



Instructions for State, Local, and Tribal Organizations for Collecting and Providing Filter Samples from Collocated Ambient Air Samplers to the U.S. EPA's Lead Performance Evaluation Program (Pb-PEP)

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U.S. EPA's Lead Performance Evaluation Program (Pb-PEP)**

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FOREWORD

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1.0 INTRODUCTION

What is the Lead Performance Evaluation Program (Pb-PEP)? Short Answer: The Pb-PEP is the Environmental Protection Agency (EPA)'s program for assessing Pb measurement bias in the national Pb monitoring network for National Ambient Air Quality Standards (NAAQS) attainment. Pb-PEP samples are analyzed at an EPA laboratory following a Federal Reference Method (FRM), and the results are compared to coincident Pb measurements performed by State, Local, and Tribal (SLT) agencies. Pb-PEP data are available to data users through EPA's online Air Quality System (AQS) database.

Detailed Answer: Under the auspices of the Clean Air Act (CAA), the EPA's Office of Air Quality Planning and Standards (OAQPS) is charged with ensuring that the nation's Ambient Air Quality Monitoring Program network generates data that are sufficient in quality and quantity to meet their primary use: providing the information needed to determine attainment (or non-attainment) with NAAQS. Pb is one of the criteria pollutants regulated through the CAA and measured within the national monitoring network. Therefore, the quality of the Pb concentration data generated must be assessed frequently.

This document addresses only high-volume Pb sampling in total suspended particulate (TSP).

The Pb-PEP serves as the element of OAQPS's quality system that assesses bias in Pb concentration data measured within the national Pb monitoring network (whose sites are operated by SLT agencies across the country). EPA developed an implementation plan¹ for the Pb-PEP in 2009 which describes the overall conduct of the Pb-PEP. Bias is typically assessed by comparing ambient measurements against measurements taken of a certified standard, but because it is not possible to formulate and introduce a certified Pb standard to a Pb ambient air sampler in its normal operation, EPA has implemented the Pb-PEP as an alternative assessment for evaluating bias.

The Pb-PEP is an independent monitoring program that collects ambient air samples at selected Pb network sites and submits the samples for Pb analysis to a central laboratory (the "Federal independent Pb-PEP laboratory"). It utilizes sample collection and laboratory analysis procedures that are as stringent, and often more stringent, in their quality assurance/quality control (QA/QC) requirements than those in the national Pb monitoring network. The Pb-PEP serves as the "gold standard" against which measurements from the national Pb monitoring network are compared and assessed for quality.

As of September 15, 2021, the Federal independent Pb-PEP laboratory is hosted by the EPA Region 4 Laboratory Services and Applied Sciences Division, Athens, GA.

What dictates the requirements for the Pb-PEP? The Code of Federal Regulations (40 CFR Part 58 Appendix A²) specifies the quality system requirements implemented by OAQPS for measuring bias through the Pb-PEP. Additionally, EPA has developed a quality assurance project plan (QAPP)³ to further define the quality system for the Pb-PEP.

What is the role of SLT agencies in the Pb-PEP? Short Answer: SLT agencies have two roles in the Pb-PEP. First, SLT agencies allow for independent Federal EPA Pb-PEP auditors to access their monitoring sites and collect a limited number of samples each year. Secondly, the SLTs are responsible for collecting a prescribed number of Pb-PEP samples required for each primary quality assurance organization (PQAO) annually.

Detailed Answer: The success of the Pb-PEP in achieving its critical role of assessing data quality in the national Pb monitoring network is contingent on each program participant achieving its assigned responsibilities and expectations completely and following requirements in 40 CFR Part 50 Appendix B and Part 58 Appendix A. Such requirements and expectations are documented in EPA's Pb-PEP QAPP, EPA's Pb-PEP Field Standard Operating Procedure (SOP) document,⁴ and in this instruction document. The field sampling portion of the Pb-PEP involves two components in which SLT agencies have a role:

- **EPA Independent Pb-PEP sampling events:** These events are conducted by field scientists (FSs) who are independent of the SLT's PQAO Pb monitoring program. The FS may be an EPA employee or a contractor deployed from the EPA Region in which the Pb network monitoring site hosting the Pb-PEP sampling event is located. In a few instances, SLT agencies have requested self-implementation of the field operations for which they provide an auditor or a contractor for conducting the EPA independent Pb-PEP sampling events. The FS transports a dedicated Pb-PEP sampler to a Pb network site, collocates it with the site's primary routine sampler, and collects a Pb filter sample over the same period and on the same day that the SLT's primary sampler collects its Pb sample. FSs performing the EPA independent Pb-PEP sampling event must coordinate with SLT agency site operators for obtaining access to sites and scheduling the start and end of Pb-PEP sample collection.

The EPA independent collocation events are rotated through each PQAO's Pb network site(s), at least once every six (6) years.

- **SLT Collocated Pb-PEP sampling events:** For these events, the SLT agency assumes the responsibility for collecting a prescribed number of samples specifically for the Pb-PEP and shipping them to the Federal independent Pb-PEP laboratory for analysis. To collect a Pb-PEP sample, a SLT agency uses a Pb sampler which it has permanently collocated with the primary (routine) Pb network sampler at a monitoring site. This collocated Pb sampler is called a "precision" sampler because its primary purpose is to collect samples to estimate precision in the Pb network. (SLT agencies are required to deploy and run collocated Pb samplers at 15% of their network sites for this purpose.)

The analysis of the SLT collocated Pb-PEP samples provides information that can be used to determine if a significant difference is present in Pb measurements between the SLT's laboratory and the Federal independent Pb-PEP's laboratory. Disparate results may indicate a difference in sample collection and/or handling between the SLT's routine and precision samplers, or a difference in the analytical procedures used by the two programs.

Thus, this collocated "precision" sampler collects two types of Pb samples:

- **Routine collocated sample (for measuring network precision):** For purposes of characterizing precision, the SLT site operator collects a Pb sample from the

collocated sampler at a frequency of no less than half of the rate of collecting Pb samples from the site's primary network sampler. (Both the primary sample and the precision sample are collected at the same time.) The SLT agency ships both samples to its analytical service laboratory for Pb analysis.

- **SLT collocated Pb-PEP sample:** When collecting a Pb sample for the Pb-PEP, the SLT site operator collects a sample from the collocated sampler on a date that the site's primary Pb sampler is to collect a routine Pb filter sample, but the collocated sampler is not scheduled to collect a routine precision sample. The SLT agency ships the Pb-PEP sample to the Federal independent Pb-PEP laboratory, which analyzes all samples collected by all Pb-PEP participants.

Through September 14, 2021, **all Pb-PEP samples** were analyzed by the EPA Region 9 Pb-PEP analysis laboratory in Richmond, California. The Region 9 lab was closed on September 15 for a physical move to Corvallis, Oregon. It may take a year or more to bring the western-based Pb-PEP support laboratory back online. Meanwhile, EPA Region 4's Laboratory Services and Applied Sciences Division, Athens, GA, is serving as the Federal independent Pb-PEP laboratory until the move is complete. Region 4's Pb-PEP laboratory became operational on September 15, 2021

What is the purpose of this document? This document provides guidance and direction to SLT agencies when performing Pb-PEP sampling events at one or more Pb network monitoring sites. For the Pb-PEP sampling events, the SLT agency follows its established field SOP for collecting Pb filter samples. SLT agencies are encouraged to update their SOP to incorporate procedures described within this document to conform to the Pb-PEP QAPP³ and the Pb-PEP Field SOP⁴.

Note: The EPA Pb-PEP Field SOP⁴ does not specifically address SLT collocated Pb-PEP sampling events, but details best practices and describes procedures EPA has adopted to provide confidence that Pb-PEP filter samples are collected and analyzed consistently, which better represents bias at both the PQAQO and national levels of aggregation.

This document addresses only high-volume Pb sampling in which the sampler draws 1.1 to 1.7 cubic meters per minute (m³/min) of air, or roughly 1,518 to 2,550 m³ over a 24±1 hour sampling period, through an 8×10-inch glass fiber filter (GFF). The sampling method is described in 40 CFR Part 50 Appendix B which details the performance requirements for high-volume total suspended particulate (TSP) samplers.

2.0 SITE FREQUENCY AND SELECTION CRITERIA FOR PERFORMING Pb-PEP SAMPLING EVENTS

How many Pb-PEP SLT collocated sampling events does an SLT agency need to perform per year? **Short Answer:** Within a PQAQO, SLT agencies are required to perform either four (4) or six (6) SLT collocated Pb-PEP sampling events annually depending on the number of Pb network sites which the PQAQO oversees.

