

CHATTANOOGA- HAMILTON COUNTY QUALITY MANAGEMENT PLAN

2019 Version 9

June 11, 2019

Chattanooga-Hamilton County initially adopted the State of Tennessee's November 1, 2006, EPA approved QMP with a letter dated November 10, 2006, detailing the differences between the two programs. The Bureau adopted the State's QMP of September 1, 2011, for the EPA approved QMP submission of November 29, 2012. Chattanooga-Hamilton is its own PQAQ.

Kathy Jones
Air Monitoring Manager

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1. APPROVALS

**Chattanooga-Hamilton County Air Pollution Control Bureau
Quality Management Plan 2019**

Signature:  Date: 6/11/19
Kathy Jones, Air Monitoring Manager

Signature:  Date: 6-11-19
Robert H. Colby, Director

U.S. EPA, Region 4

Signature:  Date: 6/12/19
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2. GLOSSARY OF TERMS

AERR-Air Emissions Reporting Requirements-*40 CFR Part 51 subpart A*: regulatory requirements for reporting emissions data to the EIS

AMM- Air Monitoring Manager

Audit- measure of the overall agreement of a measurement to a known value

Auditing device-NIST traceable pressure standard, flow standard, or temperature standard (or a combination)-certified yearly- used to provide the actual pressure, flow, and temperature in an audit.

CAPS-Critical Air Pollutants

CDX-Central Data Exchange-mechanism to load data to the EIS

Certificate of Exemption-Document that exempts the local agency from State regulatory authority

CMS- Compliance Monitoring Strategy- document submitted to EPA every two years

Criteria Pollutants- Pollutants for which there are National Ambient Air Quality Standards

DAS-Data Acquisition System

DQO- Data Quality Objectives

EE- Exceptional pollution events

EPA-Environmental Protection Agency

EIS-Emission Inventory System where data is collected to submit to the NEI

EIT-Engineer in Training

EM- Engineering Manager

Exceptional Events- Data for which event flags and explanation are added to AQS

FEM-Federal Equivalent Method- type of formal EPA approval detailed in *40 CFR*

FRM-Federal Reference Method-type of formal EPA approval detailed in *40 CFR*

HAPS-Hazardous Air Pollutants

HR- Human Resources

“I” series data flags-Flags for data in AQS that indicate the agency recognizes a pollution event occurred but does not plan to request formal exceptional event status from EPA

IML-Inter-Mountain Laboratories of Sheridan, Wyoming

LSASD-EPA’s Laboratory Services and Applied Science Division in Athens, Georgia

MOA- Memorandum of Agreement with the State of Georgia

NAAQS-National Ambient Air Quality Standards

NEI-National Emissions Inventory

NESHAP-National Emissions Standards for Hazardous Air Pollutants

NOV-Notice of Violation

Null Value Codes-Explanatory codes placed in AQS for missing data

OM-Operations Manager

PDH-Professional Development Hours

PE- Professional Engineer’s License

Precision- a measure of agreement among repeated measurements of the same property under identical, or substantially similar, conditions.

PM_{2.5}-Particulate Matter 2.5 microns or less

PM₁₀-Particulate Matter 10 microns or less.

PQAO-Primary Quality Assurance Organization

“R” series data flags-Flags for data in AQS that indicate the agency will formally request exceptional event status from EPA

Region 4-Group of southeastern states termed Region 4 by EPA: Tennessee,

Kentucky, North Carolina, South Carolina, Mississippi, Alabama, Georgia, and Florida. EPA Region 4 is headquartered in Atlanta.

SCC-Source Classification Code from EPA's published list of codes

TEOM-Thermo Environmental, Inc., Tapered Element Oscillating Microbalance

T640- Teledyne continuous PM_{2.5} (FEM) and PM₁₀ monitor, light scattering method. Not FEM for PM₁₀.

The Bureau- The Chattanooga-Hamilton County Air Pollution Control Bureau

TSA-EPA Technical Systems Audit

VAAP-Volunteer Army Ammunition Plant

3. INTRODUCTION

3.1. History

John Ross, a renowned Cherokee Chief, began a ferry service and a warehouse along the Tennessee River at a location known as Ross's Landing in 1817. From the settlement around Ross's Landing came the City of Chattanooga, established in 1838. The city became a railroad town, a major hub between the northern and southern states, which resulted in Civil War battles for control of the city. After the Civil War, industries were attracted to the natural resources in the area and the transportation convenience of the Tennessee River. When the Tennessee Valley Authority was created under President Franklin D. Roosevelt, dams provided inexpensive hydroelectric power for foundries, chemical plants, and numerous other industries.

The Volunteer Army Ammunition Plant (VAAP), northeast of downtown on roughly 7,000 acres, operated in Hamilton County as a TNT (trinitrotoluene) manufacturing facility from 1942 to 1977 and housed a fertilizer production facility from 1962 to 1982. The original facility was built to support World War II and was put on standby status from 1946-1952. VAAP was reactivated for the Korean War, placed on standby status again from 1957-1965, then was reactivated for the Vietnam War. Nitric acid and sulfuric acid plants operated as part of the facilities. In 1966 a new acid plant was built. In 1970 the Army built a New Acid Area which included a Direct Strong Nitric Acid Facility, an Ammonia Oxidation Process Nitric Acid Facility, and Sulfuric Acid Regeneration facilities used for oleum production. In 1972 a carbon dioxide plant and an industrial wastewater facility for treating and recycling ammonium wastewater were constructed. By 1975 all batch process lines stopped, and in 1977 TNT production at VAAP ceased. Commercial ammonium nitrate was produced at the plant until 1982. (VAAP history from *Enterprise South Industrial Park*, Wikipedia) The acid plants at VAAP were a local source of nitrogen oxides, precursors for ozone, and sulfur dioxide, a component of particulate.

By 1974, Chattanooga was given a per capita ranking of eighth in the nation for industry. As industry grew, so did air pollution.

In 1924 local government passed a Boiler Inspection/Smoke Control Ordinance that progressed toward controlling smoke until the industrial demands of World War II interrupted the efforts. Pictures of Chattanooga from that era show volumes of black sooty smoke from buildings and factories. By the mid-1940s dust fallout from the railroad industry became a new pollution problem resulting in smoke reduction devices being installed on locomotives. In 1951 a Bureau of Smoke Abatement was established to have some control over all sources of air pollution. Many different sources were contributing to local air pollution.

A United States Public Health survey showed that from 1957-1961 Chattanooga was the third worst in the nation for particulate pollution. By 1963 Hamilton County had a mortality rate from tuberculosis of three (3) times the national average and double the state rate. By January 1969 a Health, Education, and Welfare (HEW) report ranked Chattanooga as the worst polluted city in the United States.

After the Federal Clean Air Act was adopted in 1965, Chattanooga-Hamilton County Regulations were passed in 1969 by both the City of Chattanooga and Hamilton County, then by the local municipalities. The regulations created a Board of ten unpaid citizens appointed by the Mayor and the County Executive, including a representative of the Chattanooga-Hamilton County Health Department. The new law required a permit for open burning, placed regulations on odors and dust, outlawed visible automotive emissions, set a four percent cap on sulfur content in fuel, and controlled the production of sulfur oxides. Limits were set on industries' visible emissions. October 14, 1972, was set as the deadline for all existing major sources of pollution to meet a specified opacity level of smoke emissions. More stringent levels were scheduled to be met by 1974. Industries rallied behind the effort. Every major pollution source met the 1972 compliance deadline at a cost of about \$40 million in 1972 dollars. Because the air pollution cleanup was dramatic, national recognition followed in the form of awards and articles in major media outlets.

In 1984 Hamilton County was named "attainment" by the Environmental Protection Agency for particulate levels because levels dropped below the primary standard for the fourth straight year. The declaration that ozone, the principal component in smog, levels had come into "attainment" by meeting the national one-hour ozone standard was made December 13, 1989.

Hamilton County has since met more stringent PM_{2.5} (particulate matter 2.5 microns or less) and 8-hour averaged ozone standards adopted by EPA in the last 15 years. Nearby coal-fired power plants have added pollution control equipment to comply with power plant emission regulations. Local plant closings, pollution prevention measures, installation of better pollution control devices, and the construction of more modern facilities contributed to improved local pollution.

In 2004 Hamilton County adopted aggressive pollution reduction measures as part of participation in an Early Action Compact for ozone reduction. The pollution reduction measures were: (1) a State of Tennessee-operated vehicle emissions testing program, (2) a Stage I Vapor Recovery permitting program, (3) an outdoor burning ban from May 1-September 30, (4) a school bus retrofit program, (5) TDOT lowered speed limits for commercial trucks on all limited access divided highways in the county to 55 mph, and (6) a more aggressive pollution awareness program. Monitoring data indicate that these programs have been very successful in contributing to lowered pollution levels.

Particulate and ozone monitoring data indicate that the air currently is the cleanest it has been since air monitoring for particulate and ozone began in Hamilton County. (Credit to *A History of Air Pollution Control in Chattanooga and Hamilton County* last updated in 1999 and the film *Air Pollution: What One City Did* created by WTCI Educational Television).

3.2. Benefits of the Quality Management System

The Chattanooga-Hamilton County Air Pollution Control Bureau (the Bureau) is not responsible for any other program for Hamilton County besides Air Pollution. This Quality Management Plan (QMP) does not address any other environmental topics besides Air Pollution.

The Bureau generates two sets of critical data used for air pollution control and regulatory purposes: environmental air monitoring data and emissions inventory data. The Bureau's Quality Management Plan protects the integrity and completeness of this data. If Quality Management is detailed in a document, employees can be aware of the Bureau's quality procedures, and there can be some standardization of those procedures.

The ultimate benefit of a Quality Management System is to protect and preserve human health. For this goal, both air monitoring data and emissions data must be as accurate as possible. Data quality assurance is essential to accurately assessing air quality and determining pollution reductions to meet the National Ambient Air Quality Standards. (NAAQS). Excellent air quality positively impacts the economics of the region by attracting new industries.

Optimizing data quality can have a positive health impact for the residents of Hamilton County. The public relies upon the accuracy of the data since those with compromised health, especially heart and lung health, must make daily decisions that affect their health.

4. MANAGEMENT AND ORGANIZATION

4.1. Departments and Programs

There are three Bureau departments that have quality assurance procedures as part of the departmental functions- Operations, Air Monitoring, and Engineering. Each department is functionally different with its own unique quality assurance procedures. This QMP addresses the unique procedures in each department.

In addition, there are five permitting programs at the Bureau: a Burning Permit Program, a Stage I Vapor Recovery Permitting Program, a Drycleaner Permitting Program, an Asbestos NESHAP Permitting Program, and a Facility Permitting Program (Engineering Department).

The Bureau does not have an independent Quality Assurance Department as do larger agencies. There are no technical personnel solely assigned to perform independent internal quality reviews of Bureau departments nor are there quality assurance workgroups. The agency is too small to support the additional personnel.

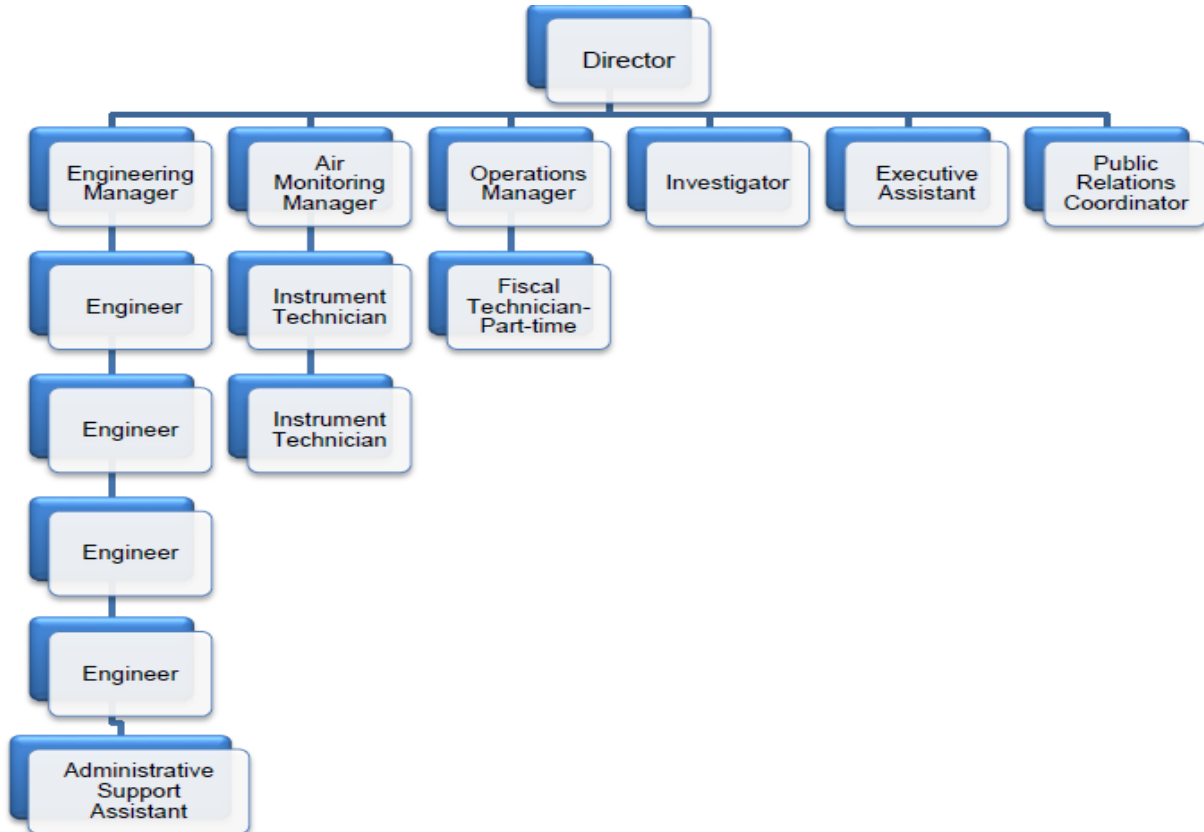
4.2. Organizational Structure

The Chattanooga-Hamilton County Air Pollution Control Bureau is a local air pollution agency operated jointly by the City of Chattanooga and Hamilton County. The Air Pollution Control Board, composed of private citizens appointed by the City and County Mayors, supervises a Director. The Operations Manager supervises an Administrative Coordinator. The Air Monitoring Manager supervises a staff of two Technicians and reports to the Director. The

contract lab, Inter-Mountain Laboratories of Sheridan, Wyoming, reports to the Air Monitoring Manager. An Engineering Manager with a staff of four Engineers and one Administrative Support Assistant also reports to the Director.

A Public Relations Specialist, an Investigator, and an Executive Assistant report directly to the Director. There are currently 14 full-time employees and one (1) part-time.

Organizational Chart: Figure 1



Even though the Bureau is a City-County agency, the City of Chattanooga acts as the fiscal agent of the Bureau. The Bureau purchases through the City Purchasing Department, utilizes the services of the City Information Technology (IT) Department, uses the City garage for vehicle maintenance, and hires through the City Personnel Department. Payroll is administered through the City Payroll Department. Bureau personnel policies are those of the City. The Bureau has an independent retirement program.

The Chattanooga-Hamilton County Air Pollution Control Bureau is charged with promulgating Air Pollution Control Ordinance regulations in Chattanooga, Hamilton County, and the included municipalities of East Ridge, Red Bank, Soddy-Daisy, Signal Mountain, Lookout Mountain, Collegedale, Lakesite, Ridgeside, and Walden (hereafter referenced as the Municipalities). Changes in the Air Pollution Control Ordinance must be approved by the government of each municipality as well as the City of Chattanooga and Hamilton County.

5. QUALITY ASSURANCE RESPONSIBILITIES

Since the Bureau has no QA Department to act as the responsible party for all Bureau Quality Assurance, the individual department managers are responsible for QA in their departments. The Operations, Air Monitoring, and Engineering Departments are highly specialized; therefore, employees of a department are not thoroughly familiar with the regulations or requirements of another department. The Director is ultimately responsible for managing the managers: therefore, the Director is the final quality assurance authority. Quality assurance decisions are made on the department level, but, in the event of a significant quality issue or crisis, the issue would be presented to the Director and he or she would make the final decision.

The Director is responsible for any Quality Assurance activities of the three non-management employees that report to him: the Investigator, the Executive Assistant, and the Public Relations Specialist.

The parties responsible for Quality Assurance in each department or permitting program and the applicable regulations are detailed in Figure 2.

Table of QA Responsible Parties and Applicable Regulations: Figure 2

QA Responsible Party		*Regulations
Departments		
Operations	Operations Manager	City Ordinance, General Services Administration (GSA) for travel reimbursement and mileage
Air Monitoring	Air Monitoring Manager	40 CFR 50, 58
Engineering	Engineering Manager	40 CFR 50-99
Employees not in a dept. or program		
Executive Assistant, Public Relations Specialist	Director	Local Ordinance
Permitting Programs		
Outdoor Burning	Investigator/Director	Local Ordinance
Stage I Vapor Recovery	Engineer/Engineering Mgr.	40 CFR 63 subpart 6C Local Ordinance
Dry Cleaner Inspection Program	Engineer/Engineering Mgr.	40 CFR 60 subpart 3J NESHAP: 40 CFR 63 subpart M, Local Ordinance
Asbestos	Investigator/Director	NESHAP: 40 CFR 61 subpart M, Local Ordinance
*Federal rules specified are adopted identically in Local Ordinances in the City, County, and nine included municipalities.		

5.1. Operations Manager Quality Assurance Responsibilities

The Operations Manager functions as the Quality Assurance Manager for the Operations Department. This department manages the operation of the Bureau defined as anything personnel, insurance, vehicle fleet, or physical facility related. The Operations Manager does not perform QA functions unrelated to those activities.

The Operations Manager functions as the Human Resources Manager for the Bureau. Even though the Bureau utilizes the City of Chattanooga Human Resources Department, there are still human resource responsibilities locally at the Bureau.

The Operations Manager is responsible for:

- Supervising the Administrative Coordinator
- Personnel responsibilities including hiring and separation paperwork
- Bureau Pension administration
- Workman's Compensation administration
- Bureau vehicle acquisition
- Vehicle maintenance and repairs
- Fleet management- purchase of new vehicles
- Risk management: vehicle, employee, and facility insurance policies
- Payroll calculations including holidays, military, and personal leave
- Federal grants and grant requirement tracking
- Preparation of budgets and budget tracking
- Purchasing
- Facility management
- Permit fees, fee tracking, and collections
- Official inventory of Bureau equipment and furniture
- Safety (functions as Safety Officer)

Preparing and tracking the budget are complicated as there are at least four budget years for the Bureau. Some items are on the calendar year. The City of Chattanooga budget year is July 1-June 30. The Federal Grant year is October 1-September 30. The PM_{2.5} grant is not on any budget year since it is from April 1-March 31 and can be written for multiple years. Occasionally there are supplemental grants offered that are not on any budget schedule. The supplement may require a previously submitted grant to be rewritten and resubmitted outside of the normal submission deadlines.

Federal regulations do not allow the City and County to reduce their contributions to the Bureau. The Operations Department adjusts projected Bureau budgets to the actual funds received.

The Quality Assurance procedure for the budget is that the budget is prepared by the Administrative Coordinator after discussions with the Director, then it is reviewed by the Operations Manager, the Director, and approved by the Air Pollution Control Board. The Director gives a financial presentation at every Air Pollution Control Board meeting comparing expenditures to the budget. Since the Bureau is a City-County agency with budget contributions from both entities, operating budgets have to be approved by the City Council

and the Hamilton County Commission. EPA also approves the budget as EPA must confirm that the City and County have made their contributions.

Civil penalties received by the Bureau are divided in proportion to the respective contributions of the City and County and distributed to them. This prevents the Bureau from directly benefiting from civil penalties.

Required Federal Grant reports are essential functions of the Quality Assurance procedures. These grant reports are an accounting to EPA of how the grant money was used or is projected to be used and whether quality assurance procedures requested by EPA have been or are being met. Every department has required grant reports or a portion of a grant report to complete each year. The Operations Manager and the Administrative Support Assistant are responsible for ensuring the required grant reports are completed by the appropriate departments and submitted to EPA. The Administrative Support Assistant retains copies of required grant reports in a notebook for that Federal grant year.

The Administrative Coordinator, or a Director designee, is responsible for purchasing responsibilities for the Bureau. The Coordinator is also responsible for fee tracking and collections, budget preparation and tracking, spending projections, and bill payments.

The Operations Manager maintains the Bureau inventory for insurances purposes. When a significant item is purchased, the Operations Manager is notified when the item arrives so the item can be placed in inventory. A City inventory sticker is placed on the item. The Operations Manager also arranges with the City for the disposition of surplus equipment.

The Operations Manager is notified when a vehicle needs service. Employees take the vehicle to the City garage, and the garage calls with a quote for repairs. The Director must approve for the work to be done before the garage proceeds with the work.

5.2. Air Monitoring Manager Quality Assurance Responsibilities

The Air Monitoring Manager functions as the Quality Assurance Manager for air monitoring and air monitoring data. This manager is responsible for all quality assurance procedures and activities for Bureau-generated air monitoring data.

