correct the issue, contact the laboratory for guidance on replacing a bad flow meter.
5. Verify the flow meter cartridge has not expired. Scroll through the flow meter menu options to find the flow meter cartridge expiration date.

6. If the flow meter cartridge is expired, contact the laboratory to schedule shipment of the flow meter to the laboratory for flow meter cartridge replacement. The expired flow meter may be used to measure and adjust sampler flows but a comment must be placed on the canister COC form indicating an expired flow meter was used.

4.0 SITE CHECKS

This section describes site checks that should be performed during each site visit.

4.1 Site Shelter Checks

From ground level, visually inspect the outer perimeter of the site shelter for the following:

- Excess vegetation growth.
- Damage to exterior walls including water, mold, or mildew damage.
- Insect activity such as fire ant mounds, spider webs, and beehives.
- Nearby, ongoing construction activity such as road work, building renovations or new housing developments or building projects.
- Nearby controlled burning activities or active open burning within visual range of the sampling site.

Do not remove excess vegetation or apply insecticide on the day before or day of a scheduled sampling event. Remember to log all site activities including vegetation removal and insecticide applications in the site logbook including the date the activity was performed. Also, remember to log all observation of nearby construction activity or nearby open burning in the site logbook.

Contact the laboratory immediately, if damage to the site shelter is observed.

4.2 Sampler Inlet Line Check

4.2.1 Sampler Inlet Line Check (Outside Site Shelter)

While outside the site shelter and at ground level, visually inspect the section of the sampler inlet line called the “candy cane” to ensure the candy cane is attached securely to the site shelter and is in the vertical position. Use zip ties to affix the candy cane in an upright, vertical position. Only climb onto the site shelter roof to repair the sampler inlet line when another staff member is also present at the site to act as a spotter. Do not climb on the site shelter roof if visiting the site alone, reschedule the repair when additional staff are available to be a spotter. If samples are collected when the sampler inlet line is not vertical, place a comment on the canister COC form indicating the sampler inlet line outside the site shelter is not correctly positioned.

4.2.2 Sampler Inlet Line Check (Inside Site Shelter)

After completing the outside portion of the sampler inlet line check, inspect the sampler inlet line that is inside the site shelter. Make sure the pipe insulation surrounding the inlet line is securely attached. The insulation must run from the point where the inlet line enters the site shelter all the way to where the inlet line attaches to the sampler. Contact the laboratory for additional pipe insulation or procure pipe

insulation and secure the pipe insulation using zip ties or tape as needed. If samples are collected when portions of the sampler inlet line inside the site shelter are not insulated, place a comment on the COC form indicating the sampler inlet line is not insulated properly.

5.0 DETAILED PROCEDURES

5.1 Canister Sample Setup

1. Upon arrival at the site, look for the sampler expiration date and Fixed Asset System/Serial Number (FAS/SN) number (typically located on the sampler's certification sticker). Record the FAS/SN in the "Sampler ID#: ____" field and check the expiration date and record this verification by checking the box next to the "Exp. Date Checked" field on the COC form.
2. If the sampler is out of certification, check the box next to the "Exp. Date Checked" field on the COC form. Contact the laboratory to schedule replacement of the expired sampler. The expired sampler may be used if a replacement sampler cannot be installed prior to the scheduled sampled date, however the detected VOCs in the sample must be qualified prior to reporting the data. Place a comment such as "sampler expired" on the COC form.
3. Record the ADM flow meter serial number (SN) in the "Flow Meter ID# ____" field on the COC form and verify the flow meter expiration date and check the box next to "Exp. Date Checked" on the COC form.
4. If the flow meter is out of certification, check the box next to "Exp. Date Checked" field on the COC form. Contact the laboratory to schedule replacement of the expired flow meter cartridge. The expired flow meter may be used if a replacement flow meter cartridge cannot be installed prior to the scheduled sample date, however the detected VOCs in the sample must be qualified prior to reporting the data. Place a comment such as "flow meter expired" on the COC form.
5. Perform the Pre-Sampling Avg. Flow Check by attaching the ADM flow meter using the quick-connect fitting on the VOC sampler fill line.
6. Quickly press the flow meter **power/mode** button until **Vol (mL/min)** is displayed in the upper left corner of the ADM flow meter screen.
7. Press the sampler timer **manual** button to start the sampler pump.
8. Press the flow meter **select** button to store up to four flow readings and display the current flow reading. The current flow reading may fluctuate 1-2 mL/min (milliliters per minute), which is normal when measuring very low flow rates).
9. After storing four flow readings, pressing the select button again will clear all stored flow readings.
10. When all four flow rate fields are empty, begin taking flow rate readings by pressing the flow meter **select** button to capture a flow rate reading. Collect four consecutive flow rate readings approximately 10 seconds apart.
11. Record the four flow rate readings in the "**#1;#2;#3;#4:**" fields located to the right of the "**Pre-Sampling Avg Flow Check: ____ mL/min**" field on the COC form. See figure 1 showing where to record flow meter readings and the average flow rate reading. Calculate the average flow rate and record this value on the line next to the "**mL/min**" field.