Detailed Answer: When data are to be used to determine NAAQS attainment, the quality of the data is evaluated at the PQAQO level. Therefore, the required number of annual Pb-PEP sampling events is assigned at the PQAQO level. In a given calendar year, a PQAQO must perform Pb-PEP sampling events at those Pb network sites that host collocated "precision" samplers; these sites are distributed across the SLT agencies in the PQAQO as described below:

- PQAOs responsible for **five or fewer (≤ 5)** Pb network sites must ensure **four (4)** valid SLT collocated Pb-PEP sampling events are performed per year.
 - In addition to the four (4) SLT collocated Pb-PEP sampling events, the EPA Region or self-implementing auditing group is responsible for performing **one (1)** Federal EPA independent Pb-PEP sampling event annually within the PQAO to satisfy the requirement that five (5) total Pb-PEP sampling events are conducted annually. This Pb-PEP sampling event involves use of an independent (portable) Pb sampler deployed by the Federal FS (EPA or EPA contractor) or independent, self-implementing SLT QA field operative.
- PQAOs responsible for **more than five (> 5)** Pb network sites must ensure **six (6)** valid SLT collocated Pb-PEP sampling events are performed per year.
 - In addition to the six (6) SLT collocated Pb-PEP sampling events, the EPA Region or self-implementing auditing group is responsible for performing **two (2)** Federal EPA (independent) Pb-PEP sampling events annually within the PQAO to satisfy the requirement that eight (8) total Pb-PEP sampling events are conducted annually.

When should Pb-PEP sampling events be scheduled? **Short Answer:** An SLT collocated Pb-PEP sampling event must occur on a primary sampling day and would ideally be conducted once or twice per calendar quarter to allow Pb-PEP sampling to be spread out evenly throughout the year. Noting that ambient concentrations around the country continue to decrease and that measurable Pb concentrations are a function of seasonal variation in many instances, additional preference can be given to conducting Pb-PEP sampling in seasons that are more favorable to generating higher Pb concentrations or at sites with high incidence or probability of measuring ambient Pb concentrations exceeding $0.002 \mu\text{g}/\text{m}^3$ (the minimum acceptable Pb concentration by AQS when implementing its statistical algorithm for calculating bias).

Detailed Answer: EPA has established a recommended Pb-PEP sampling schedule for each calendar year – this schedule is available at the following link on EPA’s AMTIC website:

[Link to AMTIC's Sampling Schedule Calendar](#)

Within the national Pb network, routine network sites must minimally collect a primary sample every six (6) days, while certain sites must sample every three (3) days. For those Pb network sites that host a secondary (precision) Pb sampler, the SLT agency is required to collect a collocated Pb sample for network precision purposes once every 12 days at a minimum – more frequent precision sampling is discretionary.

Because SLT collocated Pb-PEP sampling events utilize the same collocated samplers that the SLT agencies use to collect precision samples, these Pb-PEP sampling events must occur on a date when a primary network sample is being collected, but **not** when the collocated sampler is normally scheduled to collect a precision sample. The collection duration of the Pb-PEP samples must correspond to the same 24-hour period (± 1 hour) as the primary network samples.

Figure 1 includes a calendar containing a hypothetical Pb sample collection schedule for a given month, for a Pb network site which is eligible to host an SLT collocated Pb-PEP sampling event (as it contains a permanent precision sampler) and at which primary network sampling for NAAQS attainment occurs every six (6) days. This calendar assumes sampling can be initiated on any day of the week (including Saturdays and Sundays) and notes the following:

- The dates on which sample collection occurs for determining NAAQS attainment are shown as Primary on the calendar in Figure 1. In this example, primary (network) sampling occurs once every six (6) days, and thus five (5) times in the given month (e.g., 2nd, 8th, 14th, 20th, and 26th). Thus, an SLT collocated Pb-PEP sampling event can theoretically occur only on these five (5) dates in this particular month.
- However, the dates on which precision sampling occurs at the site using the permanent precision (collocated) Pb sampler are shown as Precision on the calendar. Precision sampling occurs once every 12 days and in this particular month occur on the 2nd, 14th, and 26th. These Precision days are ineligible for scheduling an SLT collocated Pb-PEP sampling event as the sampler is being used for routine precision sampling.
- Consequently, the dates available for scheduling an SLT collocated Pb-PEP sampling event at the site are labeled as Pb-PEP on the calendar. **Only two days are available for Pb-PEP sampling in the given month (8th and 20th).**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2 Primary Precision	3	4	5	6	7	8 Primary Pb-PEP
9	10	11	12	13	14 Primary Precision	15
16	17	18	19	20 Primary Pb-PEP	21	22
23	24	25	26 Primary Precision	27	28	29

Figure 1. Example Pb-PEP Sampling Schedule for Routine Network Pb Sampling Occurring Every 6 Days and Collocated Precision Sampling Occurring Every 12 Days

Note: This example shows that a monitoring site for which Primary samples are collected for NAAQS attainment following a one-in-three (3)-day sampling schedule and for which precision sampling occurs on a one-in-six (6)-day schedule may provide as many as two (2) available dates in a given month to schedule a Pb-PEP sampling event.

Regulations require Pb concentrations collected in the Pb-PEP are $\geq 0.002 \mu\text{g}/\text{m}^3$ for use in bias evaluations. Concentrations lower than this threshold are recorded in AQS but are excluded from the bias statistics.

While Pb-PEP sampling events would ideally be distributed as evenly as possible across the four calendar quarters each year, priority should be placed on performing these sampling events in

those months/seasons expected to have higher Pb concentrations, which may be informed by considering historical data. The strategy is to improve the odds that the ambient Pb concentration on a given sampling date will exceed $\geq 0.002 \mu\text{g}/\text{m}^3$. A site's predominant meteorological conditions (e.g., wind direction, precipitation) can influence its measured Pb concentrations and should be considered when scheduling a Pb-PEP sampling event.

Example: At a site located near a Pb emissions source, the prevailing winds in summer months have the site located downwind of the Pb source, but they shift in the winter months to where the site is upwind or crosswind of the Pb source. In this scenario, scheduling a Pb-PEP sampling event at the site during the summer is preferable.

Is there a minimum number of Pb-PEP sampling events performed at a collocated Pb network site annually or over a longer period? For example, if a PQAO has more than one collocated site, over what cycle of years should all of those collocated sites provide at least one cycle.

Short Answer: There is no requirement of this type. However, EPA recommends conducting Pb-PEP sampling events more frequently at sites with consistently higher Pb concentrations to increase the likelihood of collecting the specified number of samples with sufficient Pb ($\geq 0.002 \mu\text{g}/\text{m}^3$) to include in the bias assessment.

Detailed Answer: While there is no requirement for how often a Pb network site should be subject to hosting an SLT collocated Pb-PEP sampling event, PQAOs and SLT agencies should prioritize events to occur at network sites with the highest Pb concentrations to maximize the likelihood of collecting a Pb-PEP sample with a measured Pb concentration $\geq 0.002 \mu\text{g}/\text{m}^3$. PQAOs typically oversee between one and three Pb network sites with both primary and permanent precision (collocated) Pb samplers. To achieve the required four (4) or six (6) annual SLT collocated Pb-PEP sampling events, these events can be evenly spread across the sites such that each site hosts one or more such events each year. However, if one or more of these sites report relatively higher Pb concentrations, EPA recommends prioritizing these higher Pb concentration sites. In general, sites having Pb concentrations $< 0.002 \mu\text{g}/\text{m}^3$ more than 50% of the time should be placed at a lower priority for hosting SLT collocated Pb-PEP sampling events.

Example: A PQAO required to perform six (6) SLT collocated Pb-PEP sampling events each year operates three Pb network sites which host a permanent collocated Pb sampler. If, historically, higher Pb concentrations have been observed at one (1) of these sites compared to the other two (2), then the SLT collocated Pb-PEP sampling events could be prioritized to occur more often at this site with the higher Pb concentration. In this case, each of the other two (2) sites could host an SLT collocated Pb-PEP sampling event once per year, and the four (4) remaining events could occur at the site with the highest Pb concentrations (a four-one-one [4-1-1] combination each year). Additionally, if historical Pb concentrations for one or both of the lower-concentration sites indicate that Pb concentrations are $\leq 0.002 \mu\text{g}/\text{m}^3$ more than 50% of the time, then these lower-concentration site(s) can host events even less frequently. If this is the case, then a given year may include a five-zero-one [5-0-1] SLT collocated Pb-PEP sampling event combination. This plan would achieve the annual SLT collocated Pb-PEP frequency requirements while also providing a greater probability that Pb concentrations from the Pb-PEP sampling events will exceed the $0.002 \mu\text{g}/\text{m}^3$ requirement for bias measurement.

3.0 Pb-PEP FILTER MEDIA ACQUISITION AND HANDLING

What type of sample filter is used in Pb-PEP sampling events, and where can these filters be acquired? Short Answer: The Pb-PEP employs 8×10-inch glass fiber filters (GFFs) with a collection efficiency $\geq 99\%$ for particles no greater than 0.3 μm in diameter. These are the same filters EPA makes available for monitoring agencies to perform routine Pb sampling. EPA makes these filters available to SLT agencies for Pb-PEP sampling. Quartz fiber filters (QFFs) of the same specification may be substituted in certain situations as described below.