The data to be quality assured is from Hamilton County air monitoring sites only. The State of Georgia operates a site (132950002) in the Bureau's PM_{2.5} designation area in North Walker County on Maple Street, but Hamilton County has no responsibility for the data from that site.

The Air Monitoring Manager is responsible for writing the PM_{2.5} 103 Grant with assistance from the Operations Manager but is not responsible for Quality Assurance for any other function in the Operations Department. The Air Monitoring Manager has no Quality Assurance responsibilities for the Engineering Department.

The Air Monitoring Manager is responsible for evaluating data for quality, meeting Federal data completion requirements, and quarterly data submittals to AQS to meet the regulatory submittal requirements. The Manager notifies the Director yearly that the data are ready to be certified

for the previous year. These are the most important quality functions of this department as the amount and quality of the data are integral to the EPA designation. The designation affects the economic growth of Hamilton County.

All Quality Assurance Air Monitoring activities, therefore, are directed toward the goal to produce a complete or near complete set of high quality data to compare against the National Ambient Air Quality Standards.

The Air Monitoring Manager prepares the Network Review, the QMP, the Air Monitoring QAPP, the 5-Year Assessment, and SOPs (with assistance from Air Monitoring Technicians). They are stored on the Air Monitoring Manager's computer and on a flash drive in the Bureau laboratory. Paper copies of approved SOPs are in a notebook on the lab bookcase.

This manager:

- Supervises two Air Monitoring Technicians
- Educates Air Monitoring Technicians about data quality
- Prepares and revises the Quality Management Plan (QMP) for monitoring data
- Prepares and revises the 5-Year Assessment
- Submits the Network Review to the State yearly (includes equipment evaluation and sites' evaluation) about April 1 for inclusion in the State Air Monitoring Plan
- Ensures the QAPP and SOPs are written, revised, and implemented as required
- Ensures that environmental data are precise and accurate
- Ensures that data are reviewed according to quality assurance procedures defined in the Bureau EPA approved QAPP and the Bureau EPA approved SOP for Data Handling
- Ensures that data is submitted by regulatory deadlines to AQS
- Writes quality assurance programs into grants where appropriate
- Responds to quality assurance needs
- Conducts performance audits of ozone monitors quarterly and particulate monitors when necessary
- Reviews state audit reports for consistency, comparability, and completeness
- Supervises corrective actions for data loss
- Utilizes training programs when finances permit
- Attends EPA training and conferences about quality assurance or AQS
- Follows, researches, and documents exceptional pollution events
- Flags and documents exceptional pollution events in AQS
- Prepares Bureau exceptional event requests for submission to EPA, if necessary

5.2.1. Inter-Mountain Laboratories

Chattanooga-Hamilton County has contracted with Inter-Mountain Laboratories (IML) of Sheridan, Wyoming, for PM_{2.5} filter weighing since before the official beginning of the PM_{2.5} program on January 1, 1999. IML has its own *Quality Assurance Project Plan for Laboratory and Data Management Support of the Determination of Fine Particulate Matter as PM_{2.5} and Coarse Particulate Matter as PM_{10-2.5} in the Atmosphere (Current version: March, 2017, Revision 14)*. The Air Monitoring Manager is responsible for writing the contract specifications

and reviewing the lab QAPP to ensure the laboratory work meets *40 CFR Part 50 Appendix L* and the QA requirements in 2.12. The five-year contract is reviewed and renewed yearly.

IML is licensed, accredited, or certified in ten states for different types of laboratory analytical work including soil and water analysis. However, only in Louisiana and Texas do the state accreditations apply to PM_{2.5} through the National Environmental Laboratory Accreditation Program (NELAP). IML is also certified by the USEPA for specific analytical work; holds materials licenses from the NRC (Nuclear Regulatory Commission) to receive, acquire, and possess byproduct source and special nuclear material; and holds a permit for soil receipt by the US Department of Agriculture (USDA).

IML is one of the few contract companies in the US that performs gravimetric weighing of thousands of PM₁₀ and PM_{2.5} filters a year for air monitoring agencies. The IML gravimetric laboratory was audited by EPA's Laboratory Services and Applied Science Division in 2014. There were no major findings.

Discussions about field or laboratory work normally are conducted between the Air Monitoring Manager and the IML Laboratory Supervisor. The Air Monitoring Manager reviews the IML QAPP. The Air Monitoring Manager reads the raw data reports quarterly and reviews the AMP reports from AQS after data is loaded. Preliminary data are requested from IML during the quarter if there are concerns about specific data. Data returned from IML in AQS loadable format are not considered "final" data.

Data are reviewed after receipt from IML, and AMP reports are reviewed for reasonability after data is entered into AQS. Data can be removed from the data set after receipt from IML and before loading to AQS. IML-produced data can also be removed from AQS after loading and before certification.

IML preconditions and preweighs filters and loads filters into cassettes for the low volume Federal Reference Thermo Environmental (R & P) PM_{2.5} Federal Reference Monitors. IML mails the filter-loaded cassettes to the Bureau for exposure. Bureau Air Monitoring Technicians load the cassettes into the monitors, then collect exposed filters, and mail them to IML to be removed from the cassettes. The filters are then reconditioned and reweighed. The Bureau has a mailing schedule in order to prevent filter preweight expiration.

The Bureau Air Monitoring Department once maintained a laboratory for PM₁₀ weighing. The Bureau petitioned EPA to delete the collocated PM₁₀ monitoring site in 2014 which was concurred. The high volume method collocated PM₁₀ site was decommissioned in January of 2015. No FRM or FEM PM₁₀ monitoring is performed by Hamilton County, and no PM₁₀ filter weighing is performed in the Bureau laboratory. The Bureau does monitor continuous PM₁₀ with a Teledyne T640, but the method is not Federal Reference or Federal Equivalent.

5.3. Engineering Manager Quality Assurance Responsibilities

The Engineering Manager or his Engineering designee functions as the Quality Assurance Manager for the Engineering Department. This manager has no responsibility for Quality Assurance functions in the Air Monitoring or Operations Departments.

This Manager

- Supervises four Engineers and the Administrative Support Assistant
- Updates the Emissions Inventory Quality Control Project Plan every 5 years
- Assigns new applications to a permitting engineer
- Reviews permits prepared by the assigned permitting engineer
- Thoroughly reviews the NEI database every 3 years. In 2017 all emissions data was reviewed by facility
- Revises emissions data as needed
- Submits data to the NEI database
- Currently has engineering duties of permitting and inspection in conjunction with management duties
- Investigates complaints about facilities in cooperation with the Bureau Investigator

Permitting Procedure

An industrial source applies for an installation permit:

- The permit application is received and assigned to the permitting Engineer
- The application is reviewed and the installation permit is developed
- The permit is reviewed by the Engineering Manager and the Director
- The Installation Permit is issued
- The source is inspected and the operating permit is issued
- The permit data is entered into a current database
- The database is archived at year end.
- The 2008 NEI database information is reviewed
- The emissions data is reviewed by comparing data from like industries, reviewing historical emissions, and verifying geographic coordinates
- The designated stationary source emissions are transferred to the NEI every three years, most recently in 2017

Facilities having sources of air pollutant emissions required to be permitted by the Ordinance are classified in the Bureau Emissions Inventory as true minor, synthetic minor, or major, as defined in the Ordinance. A facility must apply for an installation permit. The Bureau issues the permit for emissions sources that require a permit prior to the construction or modification of such source. The facility must apply for an initial certificate of operation, valid for up to the first year of operation. It is issued by the Bureau for a new or newly modified emissions source at any facility that is categorized as true minor or synthetic minor before such a source can be operated. A Part 70 (Title V) permit is issued by the Bureau for the operation of emission sources at any facility identified as major. Certificates of operation and Part 70 permits are renewed as necessary.

Initial emissions information for a facility entered into the Bureau Emissions Inventory is obtained from an installation permit application package that is submitted by the facility. This package includes supplemental permitting forms that specify data such as release point parameters, control equipment efficiencies, and potential air pollutant emission estimates. Bureau Engineering Department permitting personnel evaluate this information in order to write a detailed report that discusses the proposed installation or modification, the resulting air

pollutant emissions, and applicable local and federal regulations. This installation permit report also includes recommendations to the Bureau Director regarding both installation permit issuance and specific air pollutant emission limitations, as applicable. Furthermore, an initial inspection of process equipment and any associated control equipment of a new or newly modified emissions source is conducted by permitting personnel prior to issuance of an initial certificate of operation for the source in order to verify that equipment was installed or modified in accordance with the installation permit application package.

Bureau permitting personnel strive to perform an inspection and full compliance evaluation of each assigned permitted facility on an annual basis. The purpose of the inspections is to observe the condition and operation of process and control equipment of air pollutant emission sources in order to determine if the equipment continues to be configured and operated as required by the conditions of either applicable certificates of operation or a Part 70 permit. Release points are also observed to quantify the opacity of visible emissions, if warranted, and pertinent operating parameters are recorded. The evaluations include reviews of both onsite records and periodic compliance reports submitted by the facility, as applicable. Typical information in these records and reports are material receipts, fuel usages, operating hours, control equipment operating parameters, material-balance calculations of air pollutant emissions, continuous emission monitoring results, and deviations from required operating parameters. The results of each facility inspection and associated evaluation are presented in a written report that also includes discussions of equipment operation, current and potential air pollutant emissions, and applicable regulations. Relevant information, including emissions data, from the inspection and evaluation findings is then updated into the Bureau Emissions Inventory.

The permitting process functions to continually improve the quality and accuracy of data in the Bureau Emissions Inventory. Physical inspections of process equipment, control equipment, and release points expands understanding of operations and reveals any changes since previous inspections. Bureau permitting personnel examine permitted facilities' onsite records, permitting forms, and compliance reports for correctness and consistency

5.3.1. Emissions Inventory

The Bureau Emissions Inventory serves as an indispensable depository of data regarding all facilities that are permitted by the Bureau. This data includes contact information, geographic coordinates, compliance dates, and applicable North American Industry Classification System (NAICS) codes at the "company" level; hourly and annual pollutant emission rates and permit or certificate fee information at the "certificates" level; and release point parameters, operating hours, and appropriate Source Classification Codes (SCC) at the "process components" level.

The Air Emissions Reporting Requirements (AERR) rule (*Title 40 Code of Federal Regulations Part 51, Subpart A*) specifies the requirements for air agencies to report air pollutant emissions data to the EIS. This rule was originally promulgated on December 17, 2008, and it was revised on February 19, 2015.

Facility and release point information for the EIS is entered and updated electronically by way of the EIS Gateway website, and air pollutant emissions data is submitted to the EIS electronically through the Central Data Exchange (CDX).

5.3.2. Investigations

The Bureau employs a staff investigator that investigates pollution complaints. He or she is available 24 hours a day for complaint response to facility pollution releases, improper burning investigations, or asbestos issues. He determines the cause of the complaint, contacts the facility if it is a manufacturing issue, determines if the issue is remedied or on-going, and recommends a Warning Notice of Violation or a Notice of Violation to the Director, if needed. He discusses complaints with the Engineering Manager and the Director. He prepares a complaint report and details the response to the complainant. The complaint reports are reviewed by the Director.

5.3.3. Quality Assurance Responsibilities for Permitting Programs

5.3.3.1. Quality Assurance Responsibilities for Outdoor Burning Program

The Bureau Investigator functions as the responsible employee for Quality Assurance for the Burning Permit Program. The Investigator reports to the Director. The Investigator:

- Enforces the burning ban in Hamilton County from May 1 through September 30
- Inspects all burn sites in the City of Chattanooga to ensure only appropriate materials are to be burned or are being burned.
- Contacts appropriate state or federal agencies if other agencies need to be involved in an investigation
- Inspects Hamilton County and Municipality burn sites as needed
- Responds to burning complaints 24 hours a day
- Recommends enforcement action to the Director for noncompliance

Collection of fee prepayment is the responsibility of the Administrative Support Assistant. Fees may also be accepted by the Executive Assistant, the Administrative Coordinator, or the Public Relations Specialist, who substitute for the Administrative Support Assistant in her absence. The permit application and fee are presented in person or mailed.

5.3.3.2. Quality Assurance Responsibilities for the Stage I Gasoline Vapor Recovery Program

An Engineer or a Director designee functions as the responsible employee for Quality Assurance for the Stage I Gasoline Vapor Recovery Program. Section 4-41, Rule 25.10 of the Chattanooga Air Pollution Control Ordinance, also adopted by Hamilton County and the local Municipalities, requires compliance with Stage I Vapor Recovery. The Engineer recommends permit issuance after a compliance inspection.

The Engineer or a Director designee:

- Ensures that the station has the required vapor recovery equipment
- Ensures that the equipment is functioning properly and is being utilized
- Requests corrective action if the equipment is not installed or is functioning improperly
- Ensures that new stations contact the Bureau and obtain their permit
- Recommends enforcement action to the Director for noncompliance

5.3.3.3. Quality Assurance Responsibilities for the Dry Cleaner Inspection Program

An Engineer functions as the responsible employee for Quality Assurance for the Dry Cleaner Inspection Program for dry cleaners that use perchloroethylene as a solvent. The dry cleaning facilities are subject to the provisions of the *National Perchloroethylene Air Emissions Standards for Dry Cleaning Facilities, 40 CFR Part 63 Subpart M* as adopted in rule 16.6 (3) of the Chattanooga Air Pollution Ordinance, also adopted by Hamilton County and the local Municipalities. The Engineer recommends permit issuance after a compliance inspection. The Engineer:

- Inspects the Dry Cleaner records for compliance with required record keeping
- Inspects for properly functioning equipment
- Determines the amount of perchloroethylene used for the year to determine if there has been a significant change in usage
- Functions as the communication conduit for the Bureau in relation to perchloroethylene usage
- Requests corrective actions by the Dry Cleaner owner for noncompliance
- Recommends enforcement action to the Director for noncompliance

5.3.3.4. Quality Assurance Responsibilities for Asbestos NESHAP

The Bureau Investigator functions as the responsible employee for Quality Assurance for the Asbestos Renovation and Demolition Permitting Program under the National Emission Standards for Hazardous Air Pollutants (NESHAP). The Investigator:

- Receives phone calls or faxes from building permit renovation and demolition applicants from the City of Chattanooga, Hamilton County, or the Municipalities
- Provides information about the Bureau NESHAP permitting process
- Notifies the City of Chattanooga, Hamilton County, or the Municipality if a permit is required from Air Pollution Control
- Reviews applications for renovation and demolition permits for accuracy and completeness
- Reviews asbestos surveys for accuracy and completeness
- Reviews accreditations of asbestos inspectors and abatement workers
- Prepares asbestos permits
- Inspects at least 25% of projects before or during the project
- Recommends enforcement action to the Director for noncompliance

6. QUALITY ASSURANCE SYSTEM COMPONENTS

Figure 3 identifies types of audits, the performing agency, the schedule, the preparer, and the recipients of the audit report.

Table of Audits Reports, Preparers, and Recipients: Figure 3

Report	Performed by	Schedule	Preparer	Recipient
Operations Department				
Financial Audit	Contract Accounting Firm (3 rd Party)	Yearly	Accounting Firm	City of Chattanooga, Operations Manager (OM), Director
Air Monitoring Department				
Network Review <i>Entire Network</i>	Air Monitoring Manager (AMM)	Yearly	Air Monitoring Manager (AMM)	State of TN for the Air Monitoring Plan due July 1
Precision/Span/ for Ozone <i>PM_{2.5} Flow Cks</i>	Automated by Airvision software/ Technicians	Prec: 3 Day Span: 6 Day Flow Cks: Monthly	Techs & AMM prepare & load files into AQS	AQS: Data retrieved from AQS by running AMP reports: AMM/State of TN
Internal Audits <i>Ozone</i>	AMM or Tech not responsible for the monitor	Quarterly	AMM loads files into AQS	AQS Retrieved by running AMP reports.
External Audit <i>All Monitors</i>	Contractor (3 rd Party)	Yearly	Contractor	AMM/Techs/Director/AQS
State Audits <i>All Monitors</i>	State of TN	Quarterly	State Auditor	Director, AMM, Techs, AQS, State Managers
Data submission to AQS/ <i>All Data</i>	AMM/Techs	Quarterly	AMM/Techs	AQS: Data loaded AMM: AMP Reports Public: for data requests
Data submission to AirNow <i>All Continuous Data</i>	Automated	Hourly	Automated	AirNow Real-time Mapping
EPA TSA Air Monitoring <i>All Monitors</i>	EPA's Laboratory Services and Applied Science Division	3 yrs	AMM completes questionnaire	EPA/AMM/Director/Techs
EPA NPAP <i>Ozone</i>	EPA Contractor	20% of sites per year (2 sites)	EPA Contractor	EPA/AMM/Techs/Director AQS
EPA PEP <i>PM_{2.5}</i>	EPA Contractor	Yearly	EPA Contractor	EPA/AMM/Techs/Director AQS
Engineering Department				
State Review Framework Evaluation (SRF)	EPA Region 4 Enforcement	unspecified	EPA Region 4	EPA/Engineering Manager(EM) /Engineers/Director
Oversight Inspections	EPA Region 4 Permitting	unspecified	EPA Region 4	EPA/EM/Engineers/Director
All Departments				
State Certificate of Exemption/ Paper Audit Entire Program	Executive Assistant with help from AMM, EM, OM, Direc.	2 yrs (on even yrs)	Executive Assistant	State of Tennessee Board

6.1. Operations

6.1.1. City of Chattanooga Financial Audits

The City of Chattanooga hires an independent accounting firm yearly to perform a financial audit of the Bureau finances. Any irregularities would be addressed at that time.

The Bureau provides reimbursements for Bureau required travel. The City of Chattanooga follows the Federal General Service Administration (GSA) reimbursement schedule, provided online, which specifies how much is allowed for housing and meal reimbursement for locations around the US. Reimbursements are audited by the City of Chattanooga.

Fee money collected must be documented on a special form and deposited in the bank within 3 days per City of Chattanooga policy. Fee money cannot be collected personally by the person that is responsible for a permit. In other words, no Bureau employee can accept any form of payment in the field. Payment should be mailed to the Bureau and money or checks can only be handled by the Executive Assistant, the Administrative Coordinator, the Administrative Support Assistant, and the Public Relations Specialist, as a fill-in, during burning permit season. No other employee may accept payment.

6.1.2. Federal Financial Audits

The Bureau does not have a large enough budget to require a Federal audit. Federal audits are required for budgets over \$5,000,000.

6.2. Air Monitoring

6.2.1. Network Review

The Air Monitoring Manager prepares an air monitoring Network Review yearly required by *40 CFR Part 58 Subpart B, 58.10 (a)(1)*. It is submitted to the State of Tennessee about April 1 to be included in the State of Tennessee's Monitoring Plan submitted to EPA by July 1 of each year. The State's Monitoring Plan, including the four local program Network Reviews, is posted for public comment for 30 days before submission to EPA. The Network review evaluates monitoring needs and determines if the network is adequate. The Review includes a yearly equipment evaluation where the equipment is listed with the purchase year and rated as to its condition. The Network Review, beginning in 2017, also includes site evaluations.

EPA Region 4 considers Chattanooga-Hamilton County to have a waiver of the PM₁₀ monitoring requirement. Chattanooga-Hamilton County has been directed by EPA to discuss the waiver of the PM₁₀ monitoring requirement yearly in the Network Review, and request it in the 5-year Network Assessment.

The Network Review is purposed as a reference document for the Bureau. An attempt is made to yearly record information of historical significance.

6.2.2. Quality Control Reviews of Precision and Accuracy (Audits)

Precision, Flow Checks, Recalibrations

Bureau Air Monitoring Technicians perform flow checks and leak checks on every PM_{2.5} particulate monitor every month. Automatic precision checks using field calibrators are performed on the ozone monitors every three (3) days during ozone season. Span checks are performed automatically every six (6) days. Precision and span checks, therefore, occur on the same day every 6 days. All valid ozone precision checks are loaded into AQS. Recalibrations between scheduled calibrations are performed as necessary.

All flow data and precision checks are entered into AQS from the FRM and continuous monitors. PM_{2.5} FRM monitors are collocated at the Siskin Drive site (470654002) for precision.

6.2.3. Internal Air Monitoring Audits

Bureau internal audits are performed with audit equipment designated for Bureau audits only, and the devices or instruments are yearly certified NIST traceable. Audit equipment is used for no other purpose.

The Manager has a deltaCal solely purposed for internal particulate audits and a field ozone Thermo Environmental Instruments, LLC, 49i calibrator that is NIST certified to the Athens SRP10 and shuttled between sites for ozone audits only. The Manager's equipment for internal audits is not used for any other purpose.

The Technician has his own audit devices for flow checks, temperature checks, and pressure checks. There are stationary field ozone calibrators at each ozone site for routine automated precision checks, span checks, and zero checks. The Technician uses the stationary instrument for calibrations.

All three ozone calibrators (two from the sites and the one purposed for audits) are transported to be certified against the SRP10 in Athens yearly. All three ozone calibrators, then, are secondary standards (Level 2) rather than the traditional tertiary (Level 3). The Bureau does not own a bench standard. Since the Manager's ozone audit instrument is a secondary standard, it could be used as a replacement stationary standard in the event of a site calibrator failure.