Figure 1: Pre-Sample Avg Flow Check Fields on COC Form

Pre-Sampling Avg Flow Check: _____ mL/min	#1:	#2:	#3:	#4:
Acceptable Range: 8 mL/min to 12 mL/min (max)				

12. If the pre-sampling avg. flow check is outside the acceptable range, adjust the sampler flow using the variable flow controller until the flow meter displays an acceptable flow rate on the flow meter.
13. Take four more readings and calculate an average flow rate and record these values in the comments field on the COC form. Repeat until acceptable average flow rate is achieved.
14. Turn off the sampler pump.
15. Remove the flow meter from the sampler.
16. Locate the sampler timer clock and verify the displayed time is within ± 5 minutes of the current NIST time for the eastern time zone not adjusted for daylight savings.
17. The current NIST time can be found by visiting this website using a computer, cell phone, or smart watch: <https://www.time.gov/>
18. When performing sampler timer clock checks and adjustments during daylight savings time (late spring to early fall), **please be aware that the "Eastern Daylight Time" displayed on time.gov must be adjusted to standard time by subtracting 1-hour from the displayed NIST time before comparing the NIST time against the sampler time and before making any adjustments to the sampler time.**
19. If the sampler timer and NIST time (adjusted to standard time) are within ± 5 minutes of each other, no adjustment is needed. Check the box next to "**Timer Clock checked against NIST**" field on the COC form and do not check the box next to "**Timer Adjusted (Details noted in comments below)**" field on the COC form.
20. If the sampler timer is outside the time criteria, check the box next to "**Timer Clock checked against NIST**" field and check the box next to "**Timer Adjusted (Detailed noted in comments below)**" field. Record details of the time adjustments made in the comments section on the COC form.
21. To set the current time, press and hold "clock" button. Keep holding clock button until current day, hour, and minute are setup in the timer.
22. Press the "D+" button to select the current day of week as displayed on the timer display.
23. Press the "H+" and "M+" buttons to select the current hour and minute.
24. Release "clock" button and current time displays on the timer display. Record details of the time adjustments made in the comments section on the COC form.
25. Break the canister COC seal and record the initials, date, and time the canister COC seal was broken in the "**Canister COC Broken by Initials, Date, & Time**" field on the COC form.
26. Attach the canister to the end of the sampler fill line using the quick-connect fittings.
27. Perform a leak check by opening and immediately closing the canister valve to put a slight vacuum on the sampler pressure gauge. Another acceptable leak check method is to keep the canister valve closed, turn on the sampler pump and allow the sampler pressure gauge to read approximately 10-20 pounds per square inch (psi); turn off the sampler.
28. Record the starting leak check pressure in the "**Start**" field on the COC form. Wait approximately 10 minutes and record the ending pressure reading in the "**End**" field on the COC form. Calculate the difference and record this value in the "**Diff.**" field on the COC form and indicate a pass/fail status of the leak check. See section 9.1 in this document for routine troubleshooting of failing leak checks.
29. The scheduled sample date can be derived from the "**Sample #**" recorded on the COC form. Example: if the Sample # is 060220M, the scheduled sample date is 06/02/2020.
30. The sampler timer does not display a calendar date, only a day of the week and time. The day of the week will have to be derived from the scheduled sample date and a calendar. For example, the 06/02/2020 sample date falls on a Tuesday. This sample should start at midnight (00:00) on