Detailed Answer: The EPA Federal independent Pb-PEP laboratory utilizes GFFs in high-volume samplers. The filters are 8×10-inch GFFs with a collection efficiency $\geq 99\%$ for particles 0.3- μm in diameter. These are prescribed for Pb sampling in the Federal Reference Method. EPA strongly prefers that the SLT site operators also utilize GFFs for their Pb-PEP sampling events, as practical, to limit the number of operational variables in the national bias measurement.

The OAQPS National Pb-PEP Lead (see box) can provide SLT agencies with boxes of new (pristine, unexposed) GFFs upon request. The SLT agency should request enough filters to cover Pb-PEP samples and the associated field quality assurance (QA) samples including field blanks (FBs), trip blanks (TBs), and filter lot blanks. Filters older than two (2) years become brittle and should be discarded. Filter media exhibiting excessive brittleness prior to the two (2)-year period should also be retired.

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Use of QFFs is permitted (although it is discouraged) for collecting Pb-PEP samples in either of the following scenarios:

- If the precision (collocated) sampler cannot achieve the required flow rate (between 1.1 and 1.7 m^3/minute) when using a GFF, or
- If the flow rate of the precision collocated sampler differs from the primary sampler's flow rate by more than 7% when using a GFF and the precision sampler's flow rate cannot be adjusted to within $\pm 7\%$ of the site's primary sampler.

To request new GFFs for collecting Pb-PEP samples and associated field QA samples or for any questions or problems related to the filters, contact the National Pb-PEP Lead. Be sure to include the shipping address of the recipient.

What are the filter inspection and handling specifications? Short Answer: A representative portion of filters provided by EPA is inspected and performance tested to evaluate background Pb levels prior to shipment. However, GFFs should be visually inspected when received for defects that would compromise sample collection or analysis (i.e., discolorations, tears, thin spots, pinholes, etc.), and unsuitable filters discarded. Individuals should wear gloves when handling GFFs and should use care to avoid creasing, damaging, or contaminating filters with dust or other debris. Filter samples should only be handled by the edge and should be treated with care to avoid dislodging captured particulate matter (PM).

Detailed Answer: Both when receiving new, unexposed filters and after sampling has occurred, a filter integrity check should occur to visually inspect for pinholes, separation, chaff, loose

material, discoloration, undue brittleness, or filter non-uniformity. If a defective filter is discovered prior to a sampling event, the filter should be voided and replaced. If filter defects are discovered after the conclusion of the sampling event, then the downstream portion of the sampler where the filter rests in the sampler should be inspected to determine if PM has been bypassing the filter. These findings and the filter defects should be documented on the chain of custody/field data sheet (COC/FDS) form. Any appreciable breakthrough or PM bypass is reason to reject the sample.

Care must be taken when handling both exposed and unexposed filters. Filters should be handled in a manner to prevent them from being damaged or contaminated. A large amount of PM (typically several micrograms) can be deposited on filters during sampling and can be dislodged by improper (rough) handling resulting in a major source of error. To prevent contamination, GFFs should only be handled by the edges, and the filters should be loaded/unloaded in the transport cassette/carrier in a clean area. The transport cassette should have a snap cover that should remain installed during handling unless the sample is installed in the sampler. See Section 5 for more information on preparing collected filter samples for shipping.

4.0 FIELD AND SAMPLING PROCEDURES

The field sampling procedures for Pb-PEP sampling events can be grouped into four sequential sets of activities:

1. Preparation and setup (installing the filter) of the event.
2. Collecting the sample onto the filter.
3. Retrieving the filter and shipping it to the laboratory for Pb analysis.
4. Completing all field data documentation (e.g., COC/FDS).

Data from COC/FDS are critical inputs for the Pb-PEP validation; incomplete COC/FDS data have historically been a challenge when producing valid data from SLT collocated Pb-PEP sampling events. EPA has developed a limited access website, AirQA ([website link to AirQA](#)), to facilitate sample collection and data processing procedures, to help minimize missing or erroneous COC/FDS data.

What is the AirQA website? **Short Answer:** AirQA is an online resource for housing Pb-PEP guidance documents, transmitting and processing Pb-PEP data, tracking the progress of Pb-PEP samples, and providing a QA review interface of Pb-PEP data for EPA staff.

Detailed Answer: The EPA maintains, through our QA support contractor, the AirQA website and supporting database to support the Pb-PEP as well as the PM_{2.5}-PEP and OAQPS's Ambient Air Monitoring Protocol Gas Verification Program (AA-PGVP). Pb-PEP participants, stakeholders, and decision makers who use the results of the Pb-PEP should have access to the website and its contents. Resources, such as this document, for Pb-PEP field sampling procedures and SLT collocated Pb-PEP sampling can be found on the AirQA website.

Figure 2 illustrates the AirQA login page and the subsequent user registration page (for those wishing to obtain credentials to access the website). SLT agency site operators and/or delegated data managers, along with her/his direct supervisor, are eligible to gain access. Typically, within approximately 24 hours after requesting access, the AirQA technical support contractor will set

the appropriate access level and grant access to AirQA. Technical assistance with the website is available through the Contact Us link on the home page.

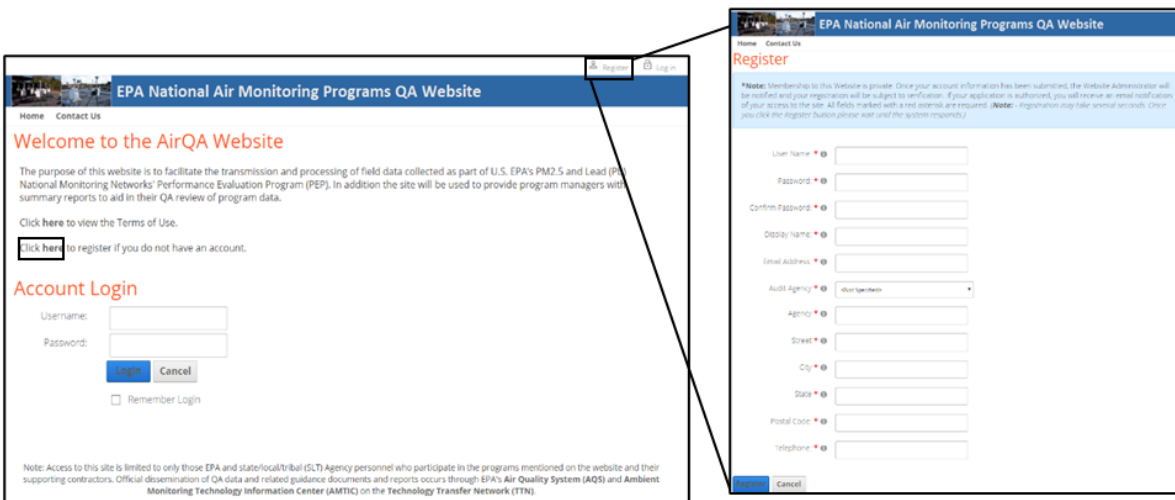


Figure 2. AirQA Login (left) and Registration Pages (right)

Note: The AirQA registration page can be accessed from the “Register” link in the upper-right or the “Click here” link at the middle-left of the log-in page, as illustrated by red boxes here (left screen). Registrants then create a username and password and provide contact and agency information (right screen). It usually takes less than 24 hours for a registration request to process at which point a user can access the AirQA website.

Where can a COC/FDS form be found and how is it to be filled out? Short Answer: Once logged into AirQA ([website link to AirQA](#)), hover over “PEPs” to reveal a drop-down menu, click on “Pb-PEP”, and click on the “SLT Site-Collocated COC Form and Field Data Sheet” icon. Completing the form is straightforward. Note that to ensure the Pb-PEP sample data are processed in concert with Region 4’s ISO 17025 accreditation requirements and input to EPA’s AQS ([AQS website link](#)), the SLT agency must complete and submit both an (1) electronic version to the AirQA website and (2) a hard copy of a COC/FDS form (the electronic form can be printed and signed) to be shipped to the Pb-PEP analytical lab along with the sample filter(s).

COC/FDS data captured in SLT collocated Pb-PEP sampling events must be input using the correct form on AirQA. Incorrectly selecting the “EPA or Independent Audit” COC/FDS will cause the data base to invalidate an SLT’s sample from a collocated site!