The Air Monitoring Manager performs internal audits of the ozone monitors quarterly. If the Manager is not available, the audits can be performed by the Technician responsible for the particulate monitors. Particulate monitors are not internally audited every quarter since the state performs quarterly independent audits, and monthly flow checks by the operator are performed and entered into AQS quarterly.

Table of Internal Auditing Devices: Figure 4

Internal Auditing Devices			
Vendor	Model	Pollutant or Parameter	NIST Certification Month
Thermo Environmental Instruments, LLC	49ips (there are 3- one at each of two sites and a specified audit instrument)	Generates ozone	January SRP10 EPA's Laboratory Services and Applied Science Division in Athens
Mesa Labs /BGI 336	deltaCal for Technicians	Temperature, Pressure, Flow	Sent to vendor: May
Mesa Labs /BGI 420	deltaCal for Manager	Temperature, Pressure, Flow	Sent to vendor: August
Mesa Labs /BGI 586	tetraCal	Temperature, Pressure, Flow	Sent to vendor: August
Inter-Mountain Labs-981109A	Chinook (critical orifice)	Flow	Sent to vendor: May
Cole Parmer	Digital Thermometers	Temperature	Not normally used since deltaCals and tetraCals were acquired. Can be compared against deltaCal NIST certifications to be NIST certified, if needed.
Inter-Mountain labs 1-D1189655	Digital Manometers	Pressure	Sent to IML with Chinook for certification

In rare quarters, one of the two ozone sites may not be audited. The first and fourth quarters are audited in March and October. This provides audit data that can be compared against the state audits in the instance where there is some kind of data controversy. The Bureau, therefore, usually has two audits per quarter entered into AQS for each ozone monitor. One is by the State, the other is performed by the Bureau.

All Bureau ozone audits are performed through the intake probe. No audits are performed at the back of the instrument. The sample lines are plumbed so that the tubing from the stationary calibrator can be moved to the audit calibrator, a switch is manipulated through the data logger commands, and the ozone can be introduced from the audit calibrator through the probe to the monitor. The Bureau avoids auditing on a predicted high pollution day. When the audit is completed, the calibration line that has been moved to the audit calibrator is moved back to the stationary calibrator, and the switch on the logger is triggered to begin sampling ambient air.

The Bureau auditor must let the monitor stabilize before enabling the logger to officially record ambient data. If the data is not reasonable, the logger is not enabled until the data is logical or the problem is resolved. If the data is recorded as official but the monitor has not stabilized, it is more difficult to void those hours.

Internal audits of ozone sites by the Air Monitoring Manager have been useful for more than just auditing the monitors. The auditor notes the condition of the shelter, skims through the

logbook for anything unusual, and notes anything observed with the monitors that requires discussion with the Technicians. Surprise internal audits are sometimes performed.

The Technician and the Air Monitoring Manager review each precision and span report generated by Airvision the morning after the check is performed. Reports are printed from Airvision and stored.

It is very important that the auto checks are timed correctly in the automation so that the report is indicating the correct precision or span check. If the timing is off as to when the readings of the automatic check are taken, the logger can record an incorrect number when the monitor goes back on-line. This is the first item that should be investigated if the precision or span data is indicating a significant difference from actual (> 3 ppb).

6.2.4. External Air Monitoring Audit

The Bureau may hire an external third party auditor to audit all equipment once a year. Any external auditor will be required to provide NIST certification certificates for all auditing equipment.

6.2.5. State of Tennessee Air Monitoring Audits

The State of Tennessee audits all Bureau air monitoring sites once a quarter and provides an audit report to the Bureau Director and Air Monitoring Manager. State auditors bring their own NIST traceable audit equipment and must be able to produce certificates of NIST traceability. Bureau Technicians are to accompany State Auditors to the monitoring site with Bureau auditing equipment. Any disagreement between the State auditor and the Technician must be resolved while the two employees are at the site. If the State finds a suspicious or failing monitor, the Bureau Technician is to confirm the findings with his/her own NIST certified local equipment. The Technician is not to leave the site with the State Auditor until a dispute is resolved. It is very difficult, if not impossible, to resolve an issue or disagreement after the two have left the site.

In a situation where the auditor and the Technician operator cannot agree on the results of an audit, the Air Monitoring Manager will be contacted and will go to the site to attempt to settle the dispute. The Air Monitoring Manager may request that the State make another trip to the site and redo the audit with different equipment or a different calibration of the same equipment.

6.2.6. Data Submission to AQS

The Air Monitoring Manager and the two Air Monitoring Technicians share the responsibility for loading AQS data. This is by design so that if a person resigns or retires, there are still employees in the Air Monitoring department that are proficient in loading data.

Proficiency in AQS loading is integral to the duties of the employees in the Air Monitoring Department. Since loading is required by *40 CFR*, there must always be trained individuals prepared to evaluate data and perform the data loading to meet Federal statutory requirements.

Each employee is assigned files to load quarterly so that their skills and passwords with AQS remain current. At this point in time the assignments are as follows: the Air Monitoring Manager creates and loads flow check and accuracy files; the ozone technician loads continuous files and creates and loads ozone precision files; and the particulate technician loads FRM PM_{2.5} files. The Manager reviews the files assigned to the Technicians and notifies the Technicians when the files are approved to load.

Both Technicians inform the Air Monitoring Manager when the loads are complete for the quarter. The Manager runs AMP reports to confirm the data are entered, then sends electronic copies of AMP reports, usually 350, 450NC, and 251, in an e-mail to the State, usually to the State AQS employee and the State Air Monitoring Contact, to demonstrate that the data have been entered. If data are determined to be incomplete after AMP reports are run, the Manager will notify the person responsible for loading the data, the data will be loaded, and AMP reports will be re-run. All Null Value Codes should be placed where data is missing. If not, they must be added and the reports re-run. AMP reports will only be sent to the State once all data has been loaded, the AMP reports reviewed, and all Null Codes are present. The Air Monitoring Manager is ultimately responsible for all data loading and confirming data load completion. Any important correspondence relating to AQS should be copied to the State of Tennessee.

Any new Air Monitoring employee should be sent for AQS training since the Air Monitoring Department has so few employees. AQS training is now provided at or before the National Air Monitoring Conference every two years. If training is needed before it is provided by EPA, it may be possible to arrange to send an employee to the state or another agency for training. New employees should be required to do regular submittals to keep their access and loading skills current. Employees that do not often use AQS must go through reregistration if they have not submitted regularly. Reregistration may not be a fast process. AQS is constantly being reprogrammed as updates are made in the software. To be able to function in the software, one's skills must remain current.

Audit files are built by the Air Monitoring Manager. Audit results for all monitors and flow checks for PM_{2.5} monitors are entered into AQS by the Air Monitoring Manager and are retrievable by running AQS AMP reports. Precision data are entered for ozone by the Air Monitoring Technician. Precision data are automatically generated by AQS for particulate data, providing POC 2 data is entered. The POC 1 and 2 data comparisons are on AMP reports.

NPAP and PEP audit data for the Bureau are entered into AQS by EPA employees or EPA's contractors. Those files should be inspected by the Air Monitoring Manager for accuracy of loading.

EPA allows 90 days from the end of the previous quarter to load the quarter's data into AQS (note this is sometimes less than three months). The Bureau attempts to load the data near the end of the second month of the quarter to provide for a month of extra time in the event there is some kind of loading problem. If one waits until the end of the 90 day period, the additional traffic in AQS can cause delays in feedback or the AQS system may crash. It is, therefore, beneficial to load data before the last minute. There is also less traffic on the AQS Help line.

AQS passwords are now designed to be more complex. They must be 12 characters and contain one capital letter, one number, and one character (hash sign has been causing problems). The password is only good for 60 days (EPA is trying to change it to 90 days) which means that one has to remember to change it or get a new password every quarter. The password cannot contain real dictionary words or words made from letters and symbols that look like words. One must call the EPA Helpline, select 9, and ask for a password reset if a password has expired. A temporary password will be assigned to access AQS, then the password can be changed under the Security tab in AQS.

EPA does have an AQS Helpline at 1-866-411-4372 from 6 AM to 9 PM Eastern. One must select "9" but the prompt will not tell you to select "9" for AQS. The Helpline may have to return the call if it is during times of high traffic. The call center can also be reached electronically at epacallcenter@epa.gov or by fax at 703-674-1008. If immediate assistance is necessary and the Helpline is not available, call another agency or the State of Tennessee AQS- assigned employee.

Loading to AQS is done through the EPA Exchange Network which requires a separate password.

Data entered into AQS are certified by the Bureau Director according to the *40 CFR* date of May 1 of the following year. Ozone data may be certified after October 31 for the current year and before the end of the calendar year if that year's ozone data certification is critical to designation status. Certification of all the previous year's data by May 1 is a rather tight deadline considering the Network Review is also due to the State of Tennessee around the same time period.

The Bureau has an excellent record of loading AQS data on time or early and certifying data on time. EPA considers the AQS regulatory loading deadlines a priority and expects the agency to meet the deadlines.

EPA expects the data to be verified before being loaded into AQS. EPA immediately provides data to any interested party, such as scientists for studies, even though the data are not certified until the following year. Because of this, EPA expects the data to have been thoroughly validated and verified before being entered. The data, however, can be removed for cause during the time period between data loading and certification.

EPA Region 4 has been sending a yearly memo to agencies detailing what is expected for submission to EPA with the Certification letter due May 1. The submission requirements change from year to year as new AQS reports are designed and as EPA personnel changes. It is important that the submission for certification complies with whatever requests are made by EPA that year. EPA, in this documentation, specifically states what data are required to be certified and what AMP reports from AQS are required to be submitted for certification. AMP reports are submitted to prove the data has been entered as stated.

A letter is sent to EPA requesting certification. EPA has specific language to be included: "the data are true and accurate taking into consideration the quality assurance findings." Also the letter should state specifically what data are to be certified and what data, if any, are being

excluded from certification and the reason. After the data are loaded, the Air Monitoring Manager enters AQS, selects Certification from the top menu, and checks "Recommends Certification" for each monitor. When EPA concurs, EPA Region 4 personnel access the same screen and checks that EPA concurs for each monitor. For full certification, therefore, both the agency and EPA have to provide the checks recommending the data be certified in that AQS Certification screen. EPA will not make checks for concurrence for certification until the Bureau has made its checks.

Any changes in AQS data for a past certified year will automatically remove the AQS checks, and a letter must be sent to EPA requesting recertification. Bureau employees may have to recheck the screen under certifications for each monitor, and EPA will have to again add the concurring check. Changes in uploaded data for audits and flow checks do not usually change the certification status. A change for one monitor does not change the certification status for the others. It is prudent, however, to go to the certification screen after any change of past data to make sure the certification status was not affected. Past data should not be left uncertified. Once the EPA concurrent flag has been removed, EPA should immediately be sent a letter requesting certification of the changed data. Data left uncertified in a critical three-year period might be problematic during a period of new designations.

The certification letter should be sent to more EPA employees than the Regional Administrator. A suggested list would be the Region 4 contact assigned to Hamilton County, one other person at that level, two supervisors above that level, the State of Tennessee Air Monitoring Contract, and the State of Georgia Air Monitoring Contact. Any receipts or response e-mails should be attached to the letter of certification and retained.

6.2.7. Data Submission to AirNow

Data is submitted to AirNow by way of an FTP site. The submittal is programmed in the local Airvision software on a computer at the Bureau offices. The responsible person for making sure the data is reported correctly to AirNow is the Ozone Technician who monitors the status warnings on Airvision. The employees responsible for making sure the ozone data reporting is cut off during the ozone down months and reported during reporting months are either the Technician responsible for the ozone monitors or the Air Monitoring Manager. AirNow data is real-time, not certified, and may not match the data in AQS after data to be submitted to AQS are validated and verified.

There may be an instance, however, when quality assurance restrictions placed on the data by the AirNow software (or the Bureau through AirNow) must be removed to accurately reflect a pollution event. This occurred in November, 2016, when the rate of increase and the magnitude of the data exceeded the AirNow quality assurance restrictions. The Bureau contacted AirNow officials to have the restrictions removed so AirNow would reflect the extremely elevated data. The Bureau can access the website and make changes as well. During times of elevated data due to a pollution event, Bureau employees should view AirNow mapping on a daily basis to confirm it is reflecting real data. If AirNow is not indicating real data, Bureau employees must contact AirNow officials.

6.2.8. EPA Technical Systems Audits

EPA's Laboratory Services and Applied Science Division (LSASD) performs a monitoring department Technical Systems Audit (TSA) every three years. A lengthy questionnaire is answered which is a comprehensive investigation of quality assurance activities. Field activities, monitor maintenance schedules, laboratory related activities, and data management activities are evaluated for strengths and weaknesses. The auditors thoroughly review all data for the three year time period. There is a question/answer session with the Air Monitoring Manager where EPA inquires about specific data days and Null Value Codes that have been selected for voided hours. EPA will review data charts and log books. A written summary report is prepared by the auditors. EPA will make site visits. EPA may take apart inlets to confirm that maintenance schedules are being met. Program problem areas are identified and corrective actions may be proposed.

EPA's evaluation comments currently are put into three categories: **Findings** which are regulatory violations or significant guidance deviations, **Concerns** which are practices thought to have a detrimental effect on the data quality, and **Observations** which are infrequent deviations that may not affect work quality but may affect future quality. The final report is submitted by EPA to the Director and the Air Monitoring Manager, and it is discussed with the Air Monitoring Technicians.

Unless EPA states otherwise, the TSA audit requires a response from the agency and a further follow-up report to confirm corrective actions have been taken. EPA may perform a TSA audit without notice if there have been serious issues to be corrected. EPA may audit between scheduled audits.

6.2.9. Performance Audits- National Performance Audit Program (NPAP) and the PM_{2.5} Performance Evaluation Program (PEP)

National Performance (NPAP) audits are conducted by U.S. EPA Region 4 Laboratory Services and Applied Science Division or their contractor for gaseous monitors. Ozone monitors are audited through the probe using a mobile lab containing ozone generating equipment. Ozone audits are entered into AQS by EPA employees or the EPA Contractor for the NPAP program.

The PM_{2.5} Performance Evaluation Program (PEP) evaluates a Bureau monitor against a portable FRM particulate monitor collocated by EPA personnel and run on the same day at the same site. Particulate PEP audits are entered into AQS by EPA's PEP contractor or the Laboratory Services and Applied Science Division. When the PEP audit is performed, the EPA contractor or EPA employee takes photographs in all cardinal directions around the site.

Loaded NPAP and PEP data should be reviewed by the Air Monitoring Manager for accuracy before the data is certified for the year.

6.2.10. EPA Engineering Enforcement (SRF) Audit

The State Review Framework Evaluation (SRF) is performed when EPA visits and evaluates the Bureau's enforcement activities. The schedule for this audit is unspecified.

6.2.11. EPA Engineering Permitting Inspection Audit

EPA sends a team to the Bureau. They review specific permits and request to inspect those facilities. EPA provides a report of the findings. The schedule for this audit is unspecified.

6.2.12. State of Tennessee Certificate of Exemption Audit

A Bureau paper audit which covers all facets of Bureau activity: air monitoring, emissions inventory, permitting, and engineering activities is performed by the State of Tennessee when the Bureau applies to the State of Tennessee for a Certificate of Exemption every two (2) years (on an even year schedule). The Bureau sends a massive file of documentation of all Bureau activity and grant reports to the State each time the Certificate of Exemption must be renewed. The State confirms that the Bureau is adequately meeting Federal requirements in all departments before the Certificate of Exemption is approved for a new time period.

The Bureau Executive Assistant is notified by the State of Tennessee when the Certificate of Exemption package is due and she/he is responsible for collecting and assembling the reports and documents requested by the State. The Executive Assistant notifies each Department Manager what documents are requested and then collects the copies, either paper or electronic, from the Department Managers. The Executive Assistant compiles the file, ensures it is complete, and then sends it electronically to the State Board for review. The Certificate of Exemption is approved at a State Board meeting. The State then issues a new Certificate of Exemption for a two year time period.

6.2.13. Quality Assurance Project Plans

The Chattanooga-Hamilton County Air Pollution Control Bureau prepared an agency Air Monitoring QAPP that was approved by EPA April 23, 2007, and resubmitted in 2015. An updated version of the November 14, 2015, QAPP was submitted to EPA March 8, 2018, and was approved September 14, 2018.

The Air Monitoring Quality Assurance Project Plan (QAPP) integrates technical and quality aspects of planning, implementation, and assessment into a single document. It addresses field and laboratory activities, data verification and validation, data storage and retrieval, data assessment, project task evaluation, and process improvement. The EPA approved QAPP, therefore, addressed all facets of the agency's monitoring data quality program. It serves as a reference document for implementing an Air Monitoring quality assurance program and provides detailed operational procedures for monitoring processes.

The Air Monitoring Manager is responsible for writing and updating the Air Monitoring QAPP. The Air Monitoring Manager will discuss specific items with the Technicians that are employed in the department. The Technicians will be required to read and sign that they have read the entire QAPP.

A list is kept in Air Monitoring of minor changes to be made as the changes are proposed, and the document is not resubmitted until there are major changes or five years have transpired- whichever is first. The document expires in five years and must be updated and resubmitted to EPA before the expiration date. The draft document is submitted to, reviewed, and notated

by the Bureau Director. Changes are made according to his or her recommendations, then the document is submitted to EPA.

The draft QAPP is submitted to EPA's Laboratory Services and Applied Science Division (LSASD) special e-mail address: R4airqa@epa.gov. The address automatically records submittals and sends a confirming e-mail as a receipt. The site does not always record submittals properly so it is wise to e-mail a copy to several other LSASD employees at the same time and follow-up if no acknowledgement is made that it was received. The Air Monitoring Manager should determine to whom at the LSASD the QAPP has been assigned for review, then there can be direct communication with that EPA employee about the QAPP. The QAPP is evaluated and possibly electronically notated with EPA's request for changes. The QAPP is returned to the Bureau for the changes to be made. There may be lengthy verbal discussions with the EPA assigned representative before final approval is made by the LSASD. The QAPP may be sent back and forth to EPA more than once before final approval.

The EPA approved 2018 QAPP is stored in the Air Monitoring Manager's office, the Bureau Director's files, and on the bookcase in the lab. An electronic version is on the Air Monitoring bookcase on a flash drive.

The Emissions Inventory QAPP, approved January 28, 2011, and an update submitted August 10, 2017, addresses verification and validation of the Emissions Inventory. Air pollutant emissions data from point sources, nonpoint sources, onroad sources, nonroad sources, and event sources are stored and submitted to the NEI. The Emissions Inventory Quality Assurance Project Plan is stored in the Engineering Manager's office and the Bureau Director's files.

The Emissions Inventory QAPP and updates are submitted by the Engineering Manager to the Quality Assurance Manager and the Approving Officer at Region 4, both in the EPA Atlanta office. There is a different procedure for submittal and review for the EI QAPP than for the Air Monitoring QAPP. The August 10, 2017, EI QAPP was approved April 12, 2018, by Dr. Egide Louis, the Exposure and Human Health Risk Assessor, of EPA Region 4.

6.2.14. Standard Operating Procedures

Standard Operating Procedures (SOPs) are required by EPA for the Air Monitoring Department. They provide written instructions in a stepwise manner through sampling, analysis, data handling, and other operations. SOPs provide some standardization between agencies-especially since there can be multiple operators in a designation area and multiple vendors' equipment (or different models of the same vendor equipment) used in a network. EPA allows each agency to personalize their SOPs. SOPs are particularly useful in training new employees, especially when highly specialized employees retire.

When federal and state regulations change or new types of monitors are purchased, Bureau SOPs have to be updated to reflect the changes. The SOP for a new monitor is to be submitted to EPA within six months of the initiation of operation. The SOPs must be simple enough for a nontechnical person to be able to follow the directions. They must be complete so that no steps are omitted. They must be consistent with sound scientific principles. The SOPs must provide routine analysis of environmental data and determine if data type, amount, and quantity

are acceptable. They must demonstrate the validation of data at each step of recording, calculation, or transcription.

Vendor manuals sometimes leave out important operational steps. The SOP should supply any deficiencies in the instrument manual.

The SOPs are written either by the Technician responsible for the instrument or the Air Monitoring Manager. The Air Monitoring Manager will review the Technician's version and rewrite it to make sure all necessary procedures are included. The original author may be determined by whomever has the time to produce it. The Air Monitoring Manager is ultimately responsible for all SOPs to make sure they are written and current.

SOPS are submitted to the special e-mail address at the LSASD: R4airqa@epa.gov. Several employees of the LSASD should also be copied. The special address is supposed to register a submittal automatically and send a response e-mail. It does not, however, always register submittals properly. If a document is submitted and no response is received from EPA, an inquiry should be made to ensure that the document was received.

SOPs are stored on a bookcase in the Air Monitoring laboratory in a notebook. Electronic versions are on a flash drive also stored on the bookcase.

Figure 5 lists the SOPs for the Bureau's current equipment and the EPA approval dates. The current procedure is to submit the SOP to EPA after internal Bureau approval, and it is filed at EPA.