(Tuesday) 06/02/2020 and end at 23:59 on (Tuesday) 06/02/2020. Sample duration must be 24 hours \pm 1-hour.

31. To program the sampler timer, press the "(P)" button until "1" and "ON" are displayed on the timer. Release "(P)" button. This allows user to set Program 1 "ON" day and time.
32. Press the "D+" button to select the day(s) of week for Program 1 to turn "ON".
33. Press the "H+" and "M+" buttons to select hour and minute for Program 1 to turn "ON".
34. Press the "(P)" button until "1" and "OFF" are displayed on the timer. Release "(P)" button. This allows users to set Program 1 "OFF" day and time.
35. Press the "D+" button to select day(s) of week for Program 1 to turn "OFF".
36. Press the "H+" and "M+" buttons to select hour and minute for Program 1 to turn "OFF".
37. Record the sampling date and sampling day of the week in the "**Sampling Date & Day**" field on the COC form.
38. Record the programmed sampler start time in the "**Timer Start Time**" field on the COC form
39. Record the programmed sampler end time in the "**Timer End Time**" field on the COC form.
40. Open the canister valve. Record the sampler pressure gauge reading in the "**Canister Vacuum Inches Hg (Field)**" field on the COC form.
41. Close the sampler door and place a COC seal through the sampler door latch so that if the sampler door is opened, the COC seal must be broken to gain access to the sampler. If extra COC seals are not available, contact the analysis laboratory for shipment of extra COC seals and place a comment on the canister COC form. Other acceptable methods for securing the sampler are described in steps 44 and 45.
42. Record the COC seal # in the "**Sampler COC #**" field on the COC form.
43. Record your initials, date and time the sampler door was COC sealed in half of the "**Canister and Sampler COCs Sealed by Initials, Date, & Time**" field on the COC form. See red filled areas in figure 2 below showing where to record the sampler COC seal # and your initials, date, and time the door was sealed.

Figure 2: Sampler COC Seal Fields on the COC Form

Sampler COC #	Canister and Sampler COCs Sealed by Initials, Date, & Time	
Canister COC #		

44. Another acceptable method for sealing the sampler door is using a keyed pad lock or combination lock that will fit into the sampler door latch. If a lock is used to seal the sampler door, enter "lock" into the "**Sampler COC #**" field on the COC form and record your initials, date and time the sampler door was locked in half of the "**Canister and Sampler COCs Sealed by Initials, Date, & Time**" field on the COC form. See red filled areas in figure 2.
45. If the sampler is located inside a locked, limited access site shelter that prevents unauthorized access, the sampler door may be left unlocked and un-sealed. Just before you leave the site and lock the shelter door, record "secure site" into the "**Sampler COC #**" field on the COC form and record your initials, date and time the site shelter is locked in half of the "**Canister and Sampler COCs Sealed by Initials, Date, & Time**" field on the COC form. See red filled areas in figure.
46. Keep the COC form at the site with the canister until the canister is retrieved after sampling.

47. Update the site logbook with the following sample setup information:

- canister number
- sample number
- scheduled sample date
- pre sampling flow check averages
- leak check status
- starting canister vacuum
- summary of site activities and observations

48. Initial and date the site logbook entry.

5.2 Canister Sample Collection

Sampled canisters should be removed from the sampler the day after the sample event ends and must be removed from the sampler before the next scheduled sample event. Sampled and unsampled VOC canisters are not temperature sensitive and do not require special temperature controls during sample storage so sampled and unsampled canisters can be transported and stored at ambient temperature.