Detailed Answer: When collecting samples (and their associated field QA samples) for the Pb-PEP, the SLT agency is responsible for initiating the hardcopy COC/FDS. EPA encourages use of the COC/FDS (Appendix A) for Pb-PEP available through the AirQA website for efficient and effective recordkeeping across the network. The COC/FDS can either be printed from the AirQA website and the hardcopy completed in the field, or be completed electronically on the AirQA website while in the field (if there is reliable internet access at the site). It is the sole responsibility of the SLT agency performing the Pb-PEP to complete and submit the electronic version of the COC/FDS on the AirQA website. Failure to do so prevents corresponding entry of

lab results to the AirQA database. **Figure 3** illustrates the following three (3) steps for accessing the electronic COC/FDS (as numbered):

1. Access the Pb-PEP page from the AirQA homepage ([website link to AirQA](#)).
2. From the Pb-PEP page, select the icon labeled “SLT Site-Collocated” under the Field Data Sheets / Chain-of-Custody Forms. Ensure you do not mistakenly select the “EPA or Independent Audit” form (crossed out with an ‘X’ in Figure 3).
3. From the Pb-PEP SLT Field Data Sheet page, select “Add New.”

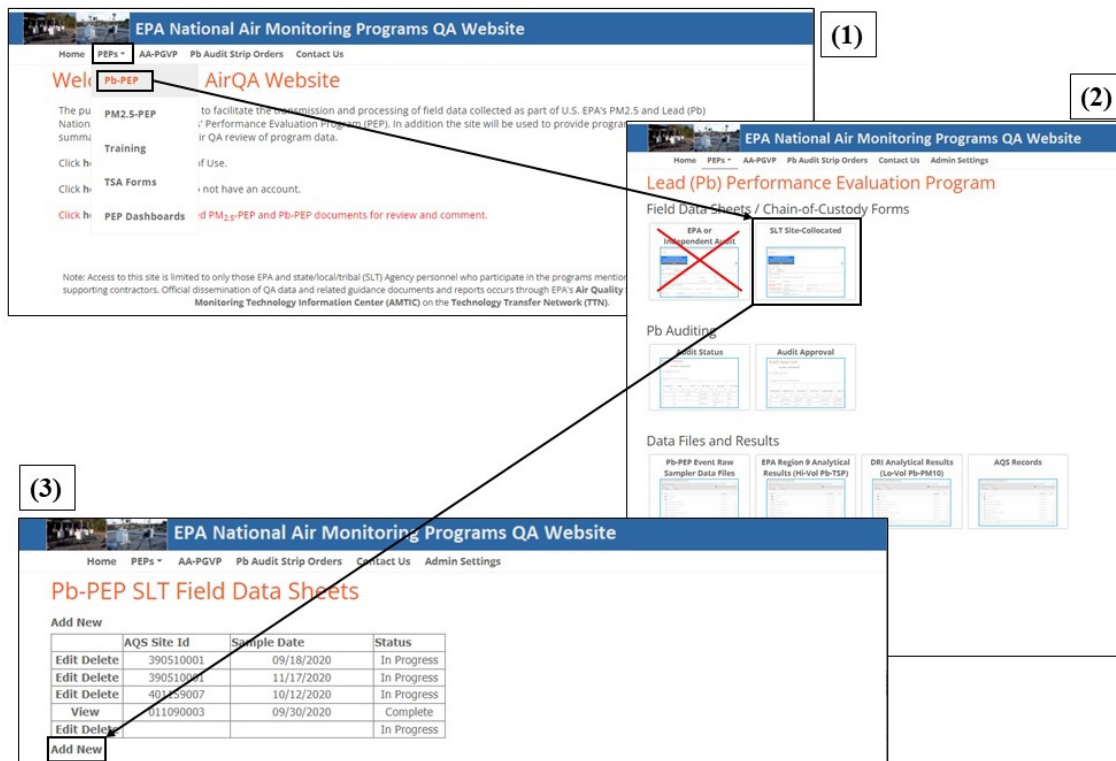


Figure 3. Three-step Process to Access the COC/FDS Form on AirQA

The electronic COC/FDS is then displayed and allows entry of requested information into the various fields. Once information has been entered in any field, the user can click “Save” to send the information to the supported database. Note that users can return to the form to enter additional information or update information at any point up until the sample is approved by the EPA Regional Pb-PEP Lead (at which point the sample data are locked from alteration).

Appendix A presents this online COC/FDS form; it highlights critical data fields in **bold text** which are required when completing the form. The form may be partially completed prior to a Pb-PEP sampling event and printed for accompanying the filter to the field for sample setup and retrieval. The sample collector can record the required sample collection details on the printed hard copy COC/FDS form. Once the sample filter is retrieved, the sample collector (or designee) must complete the online form and click “Submit” to complete the sample collection data submission to the supported database. Note that the electronic form will notify the user when

data entries do not comply with expected entries (e.g., text is entered in a field where a number is expected). At this time, a hardcopy of the COC/FDS must also accompany each Pb-PEP sample and blank filter to the Federal independent Pb-PEP laboratory.

What documentation is required when submitting SLT collocated Pb-PEP samples to the Federal independent Pb-PEP laboratory? Short Answer: The SLT agency must include a signed and dated COC/FDS with each Pb-PEP sample, trip blank, and field blank submitted to the Federal independent Pb-PEP laboratory. This COC/FDS must be completed from the electronic COC/FDS at the AirQA website. The sample shipment may also include a sample collection form routinely used by the SLT agency. See detailed answer below for required information to include on the form. Any siting issues will need to be detailed on the COC/FDS, even if a waiver was granted by the Regional Pb-PEP Lead.

Detailed Answer: The COC/FDS must clearly include the following details at a minimum:

- AQS site identifier (ID) (9-digit state, county, and site ID).
- Filter number (starts with G or Q followed by 7 digits, e.g., G1234567).
- Site name.
- Site operator name.
- Dates and times of sample collection start and stop.
- Elapsed sample collection time (must be 24±1 hours).
- Total collected volume in local conditions.
- Starting and ending sampling flow rates in local conditions.

The two critical parameters to determine ambient Pb concentration are the total volume passed through the filter during the event and the mass of Pb on the filter. If you are unfamiliar with finding the total sampled volume data from your sampler, consult the sampler manufacturer or vendor.

Note that because the Pb NAAQS design values are stated in units of “ $\mu\text{g}/\text{m}^3$ ” at local conditions, the flow rate and total volume measured during the Pb-PEP sampling process are also to be reported at local conditions. The COC/FDS (Appendix A) helps facilitate this functionality, but you may need to independently derive and record the average ambient temperature and barometric pressure if flow rate at local conditions is not measured by sensors on your sampler and reported in those terms. To help with this conversion, a monograph has been posted on the AirQA website and a converter function will be added to make the calculations.

If SLT agencies employ their own routine field sample collection form, it is highly recommended that the sample collector submit a completed hard copy of the AirQA COC/FDS (this can be filled out electronically and printed or completed by hand). All required information above must be recorded to validate the sample and associated data. The sample collector must record any siting issue with the permanently installed collocated sampler, even if the siting issue has been approved by a waiver from the EPA Regional Administrator. The COC/FDS also requests the date of the most recent flow calibration verification. **It is critically important that when completing Pb-PEP sample collection forms by hand, the data are recorded legibly. Illegible handwritten data on a signed COC/FDS will invalidate the sample.** The individual

relinquishing the sample must sign and date the COC/FDS and clearly indicate that the sample is submitted for the Pb-PEP.

Do not ship samples that are known to be invalid such as filters exhibiting damage, filters otherwise known to be compromised, or filters with values for the sample collection parameters which fall outside the ranges listed in **Table 1**.^{5,6} When samples are rendered invalid, it is necessary to schedule a make-up Pb-PEP sampling event.

Table 1. Acceptable Ranges for Sample Duration, Average Flow Rate, and Sample Collection Volume in the Pb-PEP

Sampling Duration Range	Average Flow Rate Range (Local Conditions)	Sample Collection Volume Range (Local Conditions)
24 ± 1 hour	1.1 to 1.7 m ³ /min	1,518 to 2,550 m ³
1,440 ± 60 minutes	39 to 60 ft ³ /min	53,820 to 90,000 ft ³

Filter Sample Invalidation: Pb-PEP sample results will be automatically invalidated if:

1. Any of the critical criteria in Table 1 are not met.
2. A completed and printed COC/FDS does not physically accompany the filter to the Federal independent Pb-PEP laboratory.
3. The COC/FDS cannot be matched with its respective Pb-PEP filter (i.e., the proper Filter ID is not present).
4. The COC/FDS omits required (critical) information or the information is illegible. Examples of some historical consistency are the absence of the AQS site ID number or mismatching sample dates between the SLT's routine sampler and the collocated sampler.

How are sampling procedures for the SLT collocated Pb-PEP (for bias assessment) different from those for 1-in-12-day collocated precision sampling? **Short Answer:** The main difference is that the Pb-PEP sample is shipped to the Federal independent Pb-PEP laboratory, NOT the routine SLT analytical laboratory. Additional documentation is required for the Pb-PEP sample (within the COC/FDS available on the AirQA website), and sample collectors will need to collect a FB and TB for half of the Pb-PEP sampling events (details below).