Table of Approved SOPs: Figure 5

Name	Revision #	Approved
SOP for PM _{2.5} FRM TEI R & P 2025	2	3/24/16
SOP for Ozone TEI 49i, TEI 49ips, 8832, 8872 loggers	14	12/17/15
Data Handling SOP	5	5/23/16
T640 PM _{2.5} Continuous SOP	0	In process

6.2.15. Data Processing, Verification, and Validation

Chattanooga has a Data Handling SOP approved by EPA May 23, 2016.

Data verification is the process used to ensure that specific activities are completed as required. The verification process ensures that the correct sites are sampled, the correct sampling days are used, and FRM filters are exposed, stored, and shipped as required. For a continuous monitor the verification process is similar. Data is reviewed and Null Value Codes are added for missing data where maintenance, power failures, calibrations, or precision and span checks occurred.

Data validation substantiates that data produced by the Chattanooga-Hamilton County Air Monitoring Department meet the quality assurance criteria set forth in the QAPP and SOPs so that data is of the quality and quantity to compare with the NAAQS. Validation involves determining by the Quality Assurance Manager, in this case the Air Monitoring Manager, if data

are acceptable for the data set or not acceptable based on operational activities, monitoring parameters, and laboratory criteria. EPA has developed critical criteria parameters for each criteria pollutant. Data that does not meet those criteria (pink section) will be scrutinized on an individual basis and may be voided with Null Value Codes.

Null Value Codes must be used for missing data to describe why the data is missing. The Null Value Codes are specific to the activity that caused the data loss. For example, Null Codes for a maintenance activity should not be used for data lost for an audit. EPA requires the codes to be accurately used.

EPA also requires the codes to be consistently used. Since agencies have their own unique way of doing things, EPA requests consistency within an agency. For example, if a specific code is used for a maintenance activity, then the same code must be used every time that activity is performed. In other words, EPA does not want the same activity to be coded different ways. EPA does inspect proper use of the Null Codes during the Technical Systems Audit.

Data validation starts with proper siting of the monitors, use of FEM or FRM monitors operating under the FEM or FRM approved method (available on EPA's website), proper sample handling, proper instrument calibration, proper precision and audit checks, and proper corrective actions if the monitors fail. The validation ends with review of all the data multiple times for reasonableness and completeness. Data produced outside of the EPA established critical criteria are under consideration to be voided or flagged and data within those parameters are retained.

Data are validated after being received from the laboratory and before loading into AQS. Data that does not violate a critical parameter can be flagged and still remain in the data set, depending upon the specific circumstances. All data are validated quarterly before it is entered into AQS and again after loading. Data are further reviewed before data certification.

Data are collected from the continuous ozone and particulate monitors hourly by modem dial-up to the data loggers. The data are collected into the Agilaire Airvision software on a computer at the office. The Bureau purchased AV Trends which is a backup site data acquisition system for each ozone site. AV trends functions as an electronic strip chart. Currently AV Trends is linked to the logger. If a poll is missed for some reason, the data missed will be picked up on the next poll. The ozone 49i instruments contain internal data loggers, and data can be recovered from the instrument in the event of a logger loss. The internal loggers do not retain as much as the external loggers so it is important that data loss is addressed immediately for data recovery in the event of a logger failure.

Metadata for the FRM PM_{2.5} monitors are downloaded from the monitors quarterly and, after proofing by both an Air Monitoring Technician and the Manager, are sent by e-mail to IML. Data for the PM_{2.5} Federal Reference Monitors are received back from Inter-Mountain Laboratories in two formats: an Excel™ spreadsheet with easily readable report files and in an AQS loadable text format file. The Bureau does not consider these reports final data. The Air Monitoring Manager reviews the files upon receipt, then approves for the Technician to load them into AQS. The files are proofed a second time by the Manager by reviewing AMP reports after they are loaded into AQS. The IML reports and the AMP reports are stored on the Monitoring Manager's computer.

Because data may be removed from the data set after reviewing the files returned from IML, the IML data set may not match what is entered into AQS. An AMP report printed from AQS reflects the final data.

Because temperature and humidity excursions have been an issue in the past in PM_{2.5} weigh labs across the southeast, the Manager specifically reviews the temperature and humidity charts IML sends with their reports to confirm that the temperature and humidity were in the regulatory ranges when the filter weighing took place.

The Bureau has a Data Handling SOP approved by EPA that details the way air monitoring data is processed and quality assured in Hamilton County.

The Air Monitoring Manager is responsible for processing, verification, and validation. Technician duties are divided: the ozone technician is responsible for ozone and continuous PM_{2.5} monitors and the particulate technician is responsible for three (3) FRM three-day monitors. The particulate technician is currently performing the Stage I Vapor Recovery inspections of roughly 200 gas stations along with his Air Monitoring duties. Each Technician proofs his/her own data, then the Air Monitoring Manager reviews it. The Air Monitoring Manager reviews the data sent to IML and returned from IML. The Air Monitoring Manager approves for data to be loaded into AQS by the Technicians. When data is loaded by the Technicians and the Manager into AQS, the Manager runs AMP reports to confirm the data is entered. The Manager reviews the AMP reports for reasonableness and completeness. AMP 350, 450, and 251 are run at a minimum. When all the data are entered for the quarter, those reports are provided to the State to demonstrate that the data has actually been loaded.

Exceptional Events

Exceptional pollution events can cause data to be abnormally elevated. In some instances, EPA will allow the abnormally high data to be removed from the data set for comparison against the NAAQS. The Bureau must request exceptional event status from EPA Region 4. EPA has two types of flags in AQS- an informational "I" series flag indicating the agency believes there was an event but does not intend to take further action or an "R" series flag that indicates the agency is going to apply for formal exceptional event status for those dates. EPA has extensive Exceptional Event request procedures in *40 CFR* and in guidances. The procedures involve flagging and explaining exceptional events in AQS, writing technical support papers, publishing the papers for public comment, and submission deadlines. EPA may or may not agree with exceptional event flagging requests. Elevated ozone data due to exceptional events are particularly difficult to prove to EPA's satisfaction. EPA has developed tools on several websites to assist in evaluating events.

Data for which EPA formally approved exceptional event status are eliminated from the data set when the AMP design value report is run. Some AMP reports indicate data with the EE approved flags and also without that data in the data set- so the data set can be evaluated both ways. Data for which EPA does not agree were affected by Exceptional Events cannot be removed from the data set even if the Bureau believes substantial proof exists. The Bureau can flag data from an event EPA did not approve with an "I" series informational flag.

Large pollution events can affect more than one region of EPA. If the Bureau is interested in applying for an event, it is prudent to review other submissions for the same event, if they exist, before submitting technical documentation for the Bureau. If another agency has done significant work on the proof, it may be that the Bureau would not need to submit as much documentation. At:

<https://www.epa.gov/air-quality-analysis/treatment-air-quality-data-influenced-exceptional-events>

under *Example Demonstrations and EPA Responses under the 2016 Exceptional Events Rule* there is a page of approved submissions. A Bureau employee, therefore, can review the posted technical papers as an example of what EPA expects in a submission.

EPA will not grant an exceptional event request unless the event affects the designation status. If an event may affect a future designation, the Bureau will flag the data in AQS, go through the procedure, submit the request, and EPA will only make a decision if it becomes necessary during a designation process. It is critical that Bureau personnel understand that a well-documented event can be important to a future design value.

Table of Processing, Verification, and Validation Tasks and Responsible Parties: Figure 6
 In Figure 6- 2.12 refers to QA Guidance; Appendix L refers to 40CFR Part 50 Appendix L

Pollutant	Responsible Employee	Task	Regulation, SOP or Guidance	
Continuous Ozone and Particulate	Technician	Minute data collection downloaded by dial-up/telemetry hourly for ozone and PM _{2.5} /PM ₁₀ into Airvision	Data Handling (DH) SOP	
	Technician	Monitors Airvision status alarms entire workday	DH SOP	
	Technician	Data is also downloaded hourly from a second logger at each site. A PC using AV Trends collects ozone data at the site.	DH SOP	
	Technician & Manager	Review graphs of minute data every workday morning- Sat and Sun reviewed on Monday.	DH SOP	
	Technician & Manager	Investigate anything unusual on the graphs	DH SOP	
	Technician & Manager	Review results of automated Precision and Span checks the morning after they run	DH SOP	
	Technician	Reverifies or Recalibrates if precision is 3 ppb off	DH SOP	
	Technician	Reviews data to prepare files for AQS	DH SOP, Part 58 Appendix P	
			Puts data in AQS format	DH SOP
			Adds Null Codes	DH SOP
	Manager	Reviews data	DH SOP	
			Approves it to be loaded to go into AQS	DH SOP
	Technician	Loads data to AQS	DH SOP, Part 58.16	
	Manager	Builds files, Loads particulate flow checks and accuracy data to AQS	DH SOP	

I		Runs AMP reports	DH SOP
		Determines if data is missing, if so Manager or Tech loads missing data, runs AMPs again	DH SOP
		Reviews AMP reports for reasonableness of data, missing data, completeness, and Null Codes	DH SOP
		Notifies State data when all data is loaded	DH SOP
PM _{2.5} - Filter data	Lab	Preconditions and weighs filters, loads cassettes. Notifies State data is loaded	2.12, DH SOP
PM _{2.5} data	Lab	Sends cassettes filters to Bureau. Preconditions filters	2.12, DH SOP
	Technician	Records filter data into local lab log. Sends filters to Bureau	DH SOP
	Technician	Loads filters into instruments and programs instrument. Records filter data into local lab log	2.12, App L: 10.5 DH SOP
		Records data from instrument on field sheet. Loads filters into instruments	2.12, App L:10.11; 10.122.12; 10.5
		Retrieves exposed filters. Records data from instrument.	2.12, App L:10.132.12;10.11; 10.12
		Transports filters to office refrigerator. Retrieves exposed filters	2.12, App L:8.3.62.12, App L:10.13
		. Transports filters to office refrigerator	2.12, App L:8.3.62.12, App L:8.3.6
		Downloads operational data from instruments Mails exposed filters to lab	2.12, App L: 10.11. 10.122.12, App L:8.3.6
		Downloads operational data Reviews/Proofs operational	DH SOP; 2.12; App L: 10.11; 10.12
	Manager	Reviews/Proofs operational data	DH SOP
	Manager	Reviews log book in lab- looks at any inconsistencies between log and identifying information in operational data: checks exposure dates/ filter IDs/ and operational flags	DH SOP
	Technician	Sends downloaded operational data to IML electronically after Manager's approval. Reviews log book in lab.	DH SOP
	Lab	Records internal temperature of cooler upon receipt; records temp from min/max thermometer in shipment	Lab SOP
	Lab	Conditions and reweighs exposed filters	2.12: Lab SOP, DH SOP
	Lab	Supplies reports to Bureau	Contract specification, DH SOP
	Lab	Supplies data in AQS format in text file to Bureau.	Contract specification, DH SOP

	Manager	Reviews IML lab report and text files	DH SOP, Contract specification, DH SOP
	Manager	Approves data to be loaded into AQS. Reviews IML lab report	DH SOP
	Technician	Loads data into AQS	DH SOP, Part 58.16
	Technician	Notifies Manager when data is loaded	DH SOP, Part 58.16
	Manager	Runs AMP reports	DH SOP
	Manager	Reviews AMP reports for reasonableness of data, missing data, and Null Codes	DH SOP
		Notifies State when all data is loaded	DH SOP
Exceptional Pollution Events	Manager	Identifies and investigates event- flags and explains event-related data in AQS	DH SOP, 40 CFR 50.14; DH SOP
Exceptional Pollution Event	Manager	May submit letter of intent to apply for EE status. Identifies and investigates event. Flags event-related data in AQS	DH SOP, 40 CFR 50.14
		May submit technical paper for event argument	DH SOP, 40 CFR 50.14
Certification	Manager	When data has been entered into AQS and quality assured by May 1 of the following year, a certification letter is sent to EPA (and AMP600) and the appropriate boxes are checked in AQS to recommend certification	DH SOP, Appen. L

6.2.16. Data Provided to Outside Entities

Before data are provided to outside entities, data are proofed and confirmed to be correct by running AQS AMP reports. Data is provided in AMP report form if it is for raw data. The AMP reports are easily readable by a nontechnical person and easy to transfer electronically since they are in PDF format.

6.2.17. Data Storage

Downloaded hourly data from continuous monitors is stored on a computer at the office that is on a network server. That data is backed up every two weeks on CD so that there can be no data loss of more than two weeks from computer malfunction. Minute data files must periodically be removed from the computer and stored to keep from filling up the memory. The Central computer has an uninterrupted power source to protect against short power failures. Uninterrupted power sources have been installed at the two ozone sites. AV Trends running on a PC at each of the two ozone sites are also recording data. In the event of the central computer loss at the office, the data will be recorded at the individual sites.

Data acquisition, therefore, is by four methods at each ozone site. AV Trends is collecting data on a PC at each ozone site, and Airvision is collecting data by polling ozone and continuous PM_{2.5} on the Central computer at the office. The monitor itself has an internal data logger from which data can be recovered. The Bureau in 2018 is using a back-up logger at each ozone site. Each logger is attached to the back of the instrument so that if the primary logger is lost, the secondary logger can also provide the data. Each back-up logger is polled by Airvision.

Minute data are collected from the primary logger, and hourly averages are collected from the secondary logger.

6.2.18. Data Reduction

Data reduction is the process of taking the numbers generated by measurements and using mathematical and statistical processes to determine what the raw data means. EPA does reduction on the AMP reports. AMP reports provide design value calculations, data completion calculations, and some statistical analyses.

Data can be copied from AMP reports into Excel™ spread sheets or data can be placed by AQS into delimited form and transferred to Excel™ spread sheets. Data manipulation can be performed. The Air Monitoring Manager will graph Bureau PM_{2.5} FRM data against the Walker County, Georgia, site for comparison since that site is in the designation area. The Manager may also graph data against other nearby sites. There are several EPA web sites that provide graphing functions and other useful tools.

Occasionally data from the AQS design value report should be hand calculated for comparison to the report as the Bureau has found inaccuracies. Once a year should be sufficient. This report is critical and the data must be correct.

AirNowTech is very useful for tracking real-time data from areas nearby. The website is <https://www.airnowtech.org/> Users must have a user name and password. Then one can select the sites of interest and watch the data real-time. During a pollution event the real-time graph can be left running to show all Bureau continuous sites and nearby sites in order to follow the event while it is happening. This was done during the November 2016 fire event in the Hamilton County area in order to follow the high data in the region in real time.

EPA has provided data assessment tools at <https://www.epa.gov/outdoor-air-quality-data>. These tools can be helpful in reviewing exceptional pollution events.

The Bureau does not usually perform modeling of air monitoring data. The MOVES transportation model, however, has been run at the agency in the Engineering Department. Modeling has sometimes been done for the agency by the State of Tennessee modelers.

6.2.19. Documentation

EPA's position is that if something is not documented, then it never happened. Verification and Validation should be documented as if the data must be defended in court. Any activity performed at a monitoring site must be recorded in the bound log book for the specific monitor.

Continuous monitoring activities must also be recorded in the logger "Log" in the 8872 (ozone sites) or the "Central Messages" in the 8832 (PM_{2.5} site). Messages are programmed to download hourly to the Airvision central computer at the office. Placing messages in the logger is using the logger as an electronic log system.

FRM filters installed and retrieved must be listed by filter number in the instrument log book so there can be no confusion which filters were installed or retrieved. Log books must be copied quarterly and the copies stored in the lab.

The bookcase in the lab is a central location for documentation. Except for what is stored on computer or over five years old, all major documentation should be on the bookcase. The PM_{2.5} lab log is kept at the PM_{2.5} Technician's desk. There is also a flash drive on the bookcase which contains copies of the current SOPS, QAPP, QMP, Five Year Assessment, and Network Reviews.

Security for the laboratory is maintained by locking the interior and exterior door when the lab is unoccupied. If the Air Monitoring Manager is using the printer, the interior lab door may be left unlocked long enough for printing to be completed. The Manager can monitor the doorway from the Manager's office.

6.3. Engineering

6.3.1. Emissions Inventory

There are no SOPs required for the Engineering Department. The facility permitting procedures are detailed in the Air Pollution Ordinance in the City of Chattanooga and the Hamilton County Codes. The same ordinance is adopted by the nine municipalities in Hamilton County.

The Engineering staff uses codes, manuals, and engineering or chemical books for reference. A list of some of the commonly used materials is provided here:

- Title 40 *Code of Federal Regulations* Subchapter C (Air Programs), Parts 50-99
- *The Federal Register*
- *Air Pollution Engineering Manual* (Former AP-40)
- "Compilation of Air Pollutant Emission Factors (AP-42)"
- *Perry's Chemical Engineers' Handbook*
- *CRC Handbook of Chemistry and Physics*
- *Lange's Handbook of Chemistry*
- *The Properties of Gases & Liquids*
- *Hawley's Condensed Chemical Dictionary*
- *The Merck Index*
- *Basic Principles and Calculations in Chemical Engineering*
- *Shreve's Chemical Process Industries*
- *Dangerous Properties of Industrial Materials*
- Source Classification Code (SCC) listings online
- North American Industrial Classification System (NAICS) code listings online
- U.S. EPA New Source Review (NSR) Training Manual
- Visible Emissions Evaluation Instruction Manual
- Baseline Source Inspection Techniques [Air Pollution Training Institute (APTI) Course 445] Manual
- Control of Particulate Matter Emissions [Air Pollution Training Institute (APTI) Course 413] Manual

- Control of Gaseous Emissions [Air Pollution Training Institute (APTI) Course 415] Manual

The Engineering Department prepares for EPA a Compliance Monitoring Strategy (CMS) every two years that determines the frequency of facility inspections.

Emissions Inventory data are updated as industries are inspected or when changes to the inventory are reported. A thorough evaluation of the Emissions Inventory is conducted every three years before the inventory is loaded to the NEI. The Emissions Inventory is stored in a local database on the Bureau server. In 2017 every facility's emissions data was evaluated and updated if necessary.

Air pollutant emissions data are required to be submitted triennially by air agencies to the EIS for all sources, with the exception that agencies may choose to accept emission estimates that are provided by the EPA for specified sources. Future triennial NEI reporting years are, 2020, 2023, etc.

Actual annual emissions of the following criteria air pollutants (CAPs) and CAP precursors are required to be submitted by air agencies to the EIS:

- Primary total particulate matter (filterable and condensable) $\leq 2.5 \mu\text{m}$ ($\text{PM}_{2.5}$)
- Primary total particulate matter (filterable and condensable) $\leq 10 \mu\text{m}$ (PM_{10})
- Nitrogen oxides (NO_x)
- Sulfur dioxide (SO_2)
- Carbon monoxide (CO)
- Volatile organic compounds (VOCs)
- Ammonia (NH_3)
- Lead and lead compounds

The Bureau will also continue to voluntarily submit to the EIS actual annual emissions of any of the 187 hazardous air pollutants (HAPs) from permitted facilities that are included in the Bureau Emissions Inventory. Furthermore, the Bureau will begin to voluntarily submit to the EIS any actual annual greenhouse gas (GHG) emissions of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) that are available from permitted facilities.

The NEI consists of air pollutant emissions data from five data categories in Figure 6.

Table of Types of Sources and Derivation: Figure 7

Types of Sources		How derived
Point Sources	Quantifiable	Actual
Nonpoint	Too small or too numerous to quantify	Estimated Collectively
Onroad	Onroad vehicle emissions	Estimated by modelling
Nonroad	Nonroad vehicle emissions	Estimated by modeling
Wildfires/Prescribed Fire Event	Fire emissions	Estimated by date of occurrence, size, location, and published emission factors/modeling

Point sources

Point sources are stationary sources of quantifiable air pollutant emissions. Any stationary source that has emissions that equal or exceed any of the following thresholds is defined to be a point source:

- Potential emissions of 1,000 tons/yr for CO
- Potential emissions of 100 tons/yr for primary PM_{2.5}, primary PM₁₀, NO_x, SO₂, VOCs, or NH₃
- Actual emissions of 0.5 ton/yr for lead and lead compounds

The Bureau, however, will continue to voluntarily treat all permitted facilities as point sources, with the exception of gasoline dispensing facilities, dry cleaning services (NAICS Code 812320), and automotive body, paint, and repair shops (NAICS Code 811121). Airports and rail yards are also classified as point sources.

Nonpoint sources

Stationary sources of air pollutant emissions that are not inventoried as point sources are considered to be *nonpoint sources*. They are typically too small or too numerous to inventory individually, so emissions from these sources are estimated collectively at the county level by their Source Classification Code (SCC). Some of the sources within this broad data category are agricultural activities, gasoline dispensing facilities, certain categories of fuel combustion equipment, certain facilities that use solvents (e.g., dry cleaning services), and dust from roads and construction. Furthermore, commercial marine vessels, locomotives, and aircraft are also categorized as nonpoint sources even though they are mobile sources.

Onroad sources

Onroad sources are mobile sources of air pollutant emissions that encompass motor vehicles that travel on public roads. Automobiles, trucks, motorcycles, and buses are included in this data category. Onroad sources are grouped by SCC, and emissions from them are estimated by using county-level inputs to a computer model.