Unsampled canisters must be used to collect a sample within 30 days of being cleaned and sampled canisters must be analyzed within 30 days of the sample date. Please be aware of these holding time requirements and make sure to pick up sampled canisters and ship sampled canisters to the laboratory as soon as possible to maximize the time available to the analyst to get the sampled canister analyzed.

1. If the sampler is housed in a secure site shelter, inspect the site shelter for unauthorized access. If the site shelter was locked with no evidence of unauthorized access, check the box next to **"Sampler COC seal intact"** and check the box next to **"same # as sealed"** fields on the COC form. If there is evidence of unauthorized access to the site shelter, leave the boxes unchecked and place a comment on the COC form such as "unauthorized access to sampler" or something similar.
2. If the sampler door is locked with a pad lock, inspect the pad lock for evidence of unauthorized access.
3. If the sampler door is locked with no evidence of unauthorized access to the sampler, check the box next to **"Sampler COC seal intact"** and check the box next to **"same # as sealed"** fields on the COC form. If there is evidence of unauthorized access to the sampler, leave the boxes unchecked and add a comment on the COC form such as "unauthorized access to sampler" or something similar.
4. If the sampler door is sealed with a COC seal, inspect the sampler door COC seal to be sure it's intact and verify the COC seal # matches the number recorded in the **"Sampler COC #"** field on the COC form.
5. If the sampler door COC seal is in-tact and the COC seal number recorded on the COC form matches, check the box next to **"Sampler COC seal intact"** and check the box next to **"same # as sealed"** fields on the COC form.
6. If the sampler door COC seal is broken or does not match the number recorded on the COC form, leave the boxes unchecked and add a comment on the COC form such as "unauthorized sampler access" or something similar.
7. Break the sampler door COC seal or unlock the pad lock or open the sampler door latch. Record the initials, date, and time in the **"Sampler COC Seal Broken by Initials, date & time"** field on the COC form.

8. Open the sampler door and record the sampler pressure gauge reading in the “**Canister Pressure (psig)**” field on the COC form. See section 9.5 of this document for guidance on failed sample collections.
9. Close the sample canister valve. Remove the sampled canister from the sampler fill line quick-connect fitting. Place a red cap over the sampled canister quick connect fitting.
10. Place a valve cover on the sampled canister valve and add a new COC seal to the valve cover.
11. Enter the canister COC seal # in the “**Canister COC #**” field in the “**Sample Setup and Collection (Field)**” section on the COC form.
12. Record the initials, date, and time the sampled canister was COC sealed in the other half of the “**Canister and Sampler COCs Sealed by Initials, Date, & Time**” field on the COC form. See area not shaded red in Figure 2.
13. Perform a post sampling flow check by attaching the ADM flow meter using the quick-connect fitting.
14. Turn on the ADM flow meter and make sure the volumetric flow setting **Vol (mL/min)** is shown in the upper left corner of the flow meter screen.
15. Press the **manual** button on the sampler timer to turn on the sampler.
16. Press the **select** button enough times to clear the stored flow rate readings and begin taking additional flow rate readings for the post sampling avg. flow check.
17. Record the flow readings in the “**#1;#2;#3;#4:**” fields located next to the “**Post-Sampling Avg Flow Check:**” field on the COC form.
18. Calculate an average flow reading and record this value in the “**mL/min**” field on the COC form immediately to the right of the “**Post-Sampling Avg Flow Check:**” field on the COC form.
19. If the post-sampling avg. flow check is outside the acceptable range, adjust the sampler flow using the flow control knob until the flow meter displays an acceptable flow rate on the flow meter.
20. Take four additional flow meter readings approximately 10 seconds apart and record these values in the “**#1;#2;#3;#4:**” fields located to the right of the “**Adjusted Sampling Avg Flow Check:**” field on the COC form.
21. Calculate the average flow rate and record this value in the “**mL/min**” field on the COC form immediately to the right of the “**Adjusted Sampling Avg Flow Check:**” field on the COC form.
22. Update the site logbook with the following sample collection information:
 - canister number
 - sample number
 - sample date
 - sampled canister pressure
 - post sampling flow checks
 - adjusted flow checks (if performed)
 - summary of site activities and observations.
23. Make sure to initial and date your site logbook entry.
24. Please note: *If setting up the next canister sample on the same day, the post sampling average flow check and recorded flow meter readings may be entered in the next sample canisters’ COC form in the “**Pre-Sampling Avg Flow Check:**” field and “**#1;#2;#3;#4:**” field. If sampler flow was adjusted during post sampling activities, record the adjusted sampling average flow and the four recorded adjusted flow meter readings in the next sample canisters’ COC form in the “**Pre-Sampling Avg Flow Check**” field and “**#1;#2;#3;#4:**” field.*