Detailed Answer: When performing an SLT collocated Pb-PEP sampling event, the SLT site operator generally applies the same procedures used when collecting collocated 1-in-12-day precision samples. However, because the required quality level in the Pb-PEP sample measurements may be higher than for the SLT routine sample Pb measurements, the following additional procedures must be followed in the SLT collocated Pb-PEP sampling events:

1. As noted in Section 3, Pb-PEP samples should be collected using a GFF (provided by the OAQPS National Pb-PEP Lead) whenever possible.
2. Both a FB and TB are collected for 50% of the SLT collocated Pb-PEP sampling events (see below).

3. Per best practices, the Pb-PEP sample filter should be retrieved within 24 hours of the end of sample collection. Retrieval within 96 hours is permissible to accommodate the 1 in 6-day national routine schedule as well as holidays and weekends. While there are no technical limitations, minimal time is recommended to minimize the risk of sample contamination.
4. SLT agencies must enter the SLT collocated Pb-PEP sample data into the electronic COC/FDS on the AirQA website. If the sampler is equipped with data logging capabilities, the SLT site operator should upload the sampler run log/data file to the AirQA website (see below).

What QA samples are required during Pb-PEP sampling events? Short Answer: SLT site operators are required to collect the following blanks during Pb-PEP sampling events at the following frequency:

1. Field blanks (FBs): Collected for 50% of the SLT collocated Pb-PEP sampling events.
2. Trip blanks (TBs): Collected for 50% of the SLT collocated Pb-PEP sampling events.
3. Lot blank: Submitted to the Federal independent Pb-PEP laboratory when a new box of GFFs is opened.

Detailed Answer: The Pb-PEP requires three types of blanks: FBs, TBs, and lot blanks. FBs and TBs are collected for 50% of the SLT collocated Pb-PEP sampling events and are to be handled and treated identically to the exposed Pb-PEP sample filters. (To accommodate FBs and TBs, two additional filters should be allocated for 50% of the Pb-PEP sampling events.) Generally, these blanks should exhibit the following relative levels of Pb contamination:

(Pb concentration in the lot blank) < (Pb concentration in the TB) < (Pb concentration in the FB).

It is common for lot blanks and TBs to exhibit undetectable levels of Pb.

- The **FB** provides information on total measurement system (handling, collection, and analysis) contamination. The FB is collected by removing the filter cover, installing a blank filter into the sampler, exposing the filter for approximately one (1) to five (5) minutes while the sampler remains powered off (i.e., no air is pulled through the filter), and uninstalling the filter. Thus, FB collection occurs in the same manner as a routine sample filter (ready to begin the sampling process) except the sampler pump is not turned on and no air is pulled through the sampler. The FB is collected just prior to installing the intended filter for Pb-PEP sample collection.
- The **TB** provides information on possible contamination during handling and transportation to and from the Pb-PEP sampling event. The TB filter is collected by loading a new filter into a sampling cassette and transporting it to the Pb-PEP sampling event with the Pb-PEP filter intended for exposure. Once taken to the sampling site, the TB is shipped to the Federal independent Pb-PEP laboratory for analysis without having been exposed to any of the sampling procedures (e.g., it remains in a sealed plastic bag). It is removed from the cassette and prepared for shipment to the Federal independent Pb-PEP laboratory at the same time that the collected exposed filter is prepared for shipment. Since TBs are not installed in the Pb sampler, they provide a baseline of Pb contamination from handling and will serve as a comparator should the FB exhibit Pb contamination.

- A **lot blank** is a filter employed to establish the background level of Pb in virgin filter media. The lot blank filter is chosen randomly when opening a new box of filters or once every year if the box is used over two years. The lot blank is submitted to the Federal independent Pb-PEP laboratory for analysis.

How are Pb-PEP setup pre-check and post-check data uploaded to AQS? Short Answer: The SLT site operator enters field sample collection data into the electronic COC/FDS on AirQA (refer to Appendix A). Once the Pb-PEP laboratory reports the Pb analysis data to AirQA, the sample results are input to AQS.

Detailed Answer: Upon completion of an SLT collocated Pb-PEP sampling event, the SLT agency is responsible for ensuring the field collection data are properly entered into the electronic COC/FDS on the AirQA website (Appendix A). Following analysis of the Pb-PEP sample, the Federal independent Pb-PEP laboratory inputs the measured Pb mass into AirQA's database, the sample's field and laboratory data are matched, the data go through automated data validation checks, and a final in-air Pb concentration ($\mu\text{g}/\text{m}^3$) is calculated. Sample data that are invalid, based on the automated validation checks, do not progress further through the system and will not be input to AQS. Once the Pb-PEP data pass the required validation checks, the EPA Regional Pb-PEP Leads approve or reject the sample at which point the data are cleared to be uploaded to AQS (if not otherwise rejected). AirQA data uploads to AQS are performed approximately every month.

Note: AirQA applies automated validation checks as the Pb-PEP data are entered into the COC/FDS to notify users of invalid entries. The electronic COC/FDS provides error messages when required fields are omitted and for data which fall outside of designated/expected ranges (e.g., AQS site ID errors, collection durations outside of criteria). It also provides a summary table of validation checks to help ensure the validity of the data entry. EPA is developing another tool on AirQA to notify designated SLT contacts when a Pb-PEP sampling result is invalidated due to criteria errors or failures in the lab.

How are sampler raw data files from a Pb-PEP sampling event data uploaded to the AirQA website? Short Answer: Once logged into AirQA ([website link to AirQA](#)), hover over "PEPs", click "Pb-PEP," and click on the icon labeled "Pb-PEP Event Raw Sampler Data Files." Select the folder for the appropriate EPA Region for the monitoring site and then click the upload button. Enter the filename in the pop-up window and ensure the filename includes the sample date and the filter ID.

Detailed Answer: If the SLT agency's collocated sampler generates a sampler run log/data file, the file should be backed up to the AirQA website. The following steps describe how an SLT agency uploads the sampler data files to the AirQA website.

1. Access the AirQA website as described in Section 4, hover over "PEPs", and select "Pb-PEP" from the dropdown menu displayed in step 1 of **Figure 4**.
2. In the subsequent screen of options (step 2 of **Figure 4**), click the "Pb-PEP Event Raw Sampler Data Files" icon.
3. In the subsequent screen (step 3 of **Figure 4**), select the folder for the appropriate EPA Region for the monitoring site (A) and click on the upload button (B). A window will pop

up to upload the raw sampler data. The filename for the data file must include the sample date and the Filter ID (e.g., 2018_10_20_G1513240).

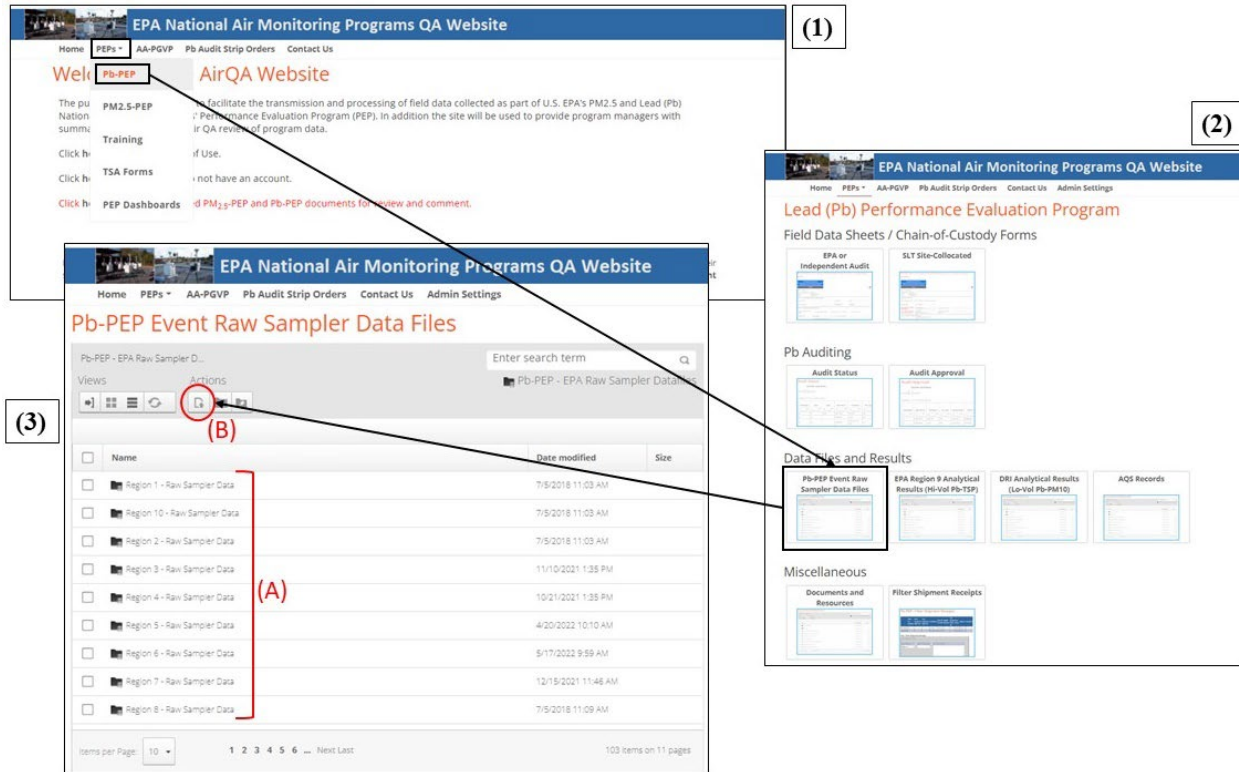


Figure 4. Three-step process to upload Pb-PEP field sampling data to AirQA

5.0 FILTER SHIPPING PROCEDURES

Following a Pb-PEP sampling event, where should the Pb-PEP sample filter be shipped? Short Answer:

The SLT collocated Pb-PEP sample filter is shipped to the Federal independent Pb-PEP laboratory (see text box for address).

Note: SLT agencies are encouraged to use a shipping air bill provided by EPA for shipping Pb-PEP sample filters. Shipping labels may be requested from Dennis Crumpler (crumpler.dennis@epa.gov). The air bill will be e-mailed to the Pb-PEP sample contact(s) identified for the SLT agency. Each year, agencies are encouraged to request labels and confirm appropriate contact information for delivery of the labels with EPA by January 30. EPA plans to

Contact information for the Pb-PEP laboratory

Sample Control:
 USEPA Region 4 LSASD
 Mike Beall/Sample Custody
 980 College Station
 Athens, GA 30605
 Email: R4SampleCustody@epa.gov
 Phone: 706-355-8655

Technical Questions:
 Stacie Masters
 Email: Masters.Stacie@epa.gov
 Phone: 706-355-8847

provide an interactive spreadsheet to store this information on the AirQA website.

Detailed Answer: The SLT collocated Pb-PEP sample filter is shipped to the Federal independent Pb-PEP laboratory (see text box for address), *not* to the analytical laboratory utilized by the SLT agency for analyzing routine Pb samples. Only the Pb-PEP sample filter is shipped to the Federal independent Pb-PEP laboratory. The routine filter from the primary sampler is shipped to the SLT's routine Pb analysis laboratory and data reported to AQS as per the normal processes. SLT agencies may request a portion of the Pb-PEP filter be returned for secondary or additional analysis independent of the Pb-PEP. EPA anticipates that filter material (minimally one 1×8-inch strip) will be available to return to the SLT agency upon request; such requests should be indicated on the electronic COC/FDS. If a rush turnaround on a filter strip is needed, or more than one strip is requested, contact the Federal independent Pb-PEP laboratory.

How should filters be prepared for shipping? Short Answer: Sampled filters should be folded lengthwise with the PM inward, placed in the protective envelope, and packed in the shipping box along with a hardcopy of completed COC/FDS forms. Samples should be shipped to the Federal independent Pb-PEP laboratory by overnight courier within 48 hours of retrieval from the field. Shipments should be scheduled to avoid weekend delivery. SLT agencies should notify the Federal independent Pb-PEP laboratory by e-mail (R4SampleCustody@epa.gov) of a sample shipment being enroute.

Detailed Answer: As described in Section 1.0, filters are to be handled in such a way to prevent damage, contamination, or dislodging of collected PM. Exposed filters should be delivered to the Federal independent Pb-PEP laboratory whole (no strips or portions removed). Other than preparing the filter for shipment by carefully folding it once at the center, filters should not be disturbed or altered once recovered from the sampler. Prepare and ship filters according to the following process:

1. Fold the filter lengthwise with the PM inward and secure it into its own glassine envelope.¹ For lot blanks, TBs, and FBs, fold the filter so the filter ID is on the outside. One or more glassine envelopes can be placed in a large manila envelope overpack. The manila envelope may need to be split lengthwise and on one end to permit the glassine envelope to be inserted and then can be secured by transparent tape. Ensure the filter ID is recorded/displayed on the outside of each manila envelope and package the filters together in the shipping box.
2. Place the hard copy of each COC/FDS, one for each filter, in the shipping box. Several filters can be shipped in the same shipment.
3. Dispatch the filter shipment via air courier to the Federal independent Pb-PEP laboratory within 48 hours of filter retrieval from the sampler(s). Delivery is not time sensitive; however, air courier provides for better tracking. Please avoid shipments with expected delivery on weekend days.

¹ EPA recommends 4.5×11-inch glassine envelopes be used to protect the filter following retrieval. If 4.5×11-inch glassine envelopes are unavailable, 9×11-inch glassine envelopes can be used instead by folding the envelope lengthwise to accommodate the filter. Though glassine envelopes are inexpensive when purchased in large quantities, the National Program lead maintains a supply of glassine envelopes for use in the Pb-PEP if an agency is unable to obtain their own inventory.

4. E-mail the Federal independent Pb-PEP laboratory (R4SampleCustody@epa.gov) to notify that a sample shipment is enroute.

6.0 THE PB-PEP VALIDATION PROCESS

The lifecycle of a Pb-PEP sample record includes multiple automated and manual validation steps. This includes procedures in the field during the Pb-PEP sampling event, in the laboratory during filter extraction/analysis, and during the data flow process involving the AirQA website, the Pb-PEP database, and AQS. The following section describes the validation processes involved in processing Pb-PEP data from AirQA to AQS.

The Audit Approval table on the AirQA website includes an 'Approval Status' column, which indicates the current stage in the validation process of a given Pb-PEP record prior to AQS upload attempt. The four statuses are:

1. **In Progress:** An electronic COC/FDS has been created and saved, and either:
 - a. The four critical criteria in the validation table are not all passing, or
 - b. All critical criteria are passing but the 'Validate Filter and Submit for Approval' button has not been selected.
2. **QC Checked:** An electronic COC/FDS has been created, all critical criteria are passing, and the 'Validate Filter and Submit for Approval' button has been selected.
3. **Approved:** The EPA Regional Lead has reviewed and approved the record. A record can only be approved if:
 - a. The current approval status = 'QC Checked', and
 - b. The field and laboratory records have been successfully paired and a Pb concentration result is available.
4. **Rejected:** The EPA Regional Lead has reviewed and rejected the record. A record can be rejected if:
 - a. The current approval status = 'QC Checked', and
 - b. The field and laboratory records have been successfully paired and a Pb concentration result is available.

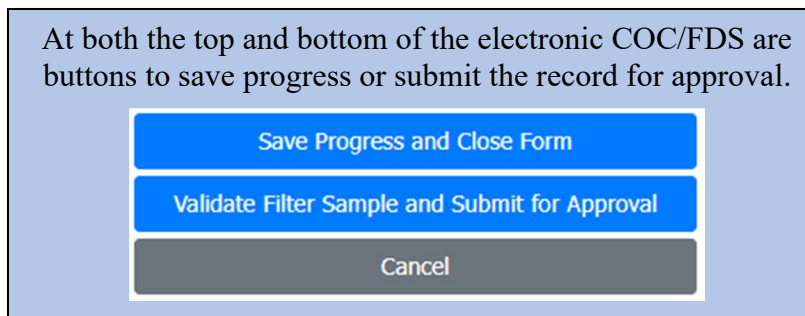
When a new electronic COC/FDS form is created and saved, a new row in AirQA's Audit Approval table is automatically created for this record. The Approval Status at this time will be set to 'In Progress'. There are four critical criteria on the COC/FDS that must be entered and passing before the Approval Status will update from 'In Progress.' Appendix A illustrates the electronic COC/FDS, using call-out boxes to highlight these critical criteria. They include:

1. **Site-Collocated Sampler Last Verification Date:** The SLT site's collocated sampler must have been verified no later than three (3) months before the Pb-PEP sampling event date.
2. **Elapsed Time (hr):** The elapsed sampling time during the Pb-PEP sampling event must be between 24 ± 1 hour ($1,440 \pm 60$ minutes).
3. **Post-sampling Filter Check OK?:** After the completion of the Pb-PEP sampling event, the filter must pass a visual integrity check. Filters should not contain any pinholes,

separation, chaff, loose material, discoloration, or non-uniformity. Any filter failing an integrity check after the Pb-PEP sampling event should not be shipped to the Federal independent Pb-PEP laboratory. Rather, a make-up Pb-PEP sampling event should be scheduled.