Nonroad sources

This data category includes off-road vehicles, construction equipment, and lawn and garden equipment. Emissions from *nonroad sources*, grouped by SCC, are also estimated at the county level through the use a computer model.

Event sources

Event sources consist of large wild fires and prescribed fires. Air pollutant emissions from these sources are specified by the day that the fire event occurred.

Required Annual Reporting

Air pollutant emissions data is required to be submitted annually by air agencies to the EIS for point sources that have potential emissions that equal or exceed any of the following thresholds:

- 2,500 tons/yr for NO_x, SO₂, or CO
- 250 tons/yr for primary PM_{2.5}, primary PM₁₀, VOCs, or NH₃

Currently, only one source within Hamilton County meets a threshold for annual reporting of air pollutant emissions data. This source is Volkswagen Group of America Chattanooga Operations, LLC, which has potential VOC emissions in excess of 250 tons/yr.

7. CORRECTIVE ACTIONS FOR DEPARTMENTS

Any issue in a Bureau department or program, especially a departure from a regulatory requirement or a City Code requirement, must be identified, investigated, a cause determined, a remedy proposed, and the remedy enacted. Then, all must be documented. The remedy is the corrective action.

If a corrective action must be taken at the employee level in a department, the manager of the department is responsible for implementing, tracking, and verifying that either the manager or the employee performed corrective actions that were completed in a timely manner. If the corrective action must be taken at a management level of a department, the Director is responsible for implementing, tracking, and verifying that the manager performed corrective actions that were completed in a timely manner.

Careful documentation is an essential function of corrective actions. If the corrective action is performed but not documented, data could be lost due to the lack of documentation. Any legal action that requires a data or data acquisition defense hinges on the quality of the documentation. Legal action can last many years and memories are unreliable in recalling undocumented corrective actions.

Table of Corrective Actions for Departments: Figure 8

Problem	Corrective Actions	Responsible Party
Operations		
Financial Irregularity	Investigate, identify cause, and remedy	Director or Operations Manager
Reconciling budgets with EPA distributions	Rework budgets to reflect actual funds (Calendar budget, City budget, Federal budget, PM _{2.5} 103 budget- all different)	Administrative Coordinator
Human resources complaint	Investigate and remedy	Operations Manager Director
Air Monitoring		
Poor data quality	Investigate, identify cause, and remedy	Air Monitoring Manager
Questionable data that can be defended technically	Prepare technical document to submit to EPA	Air Monitoring Manager
Data incompleteness	Investigate, identify cause, and remedy	Air Monitoring Manager
Data loss on FRM particulate monitors	Make-up samples can be run for FRM particulate monitors on specific days	Technician/Manager
Not meeting AQS loading deadlines	Identify cause and remedy	Air Monitoring Manager
Extreme data from Exceptional Event	Flag data in AQS and prepare technical EE document to submit to EPA	Air Monitoring Manager
Issue in Contract Lab	Contact the Supervisor, determine the problem, the Supervisor remedies the problem and provides documentation that the remedy has been enacted	Contract Lab Supervisor/ Air Monitoring Manager
Engineering		
Facility Permitting	Investigate, identify issue, and remedy	Engineering Manager
Emissions Inventory	Verify facility-reported emissions, update incorrect numbers in the database	Engineering Manager or Engineering designee

7.1. Operations

Corrective actions may be required for the budget as grant money allotment amounts may change from the amount originally budgeted. Since the City budget year does not coincide with the Federal budget year, the budget is complicated.

7.2. Air Monitoring Program

When air monitoring data or data completion falls out of acceptable criteria range, it is to be reported to the Air Monitoring Manager. The Air Monitoring Technician is to identify the corrective action, the time frame of the corrective action, the verification that corrective actions were taken, and the amount and type of data loss, if any. If ozone data loss exceeds 12 hours, the Bureau Director is to be informed of the loss and the corrective action proposed or enacted by e-mail from the Air Monitoring Manager.

When data loss is anticipated to exceed more than 25% in a quarter, the Bureau Director, the EPA Regional Administrator, and the EPA designated representative for Tennessee will be notified by e-mail and in writing as soon as the data loss is discovered or it is determined that data must be voided. A letter to EPA will address the data loss, the cause, the remedy, and when the remedy was enacted. Data deletion can occur the following year as data is reviewed and the final quality assurance occurs for certification. Large data losses are serious and should be treated as such.

At some time or another every agency faces a data loss crisis. The Air Monitoring Manager must evaluate the situation to determine if some action can be taken to preserve the data in question.

The data issue must be well defined to attempt to preserve data. The Air Monitoring Manager reviews the applicable regulations, reviews the data date by date and line by line, and determines if data loss due to some identified issue is anticipated. If an issue is identified, the corrective action must be enacted. Then, the Manager reviews data from the identification of the issue to the documented remediation. The Manager determines the amount of data loss expected. If data loss for particulate is not over 25% in a quarter, then the data loss is documented and no petition is made to EPA. The effort is not reasonable if the loss is not catastrophic- even if the data can be defended. On the other hand, if data loss is determined to be over 25% in a quarter for particulate, then the Manager must make a determination if data can be saved by a technical defense. There are numerous nearby sites that can be used for data comparison. The Rossville, GA, Maple Street site is only about 3.5 miles from the East Ridge, Tombras Avenue, site.

EPA expects data to be voided if the temperature in a gas shelter is outside of specific acceptable critical criteria parameters (noted in pink on the critical criteria sheets). Thermo's 49i was approved for a wider temperature range in July 2018. Therefore, data collected outside of the 20-30 degrees C range is now acceptable.

Exceptional Events

If there is a benefit to applying for exceptional event status, the Bureau must follow the procedure to apply. If there is not an immediate apparent benefit, consideration should be given to any potential benefit in the future- since design values are based on three (3) year averages. Failure to recognize the importance of seeking event status for an event can be economically costly if that failure affects the designation negatively. EPA has specifications about appropriate flagging of the data in AQS, timelines for making application, and a 30 day public notice requirement. Data that EPA approves for an exceptional event flag is removed from the data set for the comparison against the NAAQS.

Fireworks

Data elevations due to fireworks activity are normally approved for Exceptional Event Status by EPA. Fireworks activity is apparent on the continuous PM_{2.5} daily graphs New Year's Eve, New Year's Day, and around July 4. There is a major fireworks show at the end of the Riverbend Festival in June that produces a signature on the continuous graph. There are

approximately 17 public, municipal, and private fireworks events in the Hamilton County area around July 4. Depending upon the day of the week where July 4 falls, the events can be on the same day or disseminated. The Fire Marshall informs the Bureau by e-mail of groups that have applied for fireworks permits. The Lookouts, the local professional minor league baseball team, had fireworks displays scheduled for 16 games during the 2017 season. The T640 continuous monitor is being operated as a Special Purpose monitor, therefore the major concern is if a fireworks event affected the FRM data running on a 3-day schedule. If the T640 is operated as a Federal Equivalent Monitor, then all frequent fireworks events must be more closely monitored and documented.

Prescribed Burns

Data elevations have been detected on the continuous PM_{2.5} monitor from US Forestry burns in North Alabama or North Georgia. They will also be indicated on the NOAA Fire Hazard Map with a smoke balloon. If those elevations fall on an FRM run day, then the fire should be documented in the event the data returns from the lab as extremely elevated. The spike on local monitors sometimes occurs at 3:00 or so in the afternoon when a large prescribed fire elsewhere is being extinguished for the day.

Research must be done on a near daily basis during episodes of elevated pollution as it is more difficult to research an event after the fact. There is a delay getting FRM filter weigh data back from the lab since the filters are mailed every two weeks. If it is important to immediately be informed if a filter has unusually elevated particulate. The laboratory supervisor at IML can be contacted and the supervisor can send the preliminary weights to the Bureau.

Prevention of data loss, preserving quality data, and flagging event data are very important in producing a data set that can accurately be compared against the National Ambient Air Quality Standards. There is no excuse for significant data loss, except for a power failure on a long weekend, since the Bureau's sites are near the Bureau office and can be accessed on short notice. Temperature in the shelters must be closely monitored so in an air conditioner or heating failure the monitors do not become too hot or cold, operating outside of critical parameters. The Bureau has a spare for every type of monitor and spare data loggers so a failing monitor or logger can be replaced on short notice.


It is imperative that allowable make-up samples be run for missed FRM PM_{2.5} run days. If a regulatory sample day is missed, the sample can be made up in the next two days or on the same day of the week the following week. The FRM monitors are not to be scheduled for off run days unless it is for make-up data.

7.2.1. Inter-Mountain Laboratories

A laptop is used to download operational metadata from the FRM monitors. The electronic files are reviewed by the Technician first, then the Air Monitoring Manager. The filter number, cassette number, and the date of exposure are checked against a log book in the lab to make sure there is no contradiction. Any corrections are made in filter or cassette numbers in the download, determinations are made as to if any data should be voided, and files are e-mailed to the IML Laboratory Supervisor.

Each filter that is sent to IML from the Bureau is accompanied by field data recorded by the Bureau Technician on data sheets. Note that each filter is bar coded for IML's automatic identification and data capture (AIDC) software.

IML Field Data Sheet Example: Figure 9

Chattanooga		Cassette ID: <u>795</u>
Sampler ID:	Avg. Temp:	
Sample date:	Avg. Pressure:	
Sample run time:	Sample vol:	
Removal date/time:		
Use Before	CV:	Comments:
3/3/2016	T5,534,630	

If there appears to be an issue with any metadata downloads from the instruments or field data sheets sent to IML by the Bureau, the IML Laboratory Supervisor contacts the Air Monitoring Manager and the Air Monitoring Technician responsible for PM_{2.5} and the issue or inconsistency is resolved.

The data are reviewed by the Air Monitoring Manager upon receipt from IML. This data is not "final" data. The data is Quality Assured a second time after receipt. The Manager reviews the readable format Excel™ report IML sends and also reads through the raw data lines in a text file. The Manager determines if more data should be voided and the reason. Specific data might be discussed with Technicians

The Manager then sends the raw data formatted for AQS to the Technician who loads the data into AQS. If the AQS formatted data is rejected by AQS for formatting issues or there appears to be a laboratory issue with the weights, the IML Laboratory Supervisor is contacted and the issue is resolved. The IML data in text format is loaded to AQS, and numerous AMP reports are run after the data is loaded to confirm the data is loaded (AMP 251, 350, 450 or 450 NC at a minimum). The reports are reviewed for completeness, for the proper addition of Null Value Codes, and for reasonableness. If AMP reports indicate that data are missing, the responsible employee is notified and the data are loaded. Once the missing data are loaded, the AMP reports are run a second time to demonstrate all the data are loaded. If data are found to again be missing, the employee is contacted, the data are loaded into AQS, and confirming AMP reports are run. This process is performed until all data are confirmed by AMP reports to be entered.

The IML Laboratory Supervisor is notified if a monitor is replaced with a different serial number monitor. Any change in the method is also communicated to the Laboratory Supervisor so that the method code can be changed in the AQS files.

The Bureau supplies the lab with plastic petri dishes and vinyl tape for sealing the petri dishes. This is unique to the Bureau as most agencies ship filter cassettes in zip bags, capped cassettes, or canisters. The petri dishes are used to ship unexposed filter-loaded cassettes to

the Bureau and exposed filter-loaded cassettes back to the lab. The lab contacts the Bureau when supplies are running low and the Bureau ships supplies to IML. The Bureau tries to keep a full case of petri dishes on hand. Vinyl tape must be purchased in large quantities so a supply of vinyl tape is also always kept at the Bureau. The Bureau uses trip blanks that are sent from the lab, never opened, and returned sealed. If the blanks are elevated, the difference happened at the laboratory, not the Bureau, and the Bureau will contact the laboratory. The Laboratory Supervisor and the Air Monitoring Manager discuss the possible reason for elevated trip blanks and a remedy is devised.

IML is contracted to prepare the AQS files for loading. The files are inspected before loading and AMP reports are run after loading to make sure void lines have been added and are properly coded.

7.3. Engineering Permits

Facility permits are written by the permitting Engineer and reviewed by the Engineering Manager and the Director. Any correction needed is made. A new or revised permit is then posted for a 30 day public comment period, if required, and presented to the Air Pollution Control Board, if required, at the end of the comment period. The permitted industry sends a representative to the Board meeting to answer any questions from the Board or the public. The permitting Engineer also attends the Board meeting to be available for any questions.

A facility contacts its permitting Engineer if a process change or expansion is to take place. The permit is altered accordingly, reissued, and posted for public comment through the same process.

7.3.1. Emissions Inventory

If there appear to be incorrect data in the emissions inventory, the facility of interest must be contacted and the emissions data corrected. Correct data in the inventory are critical when modeling is required for a submittal to EPA. The emissions inventory data were verified for every entry by the Engineering Manager in 2017 before the 2017 inventory submission.

8. CORRECTIVE ACTIONS FOR INDIVIDUAL PROGRAMS

Table of Corrective Actions for Individual Programs: Figure 10

Problem	Corrective Actions	Responsible Party
Outdoor Burning		
Illegal Fire/No permit	Extinguish fire or call local Fire Hall- Issue Warning NOV or NOV	Investigator/Director
Stage I Vapor Recovery		
No vapor recovery equipment or incorrect equipment/ no permit	Must install proper equipment and obtain permit No cooperation: Warning NOV or NOV	Engineer/ Engineering Manager/Director
Dry Cleaners		
No permit	Work with owner to obtain permit, Warning NOV or NOV	Engineer/Engineering Manager
Asbestos NESHAP		
No permit	Job may be halted until permit is obtained, inspection/ Warning NOV or NOV	Investigator/Director
No inspection	Job will be halted until inspection is performed/ Warning NOV or NOV	Investigator/Director
Improper handling	Job will be halted for testing unless job has been completed /Warning NOV or NOV	Investigator/Director

8.1. Outdoor Burning Program

If corrective action must be taken for outdoor burning, the fire is extinguished. If the fire cannot be readily extinguished by the means available, the Fire Department for that area is called to put out the fire. If something has been burned that is of concern for other environmental agencies, the Investigator contacts the State of Tennessee Solid Waste, City Stormwater, or the appropriate agency. Enforcement action may be recommended to the Director. A Warning Notice of Violation (WNOV) or a Notice of Violation (NOV) may be issued.

To promote communication among government departments, the Bureau Investigator may teach classes to City, County, Municipal, and State permitting agencies and local City, County, and Municipal Fire Departments so that agencies will recognize air pollution issues and know whom to contact.

8.2. Stage I Vapor Recovery and Dry Cleaner Permitting Programs

Corrective actions for the Stage I Vapor Recovery and Dry Cleaner permitting programs require making sure the proper equipment is installed and functioning correctly. The Engineer or Director designee determines any issues with equipment installation and function and discusses with the owner or manager how to resolve the issue. The Engineer re-inspects until the issue is resolved.

The permitting employee must keep abreast of the building of new gasoline stations to ensure that they are properly permitted. These also require a public notice, a 30-day public comment period, and the opportunity for a public hearing, if requested.

Also, critical paperwork for the Dry Cleaners must be completed. Dry Cleaners have to report to the Bureau if they cease using perchloroethylene. Enforcement action may be recommended if a reasonable resolution of any issue is not reached.

8.3. Asbestos NESHAP Permitting Program

Corrective action for the asbestos NESHAP program may involve the Investigator halting the renovation or demolition, requiring submittal of a notification, requiring a survey from a qualified asbestos inspector, writing a permit, and requiring the removal of asbestos. The NESHAP Coordinator may contact other state and local agencies with an interest in mishandling of asbestos, such as City Stormwater, state solid waste, the state asbestos accreditation program, Tennessee OSHA, or any other interested parties. Several agencies can work together on a violation. A Notice of Violation (NOV) with potential fines is issued if a notification was not submitted and a permit obtained.

9. PERSONNEL QUALIFICATIONS AND TRAINING

9.1. Selection of Bureau Employees

When a position becomes vacant, the Bureau posts the position through the City of Chattanooga Personnel Department. The posting under *jobs* at www.chattanooga.gov lists the minimum educational and experience requirements for the position. At one time a test was required for the Air Monitoring Technician, Engineering, and Public Information Specialist positions. Currently no tests are being given to Air Pollution applicants. If a test is given, the test is administered by the City Personnel Department to those who have applied. In the past the applicants were screened by City Personnel and the top six scorers on the test or the top six applicants' applications were sent to the Bureau to be reviewed. Currently, all applications are sent to the Bureau by HR upon the manager's request.

If HR performs the initial screening and no satisfactory applicant is found among the top six, then the next six applicants' applications are sent to the Bureau, and so on, until two or three appropriate candidates are found.

If HR does not perform the initial screening, the department manager reviews all the applications, selects the most desirable candidates, and schedules and performs the initial interviews. Leading candidates are re-interviewed and may be interviewed a third time. Once the field is narrowed to two or three, the candidates are interviewed by the Director. Once a candidate is selected, he or she is offered the position. If the candidate accepts the position, he or she is hired by the Air Pollution Control Board. References are contacted before hiring.

9.2. Program Specific Training

Training is:

- individualized based upon the department to which the employee is assigned.
- individualized based upon the new employee’s past work experience. For example, a new hire in engineering that has many years’ experience in air pollution permitting will require less training than a recent college graduate in engineering with little or no experience.
- provided on the job by either the manager of the department or an experienced employee.
- provided by sending the new employee to: EPA sponsored classes, training sessions by the Air Pollution Training Institute (APTI), another agency for shadowing, or conferences, if funding is available.

Proposed training for each major department’s new employees is listed in Figure 11.

Proposed Training for New Employees: Figure 11

Operation’s Department Training
Mayor’s Office Training
City Fiscal Training
City Procurement Training
City Human Resources Training
Computer Classes (if not computer literate)
EPA Federal Grant Training at yearly Grant Conference
Training in City Inventory
Air Monitoring Department Training
Training at another agency by shadowing an employee
Vendor technical classes (usually an associated cost)
AQS Training at the National Air Monitoring Conference
Training by shadowing a Bureau employee
Training at APTI Training Courses
Read and sign all SOPs, QAPP, and QMP
Smoke Opacity “Smoke School” Accreditation
Engineering Department Training
APTI Training Classes
Shadow a Bureau employee to Facility Inspections
EPA provided conferences and training
Emissions Inventory Training/Conferences
Read Emissions Inventory QAPP
Smoke Opacity “Smoke School” Accreditation

The Bureau has had little employee turn-over in the last fourteen years. As about half of Bureau employees are approaching retirement age, there is expected to be a significant change in personnel by 2023. Training, then, will be more critical as fewer experienced employees will remain. Training must be designed to maintain the Bureau at the same quality level than before the retirements.

The Operations Manager and the Director attend the Region 4 Grants and Planning Meeting every year.

The Air Monitoring Manager or an Air Monitoring designee attends the Region 4 Air Monitoring Workshop every year. This Workshop is not optional. It is very important that the Manager attend, if at all possible. It is the vehicle through which EPA disseminates important information to the Monitoring Managers. One Air Monitoring Technician may attend the yearly Region 4 Air Monitoring Workshop or the National Air Monitoring Conference with the Manager if funds allow. The Technicians rotate attendance. The Air Monitoring Manager attends the National Air Monitoring Conference which is now combined with AQS training. AQS training is offered for one or two days before the conference and is critical training for a new employee in Air Monitoring.

EPA has been providing quality assurance training for air monitoring in Region 4 since 2015. EPA expects all air monitoring agencies to participate by sending at least one employee. This training is not optional unless some crisis prevents attendance. The Air Monitoring Manager may attend with one Technician if the funds are available for the additional employee. The Manager and the Director will decide whether the training is most suited for the Manager or the Technician or both. This training is especially valuable for a new employee.

The Engineering Manager and one Engineer has Professional Engineer (PE) status and two engineers have Engineer in Training (EIT) certification. To maintain PE status The Manager and the Engineer must complete 24 Professional Development Hours (PDH) every two years. The Engineering Manager has attended enforcement workshops and permitting workshops hosted by Region 4. Two engineering staff members have attended APTI 419b "Preparation of Fine Particulate Emission Inventories". One staff member has attended training to enter required information into the EPA emission inventory system, NEI.

The Bureau Engineer, an Engineering designee, or the Air Monitoring Technician, if filling the position, may attend workshops in Stage I Vapor Recovery and Dry Cleaner Inspections.

The Bureau Investigator may attend workshops, seminars, or webinars in enforcement. The primary person responsible for the asbestos program, currently the Bureau Investigator, may attend the Southeastern States Asbestos Coordinator Workshop, known as SESAC.

The current Director, who is an attorney licensed to practice law, attends the Spring and Fall Region 4 Air Directors' meetings, and the National Association of Clean Air Agencies membership meetings. He has attended numerous enforcement workshops and conferences, as well as continuing legal education courses.

All conference and training attendance is dependent upon available funding. The responsibility for training documentation is in each individual department.