6.0 DATA REVIEW

Data review consists of performing a self-review (Level 1) on all entries recorded on the canister COC form and entries made in the site logbook. The peer-review (Level 2) of the canister COC form is performed by the laboratory analyst and Level 2 reviewer of the analysis data.

The site logbook is not routinely peer-reviewed like the canister COC form or analysis data. Site logbook entries are peer-reviewed during instrument performance audits or whenever there is a question about the canister sample collection. The site logbook may be used to trace sample collection activities and to obtain field sampling data in-case the canister COC form is mis-labeled, lost, or damaged.

6.1 Site Logbook Entry Review

Prior to leaving the field site, review the site logbook entry.

Site logbook entries made during site maintenance activities must include the following:

- current date and the initials of the person performing the site maintenance.
- detailed summary of the maintenance activities performed.
- summary of observations as needed.

Site logbook entries made during canister sample setup activities include:

- canister number
- sample number
- scheduled sample date
- pre sampling flow check averages
- leak check status
- starting canister vacuum
- summary of site activities and observations

Site logbook entries made during canister sample collection activities include:

- canister number
- sample number
- sample date
- sampled canister pressure
- post sampling flow checks
- adjusted flow checks (if performed)
- summary of site activities and observations.

6.2 Canister COC Form Review

Prior to shipping the sampled canister and canister COC form to the laboratory for analysis, review the entries recorded on the sampler COC form. Make sure all fields in the “**Pre-Sample (Lab)**” section and all fields in the “**Sample Setup and Collection (Field)**” section are filled out completely and legibly.

Make corrections as needed but do so in a manner that does not obliterate the original entry or make the original entry unreadable.

7.0 FILE MANAGEMENT

7.1 Site Logbook

The site logbook should be stored at the monitoring site close to the sampler. If the site logbook becomes damaged or is full, contact the laboratory to ship a new site logbook.

7.2 Canister COC Form

The canister COC form contains 4 carbonless copies (gold, pink, yellow, and white). The laboratory removes the gold copy of the form when the unsampled canister is shipped to the sampler operator.

Before shipping the sampled canister and COC form back to the laboratory for analysis, remove the pink copy (bottom copy) of the COC form and store this copy in a known location that can be easily found if needed. If the lab did not remove the gold copy, remove the gold copy and pink copy. Ship the gold copy back to the laboratory in the next canister shipment.

Store the pink copy in a file folder at the field site or in a file folder at the sampler operators' primary workstation. The pink copies of the COC form may come in handy if historical sample collections need further review or if the remaining carbonless copies of the canister COC form become lost or damaged.

8.0 QUALITY ASSURANCE & DATA HANDLING

Quality assurance activities for this sampling method involve recording accurate and legible entries on the canister COC form and site logbook. Any errors that are found and corrected must be corrected in a way that does not obliterate the original entry. Additionally, the sampler operator must ensure the flow meter used to measure and adjust sampler flow rates is valid (within current NIST calibration) and that a copy of the NIST calibration certificate is always kept with the flow meter. This can be achieved by keeping a copy of the flow meter NIST calibration certificate in the flow meter carrying case.