4. **Flow Rate (local conditions) Avg:** The average flow rate (in local conditions) of both samplers must be between 1.1-1.7 m³/min (39-60 ft³/min).

Once all four critical criteria are passing, as indicated in the Validation Table at the bottom of the COC/FDS (Figure 5 and Appendix A), the user can select the “Validate Filter Sample and Submit for Approval” button on the COC/FDS form. This button is not selectable if any of the four critical criteria are failing.



After the user selects the validate button, the Approval Status in AirQA’s Audit Approval table will update from ‘In Progress’ to ‘QC Checked’. At any point during which a record’s Approval Status is either ‘In Progress’ or ‘QC Checked’, SLT personnel can provide any necessary changes to data in the electronic COC/FDS. Once the EPA Regional Lead approves or rejects a record (described further below), the COC/FDS is locked and can no longer be edited.

VALIDATION				
(Criteria start out at default values)				
Parameter	Criteria	Value	Pass/Fail	QC Level
Post-sampling Filter Check OK?	Yes	Yes	Pass	Critical Criterion
Elapsed Time (ET)	24 hrs ± 1 hr		Fail	Critical Criterion
Flow Rate (local conditions) - Avg	1.1 - 1.7 m ³ /min (39 - 60 ft ³ /min)	0	Fail	Critical Criterion
Site-Collocated Sampler Last Verification Date	≤ 1 quarter of sample date		Fail	Critical Criterion

Critical: 1 of 4 passed **Op. Eval:** 0 of 0 passed **Total:** 1 of 4 passed

Is data valid for comparison and upload to AQS?
 No Yes

Figure 5. The COC/FDS Validation Table

Note: The Pass/Fail status for each of the four critical criteria is automatically updated as users complete the form. Once all four criteria are passing the ‘Is data valid for comparison and upload to AQS?’ radio button automatically toggles from No to Yes. This radio button is not clickable by the user.

After extracting and analyzing a set of Pb-PEP filters, the Federal independent Pb-PEP laboratory uploads the laboratory results (mass of Pb identified on filter) along with any assigned QC flags to the AirQA website, independent of the associated field data. Some of the laboratory analysis QC and validation checks include:

- Examining the hardcopy COC/FDS for correct and complete entries. If incomplete or errors are noted, the filters are flagged.
- Visually inspecting each filter prior to digesting and analyzing. If pinholes, separation, chaff, loose material, discoloration, or filter non-uniformity is noted, the filter(s) are flagged but still digested, analyzed, and uploaded to AirQA.
- Ensuring the filter number on the filter and that reported on the COC/FDS are the same. Any mislabeled filter is flagged, and field personnel are informed.
- Internal laboratory QC checks must all be passing. Otherwise, a repeat analysis on extracts or second extraction and analysis may be required.

The EPA QA contractor periodically (~bi-monthly) pairs the field record (as created through the electronic COC/FDS) and laboratory record (uploaded separately by the Federal independent Pb-PEP laboratory) for each Pb-PEP sample. Field and laboratory records are paired solely based on matching filter IDs. Later validation steps can invalidate pairs or remove duplicate pairings, which could occur in the event multiple field records contain identical filter IDs. It is critical that the electronic and hardcopy COC/FDS contain no typos and identical filter IDs for a given Pb-PEP sampling event. Laboratory and field records having matching filter IDs will pair regardless of the Approval Status (In Process, QC Checked, Approved, Rejected) in the Audit Approval table. A Pb concentration ($\mu\text{g}/\text{m}^3$) is then calculated from the Pb mass (laboratory record) and total sampler volume (from the field record) and included on the Audit Approval table. At this time (when the Approval Status = 'QC Checked' and a Pb concentration is available), the EPA Regional Lead can either approve or reject records on AirQA, which will update the Approval Status to either 'Approved' or 'Rejected'. During the approval/rejection process, the EPA Regional Lead takes into consideration any Pb-PEP Analytical Laboratory QC flags/notes and field COC/FDS validation results and comments.

Concurrently with field/laboratory records pairing and either before or after EPA Regional Lead approval, the following automated validation checks are performed:

- The total volume reported on the electronic COC/FDS is not null and within the expected range (1518-2550 m^3). The acceptable total volume range is based on both the acceptable elapsed time (24 ± 1 hour) and average flow rate (1.1-1.7 m^3/min) ranges.
- The reported total volume is no more than 4% different than the calculated total volume (based on the reported average flow rate and elapsed time).
- The Pb concentration is not null.
- The AQS Site ID is valid.

The EPA QA contractor internally reviews and performs corrective action where feasible for any records that fail the above validation checks. These records may also be provided to the OAQPS National Pb-PEP Lead and/or EPA Regional Leads for follow-up.

Records undergo an upload attempt to AQS when they both (1) pass the above validation checks and (2) have an Audit Status = ‘Approved’. In a final validation step, AQS will either accept or reject the records. Accepted records are then officially available in AQS (e.g., AMP504 reports). A list of rejected records along with the reason for the failed upload attempt are provided to the OAQPS National Pb-PEP Lead. These records remain housed in the AirQA’s Pb-PEP database until the proper corrective actions are taken, at which point the records can undergo a second upload attempt. The two most common AQS rejections are:

- “*Unique constraint (AIRSRAQS.PEP_UK) violated*”: This indicates a Pb-PEP record with the same AQS site and date already exists in AQS.
- “*Security Violation. You do not have permissions to update this data*”: This indicates that the ‘Insert’ flag likely needs changed to ‘update’.

7.0 STEP-BY-STEP INSTRUCTIONS/CHECKLIST

✓	General Activities
	1. Select sites for SLT collocated Pb-PEP sampling events. The PQAO selects sites for conducting SLT collocated Pb-PEP sampling events in the coming year. Depending on the number of Pb network monitoring sites in the PQAO, an SLT agency is required to perform either four (4) or six (6) SLT collocated Pb-PEP sampling events annually. Priority may be placed on sites with historically higher Pb concentrations.
	2. Schedule SLT collocated Pb-PEP sampling events. SLT agencies coordinate with their site operators to schedule the Pb-PEP sampling events throughout the year, but with some preference to seasons in which the highest Pb concentrations have been exhibited historically.
	3. Obtain filters for Pb-PEP sampling events. SLT agencies request and receive an allotment of GFFs from the OAQPS Pb-PEP Lead. Filters should be requested to cover routine TSP sampling, Pb-PEP sampling events, and field QA samples (i.e., blanks) for the year. <i>Note: QFFs may be permitted under certain circumstances (see Section 3).</i>
	4. Submit a lot blank. Background Pb is determined for each lot of filter media by randomly selecting a GFF from each new box of filters as a filter lot blank and submitting it to the Pb-PEP laboratory (at least annually or when a new box of filters is received).
✓	Activities to Perform During an SLT Collocated Pb-PEP Sampling Event
	1. The sample collector loads a filter into a sampler cassette and transports the sample to the monitoring site. If a FB and TB are also to be collected, the FB is installed into a sampler cassette and sealed in an anti-static bag. The TB is treated likewise but never removed from the sealed antistatic bag until it reaches the Pb-PEP laboratory.
	2. The sample collector prints a blank or partially filled COC/FDS form(s) from AirQA to be completed in the field for each filter (Pb-PEP sample, FB, and TB, as appropriate).

	3. The sample collector notes any siting-related issues that do not comply with applicable regulations for Pb sampling on the COC/FDS even if the EPA Regional Administrator's delegated approver has approved a waiver.
	4. The sample collector records the date of the most recent flow rate calibration verification for the permanently installed collocated sampler on the COC/FDS, if known. <i>Note: The SLT site operator should perform a flow rate calibration on the collocated Pb sampler at least quarterly.</i>
	5. The sample collector collects a TB and FB for 50% of SLT collocated Pb-PEP sampling events and completes each filter's COC/FDS.
	6. The sample collector sets up the primary and collocated samplers per the SLT agency SOP. Such activities include conducting a leak check on the permanently collocated Pb sampler, and, if the sampler does not log the sample flow rate, measuring the starting sample flow. The operator verifies the programmed sample timer collection date and starting and ending times prior to departing the site.
	7. The sample collector installs the assembled sample filter cassette and programs the fixed collocated sampler to sample concurrently with the primary routine Pb sampler (24 ± 1 hours of collection from midnight to midnight).
	8. The samplers run for the 24±1-hour period and collect the primary and SLT collocated Pb-PEP samples.
	9. Concurrently with retrieval of the routine primary sample and preferably within 24 hours of the end of sample collection, the sample collector retrieves the sample filter, documents filter collection details on the COC/FDS form, and downloads the sampler run data file if available.
	10. The sample collector signs the completed COC/FDS form(s) and prepares photocopies or scans of the forms, and archives copies of these forms.
	11. The sample collector enters the sample collection information into the electronic COC/FDS on AirQA and uploads sample data logged files (if sampler is so equipped) from the sampler to AirQA. (Some samplers will not download directly to a laptop or notebook, so a thumb drive may be necessary to store and transfer the data.)
	12. The SLT agency may request a portion of the Pb-PEP filter to be returned following analysis by the Pb-PEP laboratory. SLTs should request filters are returned by selecting the appropriate check box on the COC/FDS.
	13. The sample collector packages and ships the recovered filters with the original COC/FDS to the Pb-PEP laboratory. Upon shipment, the sample collector sends a notification e-mail to the laboratory to alert them of the expected shipment.
	14. The SLT's designated Pb-PEP coordinator can review the approval status of results on AirQA's audit approval page: PEPs dropdown → Pb-PEP → Audit Approval.