9.3. Environmental Health and Safety Training

Those employees whose job responsibilities put them at the greatest risk for exposure to hazardous substances and or human health hazards are enrolled in a medical surveillance program. Employees that need medical surveillance are expected to get their personal physicals yearly. The employee is expected to make arrangements through the Operations Department for appropriate surveillance tests that are outside the scope of a normal physical exam. The Asbestos Coordinator must arrange for spirometry testing.

9.4. Quality Management Training

Air Monitoring Technicians are expected to learn quality requirements from the Quality Assurance Manuals for PM_{2.5} and ozone, including data completion requirements, for data generated in the Air Monitoring Department. The Manager gives the Technician copies of important memos, notifies employees of updates in quality assurance written materials, and provides employees with new technical information.

Air Monitoring Technicians will be required to read the QMP and the QAPP. They will have an opportunity to ask questions or clarify any item not understood, then will sign that they have read and understood the documents. All Bureau employees will be required to read the approved QMP and sign that they read it.

9.5. Periodic Employee Performance Review

Chattanooga-Hamilton County Air Pollution Control conducts employee performance evaluations periodically, but not on a yearly basis. The Bureau supervisor fills out an evaluation form, then discusses the evaluation with the employee who agrees or disagrees. The supervisor reviews how well the employee is meeting work goals and objectives, the quality of the employee's work, how well the employee follows standard division policies and procedures, and the employee contribution to his or her department. The supervisor provides the employee positive feedback for performance well done and negative feedback for any deficiencies. The supervisor discusses any concerns. At the conclusion of the meeting, the supervisor provides the employee with an overall job performance rating. A copy of the performance review is placed in the employee file in the Operations Department.

10. PROCUREMENT OF SUPPLIES, EQUIPMENT, AND SERVICES

Procurement of supplies, equipment, and services is done through the City of Chattanooga Purchasing Department according to the *Chattanooga City Code, Chapter 2- Administration, Article V, Section 2, 541-543*. The city maintains contracts with specific vendors. Items must be purchased from that vendor if a City contract for that item or service exists.

Purchases under \$1,000 can be purchased directly by the Bureau. A purchase requisition is submitted by the department placing the order. The purchase requires the Director's approval. Once approved, the purchase is done by the Administrative Coordinator or a Director designee with the City of Chattanooga credit card.

In some circumstances a request can be made to use a City purchase credit card. If the City purchase card is used locally by a Bureau employee, forms must be filled out at the store with the EIN number, the employee must sign the form, and the receipt must be brought to whomever is the holder of the card. A note must be put on the top of the receipt stating why the item was purchased, the department, and the purchaser's name or initials.

Items less than \$25 needed for a department can be purchased and reimbursed from petty cash by turning in a receipt to the Executive Assistant. A note must be put on the top of the receipt stating why the item was purchased, the department, and the purchaser's name or initials. No items can be reimbursed without a receipt.

Purchases over \$1,000 must be routed through the City approval system and ordered through the City Purchasing Department. Three (3) verbal quotes are required for items that cost between \$1,000 and \$4,000. Three (3) written quotes are required for items that cost between \$4,000 and \$10,000.

If the City of Chattanooga has multiple vendors on contract for the same type of service, a quote should be obtained from each vendor before selecting a vendor even if the amount of the service is less than \$1,000. If a large project involving numerous vendors is over \$1,000 total, the City still expects three quotes, if possible, for each facet of the project. If the City only has one vendor on contract for a particular service, then the Bureau can use that one vendor without obtaining quotes. The contracts rotate expiration so the City posts a new list of contracted vendors monthly. The current list should be reviewed. If there are only two vendors for a particular service on contract, only two quotes are required.

For purchases over \$1,000 the Bureau is responsible for obtaining the quotes from at least three vendors, if possible. A purchase requisition is prepared by the department making the order. A memo explaining why the Bureau needs to order the item should be attached. Vendor promotional materials may be attached to the requisition for additional explanation. The purchase is initially approved by the Director, entered into the City purchasing system by the Administrative Coordinator or a Director Designee, and the quotes are sent by messenger or electronically to City Purchasing. The request is processed and approved by City Purchasing, reapproved by the Bureau Director electronically, and a purchase order is issued by City Purchasing to the vendor.

It is the Bureau's responsibility to follow the progress of the requisition through the electronic City system. There may be a problem, such as improper coding, that has to be corrected before the City processes the order. If the progress is not being checked in the database, then the order will be delayed until somebody at the Bureau realizes the order is delayed.

If the purchase requisition is for services, the Bureau may contact the service company to make sure the company received the purchase order from the City Purchasing Department. The Bureau then schedules the work with the service company. It is the Bureau's responsibility to schedule the work once the purchase order has been issued.

Purchases are required to be bid:

- For a sole source item
- For a \$10,000 or above item

The bidding process can only be circumvented when:

- There is a city or state contract for the item or service
- The item costs less than \$1,000, and it can be ordered with a Bureau credit card
- There is a justification for sole sourcing (as in using one brand of equipment)

If the Bureau uses a particular instrument vendor and must sole-source a purchase to avoid having multiple vendors of the same equipment, an explanation in the form of a sole source memo must be provided to the Director and City Purchasing as to why the vendor was selection and why the instrument is not to be bid. City Purchasing may contact the ordering department with questions.

Each department is responsible for preparing procurement documents. The department manager prepares the purchase requisition and sends it to the Bureau Director. The Director approves the order and forwards it to the Administrative Coordinator or a Director designee who processes the order. The Coordinator orders the item or sends the documents to the city to process.

Few purchase requisitions require technical or quality assurance requirements to be incorporated into the procurement documents. In the case of a laboratory services bid or quote it may be necessary to cite quality assurance requirements as part of the procurement documents or bid specifications. If a contractor is solicited for a bid or quote to perform audits of air monitoring equipment, citations from *40 CFR* and quality assurance manuals may be used in the procurement documents.

The Air Monitoring Manager is responsible for knowing what equipment is a Federal Reference Monitor (FRM) or Federal Equivalent Monitor (FEM) and whether a FRM or FEM monitor must be ordered for the Air Monitoring Department. The list of designated methods is on EPA's website under *List of Designated Reference and Equivalent Methods* at <https://www3.epa.gov/ttn/amtic/criteria.html> . The Manager is also responsible for knowing regulations (*40 CFR Part 58*) about siting in order to purchase appropriate equipment or a shelter for a site.

10.1 Grant and Contract Agreements

The Bureau enters into grant and contract agreements for services, activities, and equipment. Federal grants require a grant application and follow-up grant reporting to be submitted on specific dates. The yearly Federal 105 grant is prepared by the Operations Manager. The PM_{2.5} 103 Grant is prepared by the Air Monitoring Manager and reviewed by the Operations Manager. The Engineering Manager may prepare a grant for special studies. Grants for special studies require grant submittals and a separate QAPP procedure for quality control of any data generated in the special study.

Grants have follow-up reports that are required on specific dates. Each Department of the Bureau must keep up with Federal Grant reports for which they are responsible. The Administrative Support Assistant is responsible for reminding departments of their due reports and filing them in a notebook. Copies of grant reports must be retained. It is a good practice to send a report to more than one person at EPA. If a report or project is particularly important,

paper copies and electronic copies should be sent to a number of EPA employees and delivery or read receipts kept at the Bureau. Thus, if the document is lost, others have a copy.

Currently copies of important reports are sent to the Region 4 Administrator, the Bureau's assigned Regional contact in Atlanta, and two managers above the regional contact. If it is a grant requirement, copies are sent to the Bureau's Region 4 grant contact and one other person in the grant office. Copies are also sent to the State of Tennessee and can be sent to the State of Georgia, depending on the document. The yearly certification letter is, thus, widely distributed. A simple grant report, however, may be sent to the Bureau's assigned Region 4 grant contact, a second employee in the grant office, and the Bureau's assigned Air Monitoring contact at Region 4.

The QMP and QAPP correspondence will be sent to the regional Tennessee contact in Region 4 Atlanta and employees in the Laboratory Services and Applied Science Division (LSASD) of EPA in Athens. QAPP submittal, all important correspondence with the LSASD about the QAPP, and internally approved SOP submittals are to be sent to a special email address R4airqa@epa.gov. There is a separate email for the QMP R4qmp@epa.gov. An e-mail to one employee at the LSASD is copied to others in the same office. A copy is sent to the Chief of Superfund and Air Section, Field Services Branch, of the Laboratory Services and Applied Science Division in Athens. The Bureau no longer certifies through the Post Office all documents sent to EPA as some documents are sent by e-mail. Therefore, it is important to keep confirming e-mails or e-mail receipts attached to the paper documents in the file. It is essential, then, to send copies to multiple individuals at EPA. In the case of the yearly certification letter, paper copies are sent to all parties that have been e-mailed, but the Bureau no longer certifies the paper copies at the Post Office.

11. INFORMATION SERVICES

The Information Technology Department (IT) of the City of Chattanooga sets up computer purchasing contracts. The Bureau has a three year rotation plan for computer replacement. Any computer upgrades necessary for operating a department must be communicated to the Director and communicated to whomever at the Bureau is purchasing the monitors. Otherwise, whatever computer is on contract is purchased. Standard operating software is purchased with the computer packages. Additional specialty software is ordered by the individual Bureau departments. The Bureau has its own server. The telemetry system for the continuous monitors is on a computer that is on the City of Chattanooga network.

The City IT Department also performs computer maintenance and upgrades on agency computers. Computers with viruses are sent to the IT Department for the hard drive to be cleaned. Bureau computers and e-mail accounts are password protected. Documents can be individually locked and password protected. There is a Bureau administrator, currently an engineer, with limited abilities to make changes if an employee is locked out or needs a new password.

All Air Pollution Control employees are provided internet use as a tool for communication and research. The City of Chattanooga has protective measures, such as firewalls and antivirus software, to help preserve the integrity of data and protect software applications. The City has

maximum amounts of data that can be transmitted by e-mail. A large document to be sent by e-mail might require being sent with Google Share or put in a dropbox for the recipient to retrieve.

If the Bureau puts monitoring sites on the internet, the process must be done through the City of Chattanooga IT Department. The Department only buys specific vendor equipment, depending upon the City contracts for that year. The Bureau must work with IT on any project that involves internet or computer equipment. There must be good communication with IT if there is a critical time line for the project to be completed.

Bureau databases and the responsible employees are listed in Figure 12. These employees are responsible for the accuracy of the data in the databases. The databases and webmaster have access limited to the responsible employees or the databases require passwords to access them.

Table of Databases and Responsible Employees: Figure 12

Bureau Databases	Type	Responsible Employees
Burning Permits	Access	Executive Support Assistant/ Investigator
Stage 1 Vapor Recovery Gasoline Station Permits	Oracle	Administrative Coordinator/ Administrative Support Assistant/ Permitting Engineer
Dry Cleaner	Oracle	Engineer
Asbestos Permits	Access	Executive Assistant/Investigator
Emissions Inventory	Oracle	Engineering Manager
Agilaire-Airvision Data Acquisition System (Automated)	Sequel Server with dial up modem	Air Monitoring Technician/ Air Monitoring Manager
AV Trends	Sequel Server	Air Monitoring Technician/Air Monitoring Manager
Website- Daily Data		Public Relations Specialist

11.1. Determining Data Quality

Data from continuous monitors, the PM_{2.5} TEOM and ozone monitors, are downloaded through an hourly poll of the sites using Airvision software developed for this specific application by Agilaire. The Airvision software will put the downloaded data into text files for loading into AQS. The automatic precision checks are put in text file format through an EPA supplied P & A generator. The data is inspected by the Technician and the Manager, Voids and flags are added, and then the data is loaded into AQS by the Air Monitoring Technician. Confirmation AMP reports are run by the Air Monitoring Manager to prove the data has been entered.

Data from the Federal Reference PM_{2.5} Monitors is received in text file loading format from IML and reviewed. PM_{2.5} FRM data are loaded into AQS by a Technician.

The Air Monitoring Manager also hand-builds flow check files for the FRM PM_{2.5} monitors and the TEOM. Precision files for the FRMs are automatically generated in AQS. Accuracy files for local and State audits for all monitors are generated through the P & A generation tool

provided by EPA or hand-built. Accuracy files are loaded into AQS by the Air Monitoring Manager. If two accuracy files are entered into AQS for the same day they have to have a different number coding for each file. The first is 1, then 2, and so on. The number must be in a specific place in the data line.

The Bureau has been using Airvision since January 1, 2013. AV Trends, which is a version of Airvision for individual sites, was purchased. It has been used at Soddy Daisy for the 2017 ozone season and was installed at Eastside Utility in February 2018. The chart recorders have been removed from both ozone sites. Secondary data loggers have been set up at both ozone sites that are polled hourly.

By the time the monitoring data is ready to load into AQS or the emissions data is loaded in NEI, the data has been proofed and quality assured.

The Bureau Engineering Department loads its own emissions data into the NEI by way of EPA's CDX/ Exchange Network.

Air pollutant emission factors from applicable sections of *AP42* are checked by permitting personnel of the Engineering Department to ensure that the latest available factor appropriate for a particulate emissions source is being used. Furthermore, information presented in *AP42* background documents is used on occasion to refine *AP42* emissions factors for specific processes.

11.2. Data Storage and Recovery

Burning Permit data is entered into a local database that is backed-up incrementally every night on the local server and every week by a contractor or the City of Chattanooga. The tape is stored off site. Inspection reports for the Stage I Gasoline Vapor Recovery Program and for the Dry Cleaner programs are on the Engineer's computer and are backed up in the same manner. These three sets of records are kept for at least ten (10) years.

Air monitoring data is stored on the Air Monitoring Manager's computer, the Airvision data acquisition computer in the lab, and the two Air Monitoring Technician's computers for at least ten (10) years. Since the data is backed up, it is stored indefinitely. Monitor operations metadata (temperature, pressure, etc.) are downloaded from the Federal Reference $PM_{2.5}$ Monitors. That "operations" data are reviewed line by line for accuracy by the technician and the Air Monitoring Manager, then e-mailed to IML. IML adds the filter weights and calculates the micrograms per cubic meter. IML sends the files back to the Bureau in two formats- in a readable, printable formal report and in the raw data text files to be submitted to AQS. IML retains the raw files and a copy of their report. Data are reviewed again by the Air Monitoring Manager. The data are then submitted to AQS by the Air Monitoring Manager or an Air Monitoring Technician. Data is backed up by copying it to CDs. AQS AMP reports serve as a backup.

Asbestos NESHAP permit data is entered into a local database for permit tracking and report generation. The local database is backed up with the server back-up nightly and weekly. Before 2008, asbestos data was kept in excel spreadsheets and entered into the ACTS

program that did asbestos tracking on a national level. The ACTS program has been abolished by EPA due to funding cuts.

Because the PM_{2.5} files are proofed after being returned from IML, further changes may be made in the raw files before loading. The IML formal report, therefore, may not reflect precisely what is loaded into AQS. Therefore, the AQS AMP reports are the final authority for the data.

There is a dedicated computer in the Bureau laboratory for continuous monitoring data polled hourly from the sites by telemetry. Minute data is polled on the primary loggers. The continuous data is backed up onto CDs every two weeks by the Air Monitoring Technician who is responsible for the continuous monitors.

The Bureau in 2012 acquired the polling responsibility for Chattanooga-Hamilton County monitors for AirNow, the national real-time ozone and particulate maps, from the State of Tennessee who formerly polled the sites for the Bureau.

The Emissions Inventory Oracle database is backed-up with the incremental nightly and weekly tapes. The Inventory is also backed-up separately by the contractor so there is a dual back-up of that information.

11.3. User Training

User training is provided by taking Google or Microsoft classes, as appropriate, training from software application vendors, training sessions at conferences, and training provided by experienced staff members.

12. DOCUMENTS AND RECORDS

Documents and records must be maintained in a secure fashion to retain integrity from their creation to their final disposal. They provide the history for decisions made using environmental data collected by the Bureau. They are available for review by staff, the regulated community, and the public. Documents and records should be considered legal documents and maintained in a professional manner.

Two basic document types are generated by the Bureau: (1) documents which provide the user with a standard procedure for preparing a report or the procedure to conduct a specific process and (2) documents that report the collection of environmental data or documents where the author uses environmental data to make a decision regarding environmental protection.

12.1. Quality Assurance Records

Quality assurance records are items that furnish objective evidence of the quality of items. They have been verified as technically complete and correct. Quality assurance records may include photographs, drawings, maps, forms, reports, and electronically recorded data. Quality related documents and records must be in compliance with applicable statutory, regulatory, and EPA requirements and appropriate chain-of-custody criteria are implemented.

12.2. Identification of Quality-Related Documents

The Bureau has these quality related documents:

- Quality Management Plan (QMP) for the entire Bureau
- Quality Assurance Project Plan (QAPP) for Air Monitoring
- Quality Assurance Project Plan (QAPP) for Emissions Inventory
- Standard Operating Procedures (SOPs)
- Air Monitoring Yearly Network Review and the 5-Year Network Review
- Technical Guidance Documents
- Operation Manuals for Monitors

The QMP and the two QAPPS are required to be updated and resubmitted every 5 years. SOPs are to be submitted within 6 months of installing a new instrument or as updates are needed. The Network Review that includes the site evaluations and the equipment evaluation is due yearly to the State for inclusion in the State Monitoring Plan. There is a 5-Year review that is on a 5-year schedule.

There are two QAPPS prepared at the Bureau: the QAPP for Air Monitoring Data written by the Air Monitoring Manager and the QAPP for the Engineering Department's Emissions Inventory written by the Engineering Manager. The Bureau Director reviews and notates the QAPPS. The Air Monitoring Manager and the Engineering Manager make the Director-requested changes, then the documents are submitted to EPA. EPA returns the documents with additions or changes requested by EPA. The changes or additions are made. The document may be reviewed again by the Director to ensure the Director agrees with EPA suggested changes, then the documents are resubmitted to EPA. The Air Monitoring QAPP may be submitted to EPA multiple times. Once the documents are approved, copies of the appropriate QAPPS are given to employees in the departments. Employees read the appropriate approved version and are required to sign a form stating that they read the QAPP and that they will follow the QAPP.

Bureau generated quality-related documents for Air Monitoring are revised as needed in the Air Monitoring Department. The Bureau Air Monitoring QAPP, required to be reviewed every five years, should be reviewed once a year for potential changes. A draft will be prepared and submitted to the Director for comment before an update is finalized. The Emissions Inventory QAPP in the Bureau Engineering Department should also be reviewed yearly for changes in quality management. A list should be retained of noncritical changes in each QAPP and the document only resubmitted when a critical change is made during the 5-year period. At that time the list of minor changes can be sent. Critical revisions in the Air Monitoring SOPs are discussed with department employees.

12.3. Record Maintenance, Transmittal, and Destruction

Logbooks are kept for every monitor at each air monitoring site, either in the instrument box or in the shelter at the site. Logbooks should have no pages missing, no non-technical drawings, no cute comments, and no blank sections where information could be backfilled. Blank sections are to have an x drawn in the blank area to signify that it was left blank. Entries should

be in ink and in order. No entry should be added to a past entry unless it is a note to see a specific page for a current entry about a past event. Maintenance and notes are kept in the logbooks. Continuous monitors have messages entered "to Central" or in the "logger files" in the data logger every time maintenance or audits are done at the site. Therefore, if the logbook disappears, all of the maintenance work and any audits are still recorded in the data logger messages/log. These messages are polled and downloaded to a Bureau computer hourly with the data downloads. Logbooks are copied every quarter so that a record is kept in the lab that is identical to what is in the logbook. The Bureau downloads a printed precision data report and span report (on span days) for the ozone calibrator and the monitor.

All Air Monitoring paper records are retained for the minimum time period that is the regulatory requirement for retention. PM₁₀ filters are retained for five years in banker boxes in the Bureau lab or in the file storage room. PM_{2.5} filters are retained for one year in a freezer at Inter-Mountain laboratories. Then, they are shipped cold back to the Bureau. The filters are retained after they are shipped back, and they are stored in the Bureau freezer located in the Air Monitoring laboratory for the regulatory total of five (5) years. Filters from exceptional event time periods may be stored longer than five (5) years.

Paper copies of all installation permits, certificates of operation, and Part 70 permits for permitted facilities are maintained at the Bureau offices. Supplemental permitting forms, compliance reports, correspondence, emission test reports, diagrams of process and control equipment, and other pertinent information submitted by the permitted facilities are also maintained at the Bureau. Installation permit reports, annual inspection and full compliance evaluation reports, and emissions pre-test agreements that are written by permitting personnel of the Bureau Engineering Department and the Emissions Inventory Quality Assurance Project Plan are all kept at the Bureau as well. All of these documents and records are maintained in filing cabinets, with the exception of those for facilities that are permanently closed. Documents and records for permanently closed facilities are maintained for at least seven years from the date of closure. Electronic copies of Bureau generated reports are also available.

The Bureau Emissions Inventory is an Oracle database. It is archived for each calendar year and maintained in perpetuity. The earliest archived year is 1999. The current year and all archived years of the Bureau Emissions Inventory are accessed through an electronic file server, which is "backed up" on approximately a monthly basis with the backup files retained offsite.