9.0 TROUBLESHOOTING AND CORRECTIVE ACTIONS

9.1 Leak Check Issues

Failing leak checks typically occur in the sampler flow path or in the quick-connect fittings. When a failing leak check occurs, check the canister quick-connect fittings first. Remove the canister and inspect the canister fill line quick-connect fitting and the canister quick-connect fitting for debris, scratches, or other damage that may affect leak tightness of the fitting. Using your thumb and index finger attempt to tighten the quick-connect fitting on the canister. If no debris or damage to the fittings is observed and the canister quick-connect fitting is properly attached to the canister, reinstall the canister, and perform the leak check again.

If the failing leak check persists, remove the sampler fill line from the sampler and cap the sampler outlet port using the appropriate Swagelok plug fitting. Turn on the sampler pump and allow the sampler pressure gauge to reach approximately 20 pounds per square inch gauge (psig) and turn off the pump. Record the starting pressure and wait approximately 5-10 minutes and record the ending

pressure. Determine the pass/fail status of this leak check. Record this test in the comments section of the COC form. If the leak check fails, more than likely the sampler needs service. If the leak check passes without the sampler fill line installed and plugged sampler outlet port, more than likely the canister, quick-connect fittings, or Swagelok fittings of the fill tube are the source of the leak. Contact the laboratory to schedule replacement of the canister, sampler, fill tube, or quick-connect fittings.

9.2 Flow Meter Issues

When the flow meter cartridge expires or needs replacement due to damage, contact the laboratory for a shipping label. Ship your flow meter back to the laboratory for flow meter cartridge replacement or repair. If an expired flow meter must be used for flow verifications, include a comment on the canister COC form indicating an out-of-date flow meter was used for flow verifications. Using an out-of-date flow meter does not in-validate the sample collection but will require any VOCs detected in the sample to be qualified prior to reporting.

9.3 Site Shelter Issues

If excess vegetation growth is observed, note the observation in the site logbook and plan to perform vegetation removal on a non-routine sample date, preferably the day after a sampling event completes and no later than the day before the next sample collects. In the site logbook, record a summary of the vegetation removal process and the initial and date of who removed the vegetation and when the vegetation was removed.

If insecticide must be applied, make all efforts to apply insecticide to the site shelter on a non-routine sample date, preferably the day after a completed sampling event and no later than the day before the next sample starts collecting. In the site logbook, record a summary of the insecticide application.

9.4 Sampler Inlet Line Issues

The sampler inlet line that is outside the site shelter may become damaged over time or after exposure to inclement weather. Use heavy duty zip ties to attach the candy section of the sampler inlet line to the site shelter. Never climb a site shelter roof unless an additional staff member is present at the site to act as a spotter.

The sampler inlet line that is inside the site shelter should be covered with pipe insulation to help reduce the occurrence of moisture condensing on the inside of the sampler inlet line. Condensed moisture can remove water soluble VOCs from the ambient air stream, biasing the concentrations detected in the canister samples. Cover exposed lines with pipe insulation and secure the pipe insulation with tape or zip ties.

Contact the laboratory to schedule a sampler inlet line replacement if the line is broken or kinked. Also contact the laboratory for additional sections of pipe insulation or procure your own supply of pipe insulation. If the sampler inlet line is not sufficiently insulated and cannot be sufficiently insulated prior to the next sample collection, schedule the sample but include a comment on the COC form such as "sampler inlet line not insulated" or something similar.

9.5 Failed Sample Collections

Occasionally, samples fail to collect for a variety of reasons. Sometimes the reason for the missed sample is obvious such as the timer is scheduled for the wrong day, or the operator forgets to program the timer, or the operator forgets to open the canister valve after the passing leak check is achieved.

Sometimes the reason for the missed sample is not so obvious such as the timer was set properly, the canister valve was opened, and the sampler pump is working properly but somehow still failed to collect a valid sample. Many of the not-so-obvious missed samples are due to non-visible issues such as moisture build up on the sampler flow orifice during sample collection. When the flow orifice is plugged with moisture, ambient air will not be pumped into the canister even if the sampler pump appears and sounds operational.