Note: Once the SLT agency conducting the collocated Pb-PEP sampling event relinquishes samples to the shipping courier and uploads completed field data to AirQA, the SLT agency has achieved its key responsibilities in the Pb-PEP sampling event (unless further information is needed by EPA Regional Pb-PEP Leads or PQAO Pb-PEP coordinators). Other activities remaining for completion of the Pb-PEP sampling event are responsibilities of the Federal independent Pb-PEP laboratory and EPA Regional staff and include laboratory analysis of the samples, reporting and pairing of analytical results, review of the validation evaluations, and approval or rejection of the sample

APPENDIX A:

Chain of Custody and Field Data Sheet (COC/FDS) for SLT Collocated Pb-PEP Sampling Events (high-volume sampling)

The COC/FDS is illustrated here in six separate parts: the header/sampler information, Parts I through IV of the form, and the Validation table. Note that the electronic form on the AirQA website is provided as a single/continuous document.

Header/Sampler Information:

The screenshot displays the EPA National Air Monitoring Programs QA Website interface. At the top, there is a navigation bar with links for Home, PEPs, AA-PGVP, Pb Audit Strip Orders, Contact Us, and Admin Settings. The main heading is "Pb-PEP Chain-of-Custody and Field Data Sheet for SLT Site-Collocated Samplers". Below the heading are three buttons: "Save Progress and Close Form", "Validate Filter Sample and Submit for Approval", and "Cancel". A legend indicates that "RED" denotes a required field.

User Information: Fields for Display Name, Email, and Phone are present. A callout box notes that user information is auto-populated here.

SAMPLER INFORMATION: This section includes radio buttons for "Hi-Vol (glass-fiber filters)" and "Low-Vol (Teflon filters - historical records only)". A "Sample Type" dropdown menu is set to "RO - Routine". Other fields include "Site-Collocated Sampler Make/Model", "Site-Collocated Sampler", and "Last Verification Date" (marked as required and quarterly per CFR). A callout box explains that selecting the sample type updates the remaining entries and that this should be the first field completed before printing a hardcopy. Another callout box states that selecting the specific sampler type updates the units shown on the form, which is important to do prior to printing a hardcopy.

Submission Instructions: A callout box at the top right explains that users can save progress or validate/submit the form at both the top and bottom, but the validation button is only selectable when all four critical criteria are met.

Critical Criteria: A callout box at the bottom left states: "CRITICAL CRITERIA: The Site-Collocated sampler's last verification date must be entered here and within a quarter (3 months) of the sampling date to pass automated validations."

Part I: Sampling Event Information

PART I - SAMPLING EVENT INFORMATION

Populate using below criteria

NOTE: Only criteria that contain active sites will be available for selection

State:

County/Parish:

Site ID:

OR

Enter manually

AQS Site ID

Site Name

Site Operator

Site Operator Email

Site Operator Phone

Other Operators or Observers

Filter Number (Stamped by Manufacturer)

Select the AQS Site ID by choosing from the State, County, and Site ID dropdowns. Only currently active Pb network sites will be available from the dropdown.

Only enter the site ID manually if the site does not appear in the dropdown option and you are certain the site ID is correct (newly formed Pb network sites may not appear in the dropdown list).

Ensure the electronically entered Filter ID matches exactly with the hardcopy (if handwritten) sent to the Pb-PEP lab. If discrepancies exist, the field and lab data will not be pairable, a concentration will not be calculable, and results will not be uploaded to AQS.

Part II: Sampling Event Filter and Exposure Data

PART II - SAMPLING EVENT FILTER AND EXPOSURE DATA

Time of day is expressed in military time (e.g., 21:00 for 9:00pm).

Sample Date

Start Date/Time

Stop Date/Time

Elapsed Time (hr)

Filter Retrieval Date

Post-sampling Filter Check OK? Yes No

NOTE: Filters failing integrity check after the sampling event should not be shipped. A make-up Pb-PEP sampling event should be scheduled.

Total Volume

Initial Flow Rate* (local conditions)

Final Flow Rate (local conditions)

Flow Rate (local conditions) Max: Min: Avg:

Ambient Temperature (° C) Max: Min: Avg:

Barometric Pressure (mm Hg) Max: Min: Avg:

Sampler Flags: Field Flags:

Requested Analysis: ICPMS Pb (µg/filter, glass or quartz)

Media: Ambient Air

* Initial Flow Rate measurements (if manual) should be taken at least 5 minutes after start up.

CRITICAL CRITERIA: Elapsed time must be entered and within 24±1 hour to pass automated validations.

CRITICAL CRITERIA: Post-sampling filter check must pass (selected 'Yes') to pass automated validations. Note, the 'Yes' radio button is automatically selected on creation of a new COC/FDS.

Total volume and average flow rate must be reported at local conditions. If using a different form and reporting under standard temperature and pressure (STP), you must also provide the average temperature and barometric pressure during the sampling event. Recall that Pb concentrations are reported at local conditions.

CRITICAL CRITERIA: The average flow rate at local conditions must be between 1.1-1.7 m³/min (39-60 ft³/min) to pass automated validations.

Part III: Field Filter Shipping Information

PART III - FIELD FILTER SHIPPING INFORMATION

Ship filters to:
USEPA Region 4 LSASD
Mike Beall/Sample Custody
980 College Station
Athens, GA 30605
Email: R4SampleCustody@epa.gov
Phone: 706-355-8655

Date and Time

Sample Shipment Relinquished

Shipping Agency or PQAO

Shipped Via (if other, please explain)

Do you want a portion of the filter sent back to the PQAO? Yes No

Tracking No.

Comments

Relinquished by (type/print)

Relinquished By (signature) _____

SLT contact person to notify of sample problems
(Click applicable button to auto-populate fields)

Name

Email

Phone

If you would like the Region 4 analytical laboratory to return a portion of the filter, indicate so by selected the 'Yes' radio button. Note, 'No' is automatically selected on creation of a new COC/FDS.

Part IV: National Pb-PEP Laboratory Receiving Information

PART IV - NATIONAL PB-PEP LABORATORY RECEIVING INFORMATION
(To be completed by PEP analysis laboratory)

Integrity Flag (AJ)

Shipment Integrity OK? Yes No

Filter altered prior to shipping

Filter improperly folded

Protective inside envelope is damaged, filter exposed

Damage during shipping, affects entire filter surface or prevents adequate strip to be cut

Laboratory Receipt Comments

Date and Time Sample Received

Received By

Received By (signature) _____

Part IV of the COC/FDS is to be completed by the Pb-PEP analytical laboratory. This section of the form should be left blank by SLT staff in both the (1) electronic version submitted on AirQA and (2) the hardcopy version sent to the laboratory. The lab will complete this section on the hardcopy version and upload a scanned copy to AirQA.

At both the top and bottom (here) of the form, users can save progress or validate/submit the completed form for approval. The validation button is not selectable until each of the four critical criteria are met.

Validation Table:

VALIDATION
(Criteria start out at default values)

Parameter	Criteria	Value	Pass/Fail	QC Level
Post-sampling Filter Check OK?	Yes	Yes	Pass	Critical Criterion
Elapsed Time (ET)	24 hrs ± 1 hr		Fail	Critical Criterion
Flow Rate (local conditions) - Avg	1.1 - 1.7 m ³ /min (39 - 60 ft ³ /min)	0	Fail	Critical Criterion
Site-Collocated Sampler Last Verification Date	≤ 1 quarter of sample date		Fail	Critical Criterion

Critical: 1 of 4 passed Op. Eval: 0 of 0 passed Total: 1 of 4 passed

Is data valid for comparison and upload to AQS?
 No Yes

The four critical criteria of the COC/FDS are automatically set to Pass or Fail in the Validation table based on user inputs in Parts I and II of the form.

The 'Is data valid for comparison and upload to AQS?' radio buttons are automatically toggled (users are not able to select between No/Yes). If all four criteria in the table are passing, the 'Yes' radio button is selected. Otherwise, 'No' is selected.

Note, the EPA Regional Lead can only approve or reject a record in which the 'Yes' radio button is toggled, i.e., the Audit Status = 'QC Checked', and the field record is paired with a lab record.