12.4. Chain of Custody

The Asbestos Coordinator follows a chain of custody procedure for sample handling for asbestos. A chain of custody form is originated, signed, and dated by the person taking the sample and the same custody form is signed and dated by any additional person that takes possession. The document stays with the sample. If the sample is to be retained, it must be locked up in a desk or cabinet. There is a chain of custody form on the sample bag but these are not always retained by the laboratory without being directed to retain them. Thus, a separate custody form should always accompany the sample.

Inter-Mountain Laboratories (IML) has a chain of custody form that the Air Monitoring Technician fills out with cassette and filter information and returns it with the samples to the laboratory. Each filter cassette has the filter number, the cassette number, and the date exposed written on the petri dish with a permanent fine tipped marker. The petri dishes are transparent so the identifying information is visible through the dish. The field data sheet is copied and the sheet is cut into individual days' data. The individual field data is taped to the top of each petri dish for mailing. This is because IML uses a bar code scanner to scan each exposed filter into their system when it is received by the lab. The field data sheet is copied as a whole sheet before it is cut up, and the copy is sent with the chain of custody.

A chain of custody procedure for the handling of PM_{2.5} cassettes is described in the 2018 Chattanooga-Hamilton County Quality Assurance Project Plan (QAPP).

13. PLANNING

General planning for the Bureau involves arranging for positions to be filled when an employee is on vacation, on military leave, maternity leave, or any type of absence. Planning for absences or leave is done on the department level by the department manager.

Planning for each department is performed by the department managers. The manager determines the scope of the task and works with employees in his or her department to accomplish the task. The Bureau Director supervises the managers and the overall planning for the Bureau.

Planning must insure that the two Bureau-generated data sets, air monitoring and emissions inventory, are as complete and accurate as possible. Since there are regulatory data capture requirements for air monitoring, make-up dates must be planned to prevent data loss. Site moves or alterations must be planned carefully in order to lose the least amount of data.

Planning is also performed by the permitting programs. Inspections must be planned and executed so that required inspections and reports are done in the specified period of time.

There are very specific planning functions in each department. A list is provided in Figure 12.

Table of Department and Program Planning Functions: Figure 13

Department/Program	Planning Functions	Responsible Party
Operations	Hiring, Separation	Operations Manager
	Budget	Administrative Coordinator or Designee/Operations Manager/Director
	Insurance Coverage	Operations Manager
	Invoicing/Prepayment	Administrative Coordinator or Director Designee
	Vehicle maintenance	Operations Manager
	Payroll	Operations Manager
	Inventory	Operations Manager
	Federal Grant Report Tracking	Administrative Support Assistant/Operations Manager
Air Monitoring	Monitoring	Technician/ Air Monitoring Manager
	Data Completion	Air Monitoring Manager
	Equipment	Air Monitoring Manager
	Training	Air Monitoring Manager
	QAPP,QMP, SOPs, EEvents	Air Monitoring Manager
	Network Review, Equipment Evaluations, Site Evaluations	Air Monitoring Manager
	Install, alter, or shut down site	Air Monitoring Manager/Technician
Engineering	Inspections of Facilities	Each Engineer plans his/her own
	Writing of Permits	Each Engineer writes his/her own permits
	Emissions Inventory	Engineering Manager
	Training	Engineering Manager
	Enforcement	Engineering Manager/Director
	SIP, QAPP for EI	Engineering Manager
Burning Permits	Timely Inspections of burn sites	Investigator
	Enforcement	Investigator/Director
Stage 1 Vapor Recovery	Inspections	Engineer or Director designee
	Enforcement	Investigator/Director
Drycleaners	Inspections	Engineer or Director designee
	Enforcement	Engineer/Director
Asbestos	Review notifications	Investigator/Director
	Review Surveys	
	Inspections	
	Issue Permit	
	Enforcement	

13.1. Operations

The Operations Department has to prepare yearly budgets for City and County Commission approval. Planning has to mesh a calendar year budget, the Federal budget, the City budget, and a schedule of odd grants, all on different budget years. The budget process is extensive.

Hiring and job responsibilities are planned functions.

Planning involves acquiring insurance coverage for vehicles and employees.

Invoicing for permits is a planning function implemented by the Administrative Coordinator.

13.2. Air Monitoring

The Air Monitoring Manager supervises planning for data acquisition, evaluation, and acceptance. Air Monitoring Technicians are responsible for planning their own work schedules depending upon their assigned monitors' run schedule and the lab shipping schedules. The Bureau has FRM PM_{2.5} monitors that run on EPA's defined national 3-day schedule and report 24 hour data. The Bureau also has three continuous monitors— two ozone and one PM_{2.5}. The TEOM was phased out in early 2018 and a T640 is the only continuous monitor for particulate. The technicians must plan their monthly and quarterly monitor flow and leak audits so that the number and type of audits meet federal requirements.

Monitoring network planning is based on the type of required monitoring and the specifications for those monitors. Since the sites are now long established, the network would not require planning for site locations unless a site is required to be moved or a new monitoring requirement is adopted that requires establishing new sites.

No new sites have been added to the Air Monitoring Network in nineteen years, since the beginning of the PM_{2.5} program, although all four remaining sites have been moved. Three stayed within a mile radius and kept the same AQS number and a fourth was moved two miles and given a new number. In 1999 the Core PM_{2.5} site was originally placed in the most densely populated section of Chattanooga. The site was placed on the University of Tennessee at Chattanooga campus in the heart of downtown, then moved just off campus because it had to be continually moved while on campus (for different reasons) in six years. The second PM_{2.5} site in East Ridge is very close to the Georgia border and is now in the most densely populated area in Hamilton County. The East Ridge City Hall site, originally on the East Ridge Post Office on Maxwell Road, is operated just about 3.5 miles from the North Georgia Maple Street site. Because of the proximity to Georgia, the site has been retained even though it was originally a Special Purpose site. The two ozone sites were selected in the 1980s to place a site close to downtown (Eastside Utility) and the other downwind (Soddy Daisy High School) in North Hamilton County. The Eastside Utility site was moved from Patrol Road when the Volkswagen plant was built and a new road system was engineered around the plant. The Sequoyah Road site was moved to Soddy Daisy High School.

Planning is integral to establishing or moving monitoring sites as the monitoring equipment must be evaluated, ordered, or moved from an existing site. The site must be selected after

studying available locations in the desired area, and it must be determined if the Bureau can obtain permission from the owner or lessor to use the property. The Air Monitoring Department usually goes to the Hamilton County GIS department to obtain maps to study. Then a site is selected. A site proposal must be submitted and formal permissions obtained from EPA before any work is actually done on the site. EPA prefers the proposal be submitted in the State of Tennessee Air Monitoring Plan, if at all possible. EPA will send a team composed of Region 4 (Atlanta) and Laboratory Services and Applied Science Division (Athens) employees, and they will determine if the site is appropriate. Once EPA approval is granted, then formal permissions, possibly with a contract drawn up with an attorney, must be acquired from the owner and/or lessor for use of the property. A foundation must be built and a module set in place with a crane if the instruments must be kept indoors. Power and telephone utilities and fencing must be arranged. A site move must be precisely planned to minimize data loss. Power and phone lines are run underground whenever possible.

A site move for particulate can be planned on a non-run day or a makeup can be done. Data will be lost on the continuous monitors for any down time. If there is a site move, the new site can be completed before the instruments are moved.

The memo *Managing Ozone Quality Assurance and Maintenance Activities while maintaining a complete day* states that the new ozone standard, as explained in *40 CFR Part 50 Appendix U*, only considers 8-hr averages between start time 0700 and 23:59 so taking a monitor off line for QC (calibrations annual PEs, NPAP, zero, span 1-point QC) or for maintenance purposes for as little as 3 consecutive hours can invalidate the entire day (rule requires 13-17 start hours with at least 6 of 8 hourly values available).

Planning is critical for preventing data loss as spare parts or equipment either must be readily available for substitution in the case of equipment failure or the ability to borrow equipment on short notice must be predetermined.

Data must be of the expected quality for their desired use. Data collection, in addition to quality and completion requirements, must be efficient and cost effective. The Bureau uses the *Guidance on Systematic Planning Using the Data Quality Objectives Process* EPA/240/B-06, QA-G4 (February 2006) (QA/G-4). Planning for quality data is done by implementing the approved Quality Assurance Project Plan (QAPP) for Chattanooga- Hamilton County. The plan was written using the EPA *Guidance for Quality Assurance Project Plans* (QA/G-5). The Bureau's Air Monitoring QAPP formally details the required data recovery, the quality parameters for acceptance of data, sampling methodology, sample storage, transport, chain of custody, and delivery and analytical methods.

Planning involves consistently evaluating program needs and modifying procedures to take advantage of new technologies. Suggested changes to the QAPP should be noted, evaluated, and the QAPP or an addendum should be resubmitted to EPA.

Planning with the contract PM_{2.5} lab, Inter-Mountain Labs (IML) of Sheridan, Wyoming, is critical for proper data handling and timely submittal of data to AQS. Downloaded operational data from the monitors must be submitted by the Bureau to IML in a timely manner to facilitate their processing of the filter data and the timely return of data to the Bureau. Communication with the lab is important for filter shipping and shipping of supplies. The IML Laboratory Manager

contacts an Air Monitoring Technician or the Air Monitoring Manager with any questions about the filters submitted to the lab. The Air Monitoring Manager evaluates the returned data from IML for quality before AQS submittal.

13.3. Engineering

The Engineering Manager supervises planning for his department for complaint investigations and permit writing. Each member of the Engineering staff must plan his or her annual full compliance evaluations so that every assigned facility is evaluated, and each staff member must plan inspections of every new installation so that every new installation is inspected. Engineering staff plan their own work schedules to ensure that complaint investigations and facility permits are completed in a timely manner. Planning is an important element of maintaining the Bureau's emissions inventory so that regulatory reporting requirements can be met.

Submission of the triennial Emissions Inventory requires planning because data submission may not be uneventful and time must be allowed for data rejection and resubmittal.

13.4. Planning for Burning Permits, Stage I Vapor Recovery, Dry Cleaners, and Asbestos

The Bureau Investigator must inspect potential burn sites in a timely manner in order to issue the permit. The Investigator plans his own schedule of inspections.

The Engineer inspects approximately 200 gasoline stations for the Stage I Vapor Recovery permitting program and about 6 dry cleaners for the Dry Cleaner permitting program. Work must be planned so that all required inspections occur each year for each of the two programs.

The Bureau Investigator, currently functioning as the Asbestos Coordinator, plans for the Asbestos Program. This procedure involves reviewing notifications, reviewing surveys, making sure payment is made, and writing the permit so that the project can start on time.

The Investigator sometimes must process a waiver of the 10 day notice permit. He must review the survey, perform an inspection if necessary, ensure fee prepayment, and prepare the permit in one or two days.

14. IMPLEMENTATION OF WORK PROCESSES

Documented work processes ensure that data collected are of the required quality for their desired use.

In the Air Monitoring Department, written Standard Operating Procedures (SOPs) are required to provide step-by-step directions for each work activity. SOPs must be updated with purchases of new equipment, regulatory changes, and analytical methodology changes. The Air Monitoring Manager is responsible for periodic updates of SOPs.

SOPs are written by the Air Monitoring Manager or Air Monitoring Technicians using monitoring manufacturer's literature, the *Guidance for Preparing Standard Operating Procedures (QA/G-6)*, and applicable regulatory requirements.

Air Monitoring must be performed according to *40 CFR, Parts 50 and 58* and associated appendices that refer to monitoring. The Air Monitoring Manager ensures that the SOPs are followed properly.

Emissions Inventory requirements are in *40 CFR, Part 51 Subpart A, Air Emissions Reporting Requirements*. Facility permitting is detailed under the *Chattanooga City Ordinance, Chapter 4, Air Pollution*, and in the Hamilton County and local municipalities' Air Pollution Control Regulations.

The Asbestos NESHAP permitting program refers to the permitting program which regulates the asbestos standards adopted by Chattanooga in the *City of Chattanooga Code, Chapter 4, Parts 4 and 17*; by Hamilton County in the *Hamilton County Air Pollution Control Regulations*; and incorporated in the other various local municipalities' codes within Hamilton County.

Any monitoring or lab operation that requires a procedure will have a written SOP. Any changes in procedures should be documented in a change to the SOP. SOPs are formally approved at the Bureau, then submitted to the Laboratory Services and Applied Science Division (LSASD) in Athens to be kept on file. They are to be submitted to an email address R4airqa@epa.gov that should supply a receipt. It is prudent to send a copy to several EPA employees of the LSASD to ensure that it is received. SOPs are stored in the Bureau laboratory on the bookcase.

15. ASSESSMENT AND RESPONSE

Chattanooga-Hamilton County will determine the effectiveness of the quality performance of the environmental programs to which the quality system applies. In a small agency the same people that are responsible for the data are assessing quality measures.

Assessment tools for Operations are financial audits, expenditure reports, and insurance evaluations. The Bureau equipment inventory should be evaluated yearly and items added or removed as required.

Every financial item processed by the Operations Department is reviewed by an employee in each of three departments of the City of Chattanooga: Accounting, Finance, and Purchasing. In addition, the City has its own independent auditing department, and Operations is subject to audits from the Auditing Department. If any issue is found in any of the department reviews or audits, the Operations Manager is notified immediately and the problem is remedied by the Operations Department.

Assessment tools for Air Monitoring are local audits, state audits, EPA audits, EPA technical systems reviews, review of downloads from Federal Reference Monitors, statistical analyses of regional data, evaluation of collocated data, evaluation of precision and span checks for

continuous gas monitors, and careful review of AMP data reports after data have been entered into AQS.

Assessment tools for Engineering are multiple employee reviews of draft permits, a thorough review of each facility's emissions' inventory, and stack tests, if needed, of a facility to confirm emissions.

An emissions test of a source may be required by a local or federal regulation (or may otherwise be deemed necessary by the Bureau Director) in order to determine if air pollutant emission limitations are being met or to establish required control equipment operating parameters. The conditions under which such a test is to be conducted are specified in a written emissions pretest agreement that is developed by Bureau permitting personnel with input from both the facility and the testing company. Permitting personnel observe the test to confirm that both test and process procedures are performed in accordance with the pretest agreement and to ensure that appropriate process parameters are recorded for each test run. Permitting personnel also verify the test results, including emission calculations, which are presented in a test report that is prepared by the testing company. Emissions data, based on the most recent valid emissions test for a source, is entered into the Bureau Emissions Inventory in place of any previous data.

As part of the evaluation of installation permit application packages, permitting personnel assess sources of air pollutant emissions, emission factors and emission equations that are available for each emission source. This is to ensure that the most accurate and appropriate data source is being used for each emitted pollutant.

Emissions are constantly assessed in the EI to assure that actual annual emissions from individual sources are not underreported in the inventory. For example, PM_{10} emissions from a source cannot be less than $PM_{2.5}$ emissions from that source, and VOC emissions from a source cannot be less than the sum of all of the source's volatile organic HAP emissions, excluding non-VOC HAPS (e.g., methylene chloride and perchloroethylene). Permitting personnel and the Manager verify that such emissions are not over-reported by (1) substantiating the use of actual rather than potential operating hours and, in the case of fuel combustion equipment, (2) substantiating the use of average heat inputs or actual fuel usages rather than rated heat input capacities.

The inventory is reviewed for reasonableness in much the same way as the monitoring data is reviewed.

Bureau employees should:

Assess the adequacy of the quality system annually

Managers in each department and employees responsible for each permitting program will be responsible for their own annual quality assessment. There is no one entity at the Bureau that reviews every department annually for quality assessment.

Report air monitoring assessment results to management

- Internal audits conducted by a Bureau auditor are entered into AQS.
- The State of Tennessee normally audits all instruments quarterly and sends a formal report to the Director, the Air Monitoring Manager, and copies to State managers. They are entered into AQS.
- EPA NPAP and PEP audit reports are provided to the Air Monitoring Manager. EPA or an EPA contractor loads the data into AQS.
- EPA has an exit meeting for a TSA where EPA auditors review the findings and suggestions. EPA follows up with a formal written report to the Director that may require a response and corrective actions. EPA does not physically audit the instruments while they are here, they audit the program and the data.
- A contract auditor hired by the Bureau will provide a formal report with all the findings and their auditing instrument NIST traceable certificates. The results will be entered into AQS. AMP reports can be run from AQS for a complete list of all types of air monitoring audits.

Ensure that personnel conducting assessments are technically knowledgeable

- Local Bureau employee auditors should be thoroughly trained to use the auditing equipment. The Air Monitoring Manager is usually the local auditor. A technician may be asked to audit equipment for which he or she is not directly responsible.
- State auditors should be trained and have some proof of training.
- Third party contract auditors should be able to provide proof the auditor has performed many past audits and that auditors have training. EPA has a PEP/ NPAP class that auditors can attend. A third party auditor should be able to provide client references.

Document

- All audits (except for possibly a contract audit) are recorded in the instrument bound log book at the site.
- All audits are recorded in the 8872 Logger electronic Log or in the 8832 Messages to Central.
- All bound log books are copied quarterly and a copy is kept at the Bureau.
- All continuous audit graphs are reviewed and saved electronically.
- A formal report is sent to the Bureau by the contractor for a contract audit.
- All audits are loaded into AQS unless there is some qualified reason that the audit is invalid

Identify corrective actions, ensure they are made promptly, confirm the effectiveness, and determine whether the problem is unique or has more generic implications

If any issue is found in an audit, corrective actions will be proposed and will be expected to be enacted promptly. If the corrective action cannot be enacted promptly, such as purchasing expensive equipment, a plan will be developed for corrective action over a period of time. After a TSA the Bureau will receive a letter detailing the corrective actions that EPA expects, and EPA will anticipate a letter in return explaining how the corrective actions were implemented.

The letter may propose a plan for implementation if immediate corrective actions are not feasible.

If the problem could affect more than one agency, such as an equipment malfunction or a defective part, EPA should be notified and either Region 4 (Atlanta) or the Laboratory Services and Applied Science Division (Athens) will send information to all the Region 4 agencies.

Address any disputes encountered as a result of the assessment

On rare occasions there are audits where the technician responsible for the instrument disputes the auditor's audit findings. In this case the technician audits the same equipment with his own Bureau auditing devices while the outside auditor is present. If the dispute cannot be resolved between the two auditors, the Air Monitoring Manager is called to the site. A determination will be made whether the audit was valid or should be re-performed with other auditing equipment. The dispute must be settled while the outside auditor is present. It is almost impossible to resolve the disagreement at a later date.

16. QUALITY IMPROVEMENT

The Bureau must continually improve the organization's quality system. Bureau employees are encouraged to communicate concerns, to identify process improvement opportunities, and to offer solutions to problems. Quality issues should be addressed and corrected promptly to prevent reoccurrence.

The quality system for the entire Bureau is evaluated by the individual managers and the Bureau Director. The departments are so highly specialized in a small agency that each department does not have the expertise to evaluate another department.

The Operations Manager is responsible for quality improvements in the Operations Department. New procedures for accounting, procurement, and human resources are often adopted with a change in political climate. This may require more frequent policy changes than policy changes in other departments of the Bureau. New policies are adopted by a new local political administration with the goal of improving quality and efficiency. There can also be changes in operational procedures with changes in the national political climate or with changes in EPA personnel.

The Air Monitoring Manager is responsible for the quality of the data and any policies or improvements in quality management relating to data. The Manager is responsible for knowing changes in the monitoring regulations that apply to quality and ensuring those are adopted into the monitoring program. There must be an avenue of communication with EPA employees at Region 4 in Atlanta and at the Laboratory Services and Applied Science Division in Athens. Those relationships are integral to quality assessment and improvement.

The Air Monitoring Manager is responsible, as well, for familiarity with new technologies for air monitoring and for adopting the new technologies that are appropriate and financially feasible. New technologies can improve data quality by being more accurate or functioning with less mechanical issues or fewer man hours.

The monitoring community has been transitioning from analog to digital as new equipment has been purchased. Some agencies have also been adopting wireless and internet technology. The technology has to be evaluated from a financial feasibility standpoint, and it must be determined if the benefits outweigh the additional cost.

Air Monitoring SOPs and quality assurance documents must be constantly updated to reflect actual operations at the Bureau.

Quality assurance improvements in Air Monitoring may be made in response to an EPA TSA, a state audit, or some other audit if it is determined that current QA procedures should be upgraded. In the past, state and EPA auditors in their visits have made suggestions for improvement that have been adopted as procedures. Since the auditors travel to multiple agencies, the auditor may see some QA procedure adopted at another agency that he or she believes would benefit the Bureau. Tennessee agencies' air monitoring departments currently have more communication than in the past. This has benefited QA procedures as agencies share information about how their quality assurance programs are conducted.

The Engineering Department is responsible for the quality of the emissions data. This emissions data is thoroughly evaluated industry by industry every three years before submission to make sure that correct data is being submitted. The Engineering Department is also responsible for the accuracy and timeliness of the industrial permits and new installation permits. The Engineering Manager must stay abreast of new federal regulations. Communication within the department is critical as the department considers shared knowledge to be valuable.

The submission, EPA review, and resubmission process for the Air Monitoring QAPP ensures that EPA notes deficiencies in the Quality Program and suggests or requires improvements. For the Air Monitoring QAPP, in the five years between submissions, a list is kept of minor changes and they are incorporated into a major update submission. Resubmissions are unnecessary for every minor update.