If the canister was installed on the sampler and it's proven the canister valve was open, do not reuse the canister even if the canister is still under vacuum. Document the missed sample on the canister COC form and ship the canister and COC form back to the laboratory. Place a comment on the COC form requesting the laboratory to send a make-up sample or contact the laboratory directly to schedule shipment of a make-up sample canister.

10.0 REVISION HISTORY

1. Revision 0 SJW 6/7/2022

11.0 REFERENCES

1. Technical Assistance Document for the National Air Toxics Trends Stations Program, Revision 3, Prepared for: U.S. Environmental Protection Agency Office of Air Quality Planning and Standards (C304-06) Research Triangle Park, NC 27711.
https://www3.epa.gov/ttnamti1/files/ambient/airtox/NATTS%20TAD%20Revision%203_FINAL%20October%202016.pdf
2. Compendium Method TO-15 Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially Prepared Canisters and Analyzed by Gas Chromatography Mass Spectrometry (GC-MS), Center of Environmental Research Information Office of Research and Development U.S Environmental Protection Agency Cincinnati, OH 45268, January 1999.
<https://www3.epa.gov/ttnamti1/files/ambient/airtox/to-15r.pdf>
3. Xonteck Model 911 Canister Sampler User Manual. Xonteck, Inc. 4009 Clipper Court, Freemont, CA, 94538. Xonteck company website with sampler information: <https://xonteck.com/911.html>

12.0 APPENDICES

12.1 VOC Canister Chain of Custody Form

NC DAQ Laboratory Analysis Branch Air Sampling Canister Chain of Custody							
NC Division of Air Quality Laboratory 4403 Reedy Creek Rd Raleigh, NC 27607 (919) 733-9777				Sampling Site			
				Sample #			
Pre-Sample (Lab)							
Canister #	Cleaning Batch #	Canister Vacuum Inches Hg (Lab)	Canister COC #	Canister COC Sealed by Initials, Date, & Time (Lab)			
Sample Setup and Collection (Field)							
Sampler ID#: _____		Flow meter ID#: _____		<input type="checkbox"/> Sampler COC seal intact		<input type="checkbox"/> Canister COC seal intact	
<input type="checkbox"/> Exp. Date Checked		<input type="checkbox"/> Exp. Date Checked		<input type="checkbox"/> Same # as sealed		<input type="checkbox"/> Same # as sealed	
Sampler COC Broken by Initials, Date, & Time		Canister COC Broken by Initials, Date, & Time		Canister Vacuum Inches Hg (Field)		Leak Check (psig) (≤ 0.1 psi over 10 min)	
						Start	End
						Diff.	Pass/Fail
<input type="checkbox"/> Timer Clock checked against NIST <input type="checkbox"/> Timer Adjusted (Details noted in comments below)							
Pre-Sampling Avg Flow Check: _____ mL/min				#1:	#2:	#3:	#4:
Acceptable Range: 8 mL/min to 12 mL/min (max)							
Sampling Date & Day	Timer Start Time	Timer End Time	Canister Pressure (psig)	Sampler COC #		Canister and Sampler COCs Sealed by Initials, Date, & Time	
				Canister COC #			
Post-Sampling Avg Flow Check: _____ mL/min				#1:	#2:	#3:	#4:
Acceptable: 8 mL/min to 12 mL/min (max)							
Adjusted Sampling Avg Flow Check: _____ mL/min				#1:	#2:	#3:	#4:
Acceptable: 8 mL/min to 12 mL/min (max) (NA = No Adjustment)							
Comments:							
Post Sampling (Lab)							
Sample Received by Initials, Date, & Time		<input type="checkbox"/> Canister COC seal intact <input type="checkbox"/> Same # as sealed		COC Broken by Initials, Date, & Time		Canister Pressure psig (Lab)	
Comments:							
Intra-Laboratory Canister Transfers							
VOC Lab Relinquished by:				Date/Time:			
PAMS Lab Received by:				Date/Time:			
Revision Number: 0.0 Effective Date: 05/01/2020							