The Air Monitoring Manager, Air Monitoring Technicians, the Engineering Manager, and Engineering staff should attend conferences and training to be introduced to new technology. Bureau Air Monitoring personnel must keep abreast of technological advances in monitoring, data acquisition, and data handling as those technologies have been changing rapidly in the last few years. Bureau Engineering personnel must keep abreast of technological advances in pollution reduction equipment and advances in industrial processes, especially advances in industrial facilities that are in Hamilton County.

Quality improvement for the individual permitting programs (Burn Permits, Stage I Vapor Recovery, Dry Cleaner, and Asbestos NSHAP) are evaluated yearly by the Bureau employee responsible for each program and the Director. The employees operating these programs must be familiar with the local ordinance under which they are operating. Any suggestions for improvement should be presented to the Director for approval before implementation.

16.1. Procedure to Correct Errors:

The department manager will be notified immediately when an error is discovered in a department and the error will be corrected.

The Operations Manager and Assistant are responsible for the Bureau budget and finances. If an error is discovered in the budget planning or financial handling, the error will be corrected and the Director will be informed.

The Operations Manager will be notified by employees immediately if there is an issue with a fleet vehicle. The vehicle is taken to the City Garage by the Air Monitoring Department employees for evaluation, and the repair quote is approved by the Director before the work is performed. The Operations Manager is to be notified if there is a problem with the physical facility, and he/she will contact the Hamilton County building management for a correction.

The Air Monitoring Manager will be notified by the Air Monitoring Technician if a monitor is malfunctioning or if there is an issue with air quality data. If there is a malfunctioning monitor, parts will be ordered and the monitor will be repaired immediately. If new parts do not resolve the problem, the whole monitor will be sent to the company and a substitute will be put in its place. If the error is with data in AQS, the Air Monitoring Manager will determine, using data studies, if there is an error in AQS and will correct the error in AQS. If the Air Monitoring Manager determines that an error in AQS is caused by a calculation controlled by EPA, the manager will immediately contact a responsible party at EPA to make EPA aware of the error and EPA can make the necessary changes to AQS to make the data correct.

If monitoring data already loaded in AQS appears questionable upon review, detailed regional data comparisons and statistical studies will be conducted to determine if the data should be flagged or voided. Data that is statistically close to other sites regionally can be retained and flagged if there is an issue that is determined to not be critical. Data that is determined to be incorrect or is not meeting critical criteria parameters for the specific pollutant may be voided. Any data under consideration to be flagged or voided prompts an investigation into why the issue happened. Reasons for flags or voids will be documented in log books at monitoring sites, in the PM_{2.5} log in the lab, and in any other location where that data might appear.

The permits from the Engineering Department are first reviewed for errors or suggested corrections by the Engineering Manager, then by the Bureau Director. Any changes are made immediately.

16.2. Propose a Resolution

When the department manager is notified that a problem that requires corrective actions has occurred, the employee should outline to the manager why the problem occurred and suggest a course of action to correct the problem. There should be a proposed time-line for the correction.

The timeframe for completion of corrective actions is relative to the problem. For example in air monitoring, one failing monitor might be easily fixed by installing a part kept in stock. That

monitor can have an issue identified and resolved in one day. On the other hand, a monitor that is malfunctioning and for which there are no stocked parts (usually expensive parts) may have to wait on a part or the monitor may be shipped to the vendor for repairs. In that case, the resolution may take weeks or months. Thus, the timeframe for corrective actions would be completely different. In the event the proposed timeframe for repairs would cause a data loss, a spare ozone monitor, a 49C, can be placed into service. The Bureau has a spare PM_{2.5} monitor to put in place if repair time is lengthy. There should be minimal data loss for a malfunctioning monitor because spares are available.

If the error is in a permitting program, the responsible party for the permitting program is contacted and the error will be immediately addressed.

16.3. Implementation Plan

If the department manager agrees with the proposed remedy, the employee will implement the suggested resolution to the problem and document the outcome.

Any financial irregularity in the Operations Department will be investigated, documented, and resolved immediately. Any issue with a fleet vehicle will result in the vehicle being taken to the City Garage/ Fleet Services for repairs. Any personnel issue will be resolved with input from the Director.

After the Air Monitoring Technician notifies the Air Monitoring Manager that a problem with an instrument has been corrected, the Air Monitoring Manager will immediately verify that the instrument has been returned to working order by reviewing data, running audits, and performing data analyses against regional monitors. If the Air Monitoring Manager is not satisfied that the problem has been corrected, a new corrective action will be formulated and enacted. The Air Monitoring Manager will, again, verify that the problem has been resolved. This process continues, as quickly as possible to minimize data loss, until the problem is corrected.

Corrective actions for monitoring equipment are verified by calibrations, precision checks, flow checks, and supervisor and/or state audits. The problem is considered corrected if an ozone monitor passes leak checks, span checks, precision checks, and audits. The problem is considered corrected for a PM_{2.5} FRM monitor if the monitor passes flow checks, leaks checks, and audits. Flow checks, leak checks, and audits are also appropriate to determine effectiveness of corrective actions for the continuous PM_{2.5} monitor. Repeated flow checks should be performed on PM_{2.5} FRM monitors if flow is part of the issue. The problem resolution is not considered confirmed on those monitors until it is determined that the flow is not drifting.

16.4. Process for Continuous Improvement

The Operations Manager and the Director attend the Region 4 Grants and Planning Meeting every year.

The Engineering Manager attends modeling workshops and technical conferences.

Attendance at Region 4 Technical Workshop, the National Air Monitoring Workshop, and AQS Conferences enables Air Monitoring employees to have current technical expertise required for improving data quality and data completion requirements.

Engineering personnel attendance at AFS Conferences and other technical conferences enables Engineering staff to be current on emissions inventory quality requirements.

Training is important for continual improvement in the Air Monitoring and Engineering Programs. Engineering personnel, the Bureau Investigator, and air monitoring technicians attend smoke school twice a year to maintain accreditation for reading the opacity of both white and black smoke.

Continual review and updates of SOPs and QAPPs provide for ongoing improvement to the Air Monitoring Program. Routine Local and State audits identify areas for improvement.

The Asbestos Coordinator may be sent to training classes. He or she attends the Southeastern regional meeting (SESAC) each year.

17. REFERENCES

Chattanooga-Hamilton County Ozone Thermo Environmental 49i and 49iP (Calibrator)
SOP

Chattanooga-Hamilton County PM_{2.5} FRM R & P SOP

Chattanooga-Hamilton County Data Handling SOP

State of Tennessee QMP 2011 Chattanooga-
Hamilton County QMP 2012

State of Tennessee Monitoring Plan 2016

State of Tennessee QMP 2016

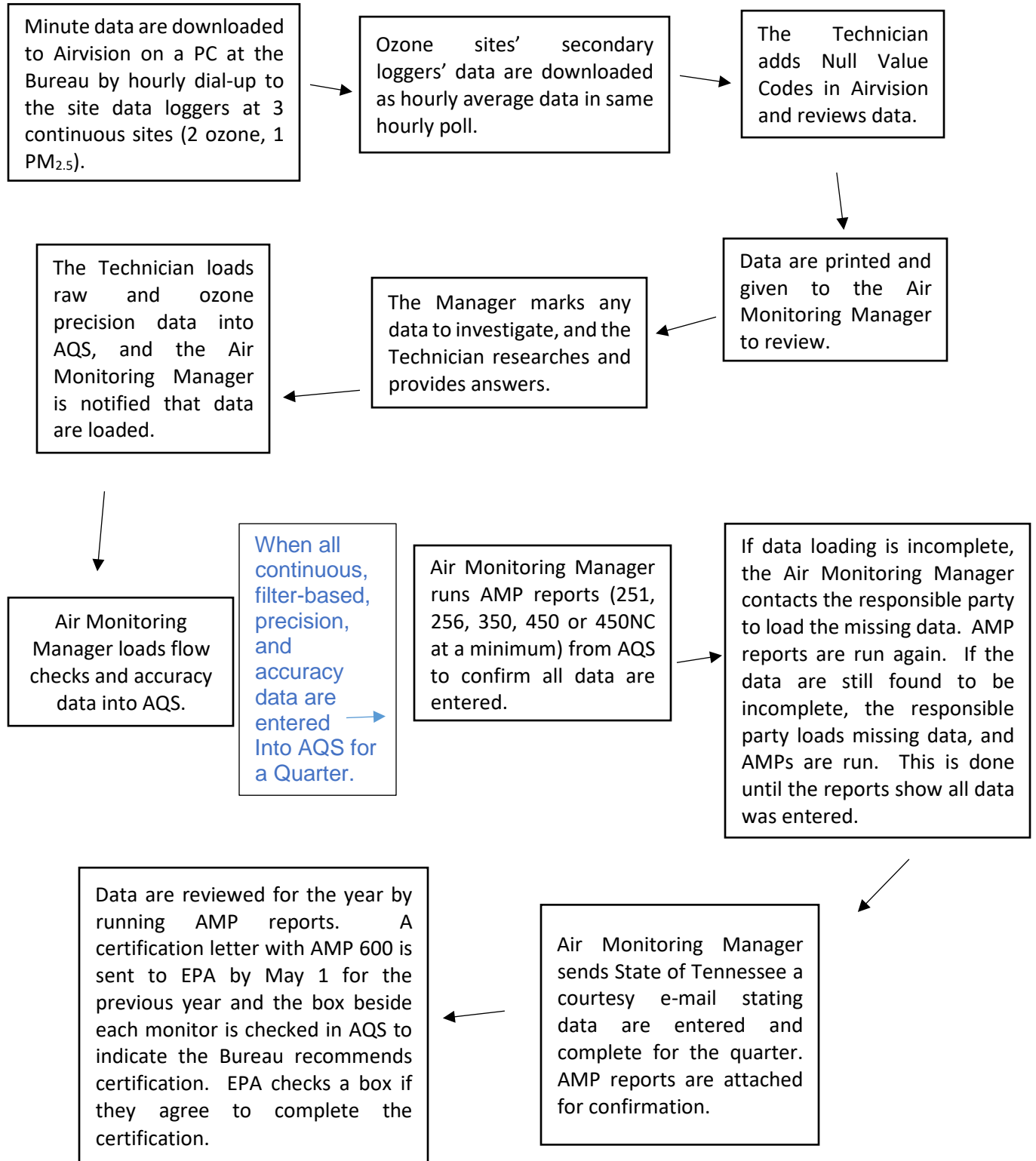
List of Designate Reference and Equivalent Methods June 17, 2017

Quality Assurance Guidance Document 2.12: Monitoring PM_{2.5} in Ambient Air
Using Designated Reference or Class I Equivalent Methods, January
2016

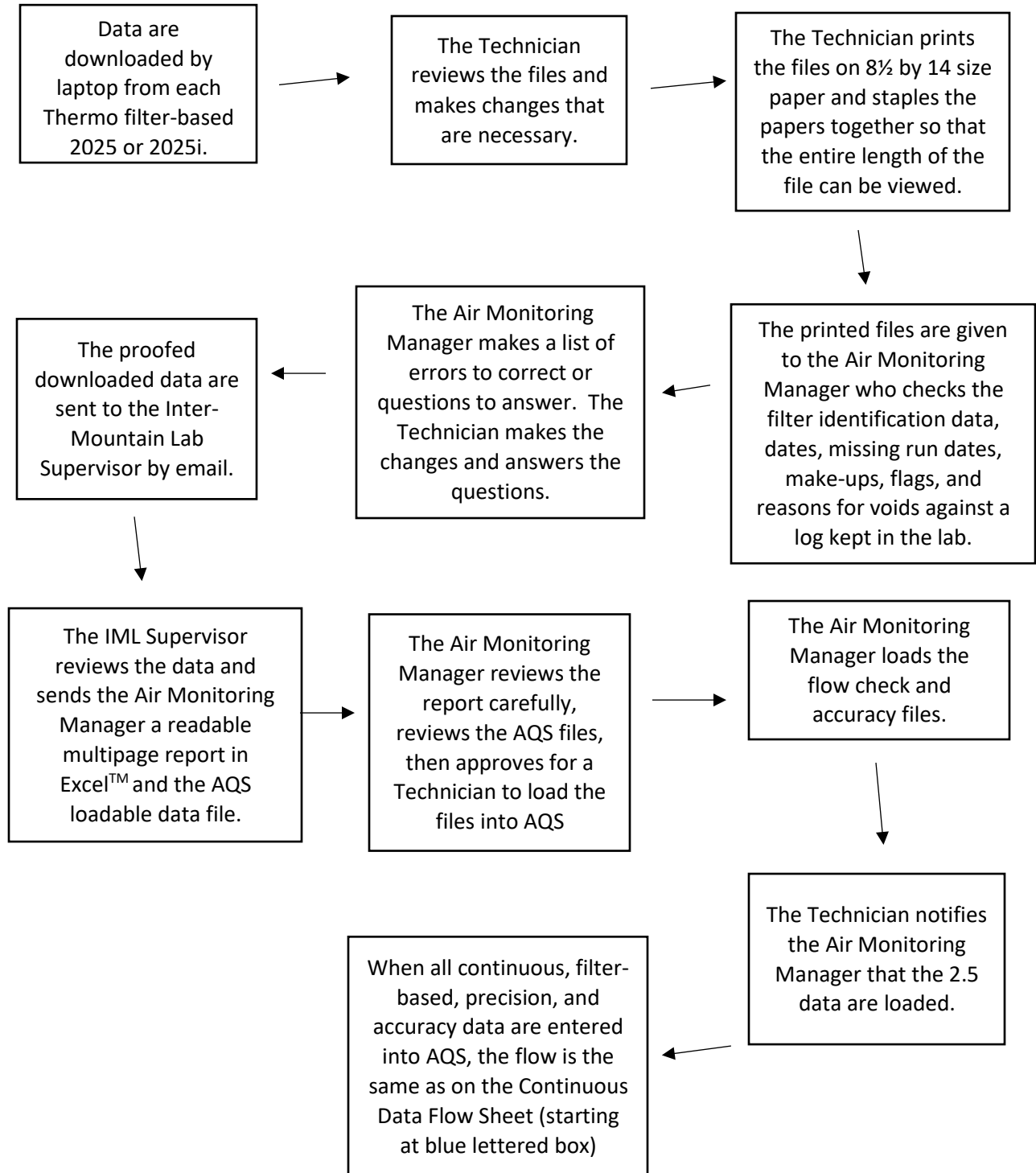
*Quality Assurance Project Plan for Laboratory and Data Management Support of the
Determination of Fine Particulate Matter as PM_{2.5} and Coarse Particulate Matter as
PM_{10-2.5} in the Atmosphere (Current version: March 2017, Revision 14).*

Appendix A Data Flow Charts

Flow of Continuous Data



Flow of Filter-based FRM Data



Appendix B

Memorandum of Agreement with State of Georgia

MEMORANDUM OF AGREEMENT

ON AIR QUALITY MONITORING FOR CRITERIA POLLUTANTS FOR

THE CHATTANOOGA-WALKER COUNTY

METROPOLITAN STATISTICAL AREA MSA

December 28, 2017

Participating Agencies:

Georgia

Georgia Department of Natural Resources (GA DNR)
Environmental Protection Division GA EPD APB

Tennessee

Chattanooga-Hamilton County Air Pollution Control Bureau (CHCAPCB)

I. PURPOSE/OBJECTIVES/GOALS

The purpose of the Memorandum of Agreement (MOA) is to establish the Chattanooga-Hamilton County-Walker County Metropolitan Statistical Area (MSA) Criteria Pollutant Air Quality Monitoring Agreement between CHCAPCB and GAEPDAPB (collectively referred to as the "affected agencies") to collectively meet United States Environmental Protection Agency (EPA) minimum monitoring requirements for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone; as well as other criteria pollutant air quality monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all parties. This MOA will establish the terms and conditions of this collective agreement to provide adequate criteria pollutant monitoring for the Chattanooga-Hamilton County-Walker Co, GA MSA as required by 40 CFR 58 Appendix D, Section 2, (e) (March 28, 2016)¹.

II. BACKGROUND

The Chattanooga-Hamilton Co-Walker Co, GA MSA consists of the following counties: Dade, Walker, Catoosa, Hamilton, Marion, and Sequatchie. GA EPD APB has jurisdiction over Dade, Walker, and Catoosa Counties in Georgia and CHCAPCB has jurisdiction over Hamilton County, Tennessee. The State of Tennessee has jurisdiction over Marion and Sequatchie Counties in Tennessee, but does not have any permanent air monitoring sites in those counties. The CHCAPCB and GA EPD APB are required by the Clean Air Act to measure for certain criteria pollutants in the ambient air in the Chattanooga-Hamilton County-Walker Co, GA Metropolitan Statistical Area (MSA). The United States Environmental Protection Agency (EPA) has established minimum monitoring requirements based on the size of the MSA and the quality of the air in the

MSA for particles of an aerodynamic diameter of 10 micrometers and less (PM10), particles of an aerodynamic diameter of 2.5 micrometers and less (PM2.5), and ozone.

40 CFR 58 Appendix D, Section 2, (e)¹ states (in part):

“...The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.”¹

Currently each air pollution control agency (affected agency) conducts monitoring in its respective jurisdiction and coordinates its monitoring with the other air pollution control agencies within the MSA.

I. ROLES AND RESPONSIBILITIES

The parties agree to the following terms and conditions:

- CHCAPCB and GA EPD APB (the “affected agencies”) commit to conducting appropriate monitoring in their respective jurisdictions of the MSA; as needed, to collectively meet EPA minimum monitoring requirements for the entire MSA for PM10, PM2.5, and ozone, as well as other criteria air pollutant monitoring deemed necessary to meet the needs of the MSA as determined reasonable by all affected agencies. The minimum air quality monitoring requirement (for PM10, PM2.5, and ozone described in 40 CFR 58) for the MSA shall apply to the MSA in its entirety and shall not apply to any sole affected agency within the MSA unless agreed upon by all affected agencies.
- The affected agencies commit to coordinating monitoring “...responsibilities and requirements...to achieve an effective network design...”¹ regarding criteria air pollutant monitoring conducted in the MSA and commit to communicate unexpected or unplanned changes in monitoring activities within their jurisdictions to the other affected agencies of this MOA. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agencies via telephone or e-mail of any monitoring changes occurring in its jurisdiction of the MSA at its earliest convenience after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to natural disasters, or similar occurrences that result in a loss of more than 25% data in a quarter or a permanent change in the monitoring network. At least once a year in the second quarter of the year or before June 15th, each agency shall make available to the other agencies who are a party to this agreement, a copy of its proposed monitoring plan for the MSA for the next

year. The CHCAPCB will submit the network review that is submitted to the State of Tennessee for inclusion in the State's monitoring plan.

- Each party reserves the right to revoke or terminate this MOA at any time and for any reason by giving thirty (30) days written notice prior to the date of termination.

III. LIMITATIONS

- A. All commitments made in this MOA are subject to the availability of appropriated funds and each party's budget priorities. Nothing in this MOA, in and of itself, obligates CHCAPCB or GA EPD APB to expend appropriations or to enter into any contract, assistance agreement, interagency agreement or other financial obligation.

- B. This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimburse or contribution of funds between parties to this MOA will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate subsidiary agreements that will be effected in writing by representatives of the parties.

- C. Except as provided in Section III, this MOA does not create any right or benefit, substantive or procedural, enforceable by law or equity against CHCAPCB or GA EPD APB, their officers or employees, or any other person. This MOA does not direct or apply to any person outside CHAPCD or GAEPD APB.

V. PROPRIETARY INFORMATION AND INTELLECTUAL PROPERTY

No proprietary information or intellectual property is anticipated to arise out of this MOA.

VI. POINTS OF CONTACT

The following individuals are designated points of contact for the MOA:

GA EPD APB DeAnna G. Oser
GAEPD APB Ambient Monitoring Program
4244 International Parkway, Suite 120
Atlanta, GA 30354

DeAnna.Oser@dnr.ga.gov

Voice: (404) 363-7004

FAX: (404) 363-7100

CHCAPCB Robert Colby
CHCAPCB
6125 Preservation Dr
Chattanooga, Tn 37416

rcolby@chattanooga.gov

Voice: (423) 643-5999

FAX: (423) 643-5972

VII. MODIFICATION/DURATION/TERMINATION


This MOA will be effective when signed by all parties. This MOA may be amended at any time by the mutual written consent of the parties. The parties will review this MOA at least once every 10 years to determine whether it should be revised, renewed, or cancelled. This MOA may be revoked or terminated by an affected agency at any time and for any reason by giving thirty (30) days written notice prior to the date of termination.

VIII. REFERENCE


1 – United States Environmental Protection Agency, Title 40 Code of Federal Regulations, Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 2 (e), “General Monitoring Requirements”.

IX. APPROVALS

**Georgia Department of Natural Resources, Environmental Protection Division
Air Protection Branch (GA EPD APB)**

BY: 
TITLE: DIRECTOR
DATE: 1/24/18

Chattanooga-Hamilton County Air Pollution Bureau (CHCAPCB)

BY: 
TITLE: Director
DATE: January 3, 2018